PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Niles Miller 20T-301**

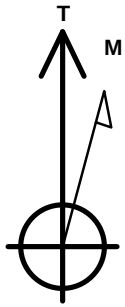
Surface Location: Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4955.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1317940.66	3197036.39	40.203993	-104.794567	

Original Well Elev WELL @ 4968.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 319'FSL, 829'FEL	1.0	0.0	0.0	Point
BHL 500'FNL, 1340'FEL	7267.0	4443.5	-551.1	Point
WP (20T-301)	7277.7	3750.0	-590.0	Point



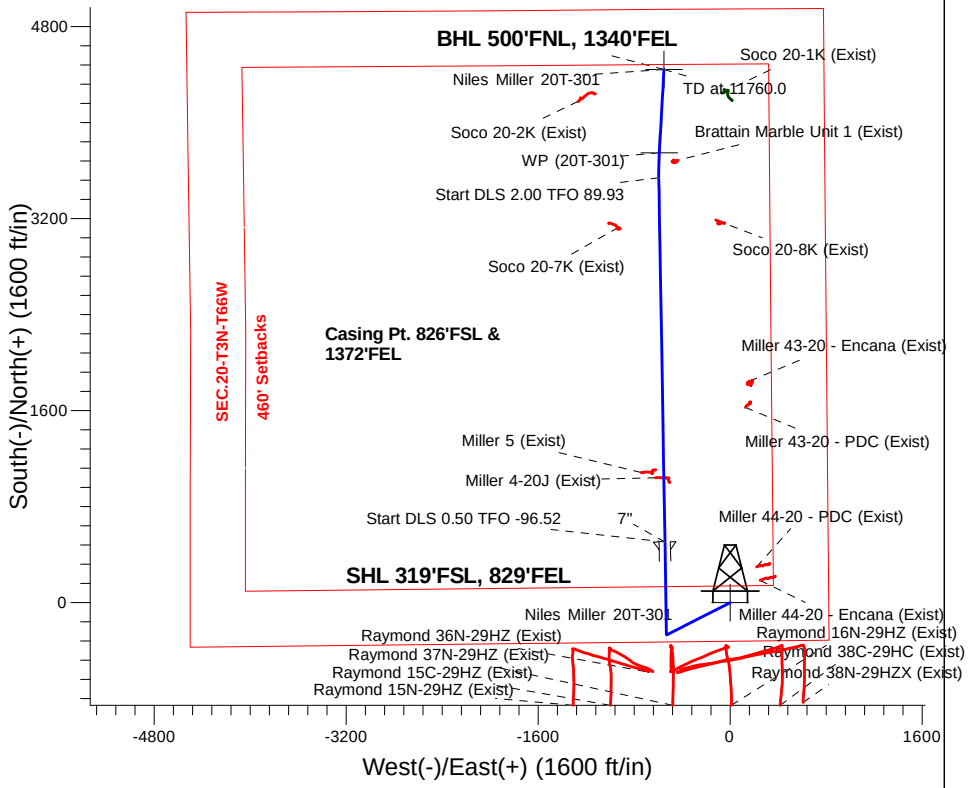
Azimuths to True North
Magnetic North: 8.24°

Magnetic Field
Strength: 52535.5snT
Dip Angle: 66.73°
Date: 2/5/2016
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	KOP - Start Build 1.50
4540.9	4584.5	Start Drop -2.00
6563.7	6609.3	KOP #2 - Start Build 7.50
7327.5	7821.2	Start DLS 0.50 TFO -96.52
7280.9	10856.4	Start DLS 2.00 TFO 89.93
7267.0	11760.0	TD at 11760.0

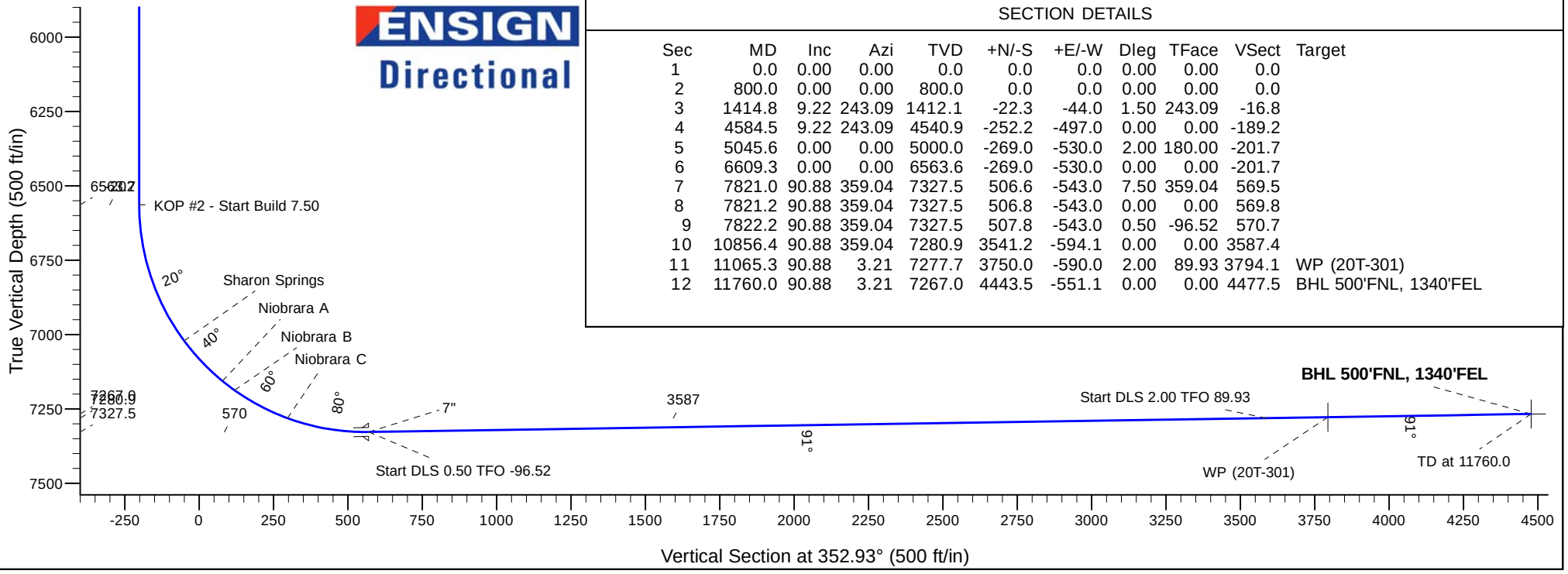
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20T-301
Plan #2 (2-5-16)
16:03, February 08 2016



ENSIGN Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1414.8	9.22	243.09	1412.1	-22.3	-44.0	1.50	243.09	-16.8	
4	4584.5	9.22	243.09	4540.9	-252.2	-497.0	0.00	0.00	-189.2	
5	5045.6	0.00	0.00	5000.0	-269.0	-530.0	2.00	180.00	-201.7	
6	6609.3	0.00	0.00	6563.6	-269.0	-530.0	0.00	0.00	-201.7	
7	7821.0	90.88	359.04	7327.5	506.6	-543.0	7.50	359.04	569.5	
8	7821.2	90.88	359.04	7327.5	506.8	-543.0	0.00	0.00	569.8	
9	7822.2	90.88	359.04	7327.5	507.8	-543.0	0.50	-96.52	570.7	
10	10856.4	90.88	359.04	7280.9	3541.2	-594.1	0.00	0.00	3587.4	
11	11065.3	90.88	3.21	7277.7	3750.0	-590.0	2.00	89.93	3794.1	WP (20T-301)
12	11760.0	90.88	3.21	7267.0	4443.5	-551.1	0.00	0.00	4477.5	BHL 500'FNL, 1340'FEL



ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20T-301

Wellbore #1

Plan: Plan #2 (2-5-16)

Standard Planning Report

08 February, 2016

PDC ENERGY
Growing E&P Value

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-5-16)		

Project	SEC.20-T3N-R66W, Weld County, Colorado		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W				
Site Position:		**Northing:**	1,317,895.72 usft	**Latitude:**	40.203869
From:	Lat/Long	**Easting:**	3,197,037.36 usft	**Longitude:**	-104.794565
Position Uncertainty:	0.0 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.46 °

Well	Niles Miller 20T-301					
Well Position	**+N/-S**	44.9 ft	**Northing:**	1,317,940.66 usft	**Latitude:**	40.203993
	+E/-W	-0.6 ft	**Easting:**	3,197,036.39 usft	**Longitude:**	-104.794567
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	4,955.0 ft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	2/5/2016	8.24	66.73	52,535

Design	Plan #2 (2-5-16)				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.0	0.0	0.0	352.93	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,414.8	9.22	243.09	1,412.1	-22.3	-44.0	1.50	1.50	0.00	243.09	
4,584.5	9.22	243.09	4,540.9	-252.2	-497.0	0.00	0.00	0.00	0.00	
5,045.6	0.00	0.00	5,000.0	-269.0	-530.0	2.00	-2.00	0.00	180.00	
6,609.3	0.00	0.00	6,563.6	-269.0	-530.0	0.00	0.00	0.00	0.00	
7,821.0	90.88	359.04	7,327.5	506.6	-543.0	7.50	7.50	0.00	359.04	
7,821.2	90.88	359.04	7,327.5	506.8	-543.0	0.00	0.00	0.00	0.00	
7,822.2	90.88	359.04	7,327.5	507.8	-543.0	0.50	-0.06	-0.50	-96.52	
10,856.4	90.88	359.04	7,280.9	3,541.2	-594.1	0.00	0.00	0.00	0.00	
11,065.3	90.88	3.21	7,277.7	3,750.0	-590.0	2.00	0.00	2.00	89.93	WP (20T-301)
11,760.0	90.88	3.21	7,267.0	4,443.5	-551.1	0.00	0.00	0.00	0.00	BHL 500'FNL, 1340'F

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
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Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-5-16)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 319'FSL, 829'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
900.0	1.50	243.09	900.0	-0.6	-1.2	-0.4	1.50	1.50	0.00
1,000.0	3.00	243.09	999.9	-2.4	-4.7	-1.8	1.50	1.50	0.00
1,100.0	4.50	243.09	1,099.7	-5.3	-10.5	-4.0	1.50	1.50	0.00
1,200.0	6.00	243.09	1,199.3	-9.5	-18.7	-7.1	1.50	1.50	0.00
1,300.0	7.50	243.09	1,298.6	-14.8	-29.1	-11.1	1.50	1.50	0.00
1,400.0	9.00	243.09	1,397.5	-21.3	-41.9	-16.0	1.50	1.50	0.00
1,414.8	9.22	243.09	1,412.1	-22.3	-44.0	-16.8	1.50	1.50	0.00
1,500.0	9.22	243.09	1,496.2	-28.5	-56.2	-21.4	0.00	0.00	0.00
1,600.0	9.22	243.09	1,595.0	-35.8	-70.5	-26.8	0.00	0.00	0.00
1,700.0	9.22	243.09	1,693.7	-43.0	-84.8	-32.3	0.00	0.00	0.00
1,800.0	9.22	243.09	1,792.4	-50.3	-99.1	-37.7	0.00	0.00	0.00
1,900.0	9.22	243.09	1,891.1	-57.5	-113.4	-43.1	0.00	0.00	0.00
2,000.0	9.22	243.09	1,989.8	-64.8	-127.7	-48.6	0.00	0.00	0.00
2,100.0	9.22	243.09	2,088.5	-72.0	-141.9	-54.0	0.00	0.00	0.00
2,200.0	9.22	243.09	2,187.2	-79.3	-156.2	-59.5	0.00	0.00	0.00
2,300.0	9.22	243.09	2,285.9	-86.5	-170.5	-64.9	0.00	0.00	0.00
2,400.0	9.22	243.09	2,384.6	-93.8	-184.8	-70.3	0.00	0.00	0.00
2,500.0	9.22	243.09	2,483.3	-101.1	-199.1	-75.8	0.00	0.00	0.00
2,600.0	9.22	243.09	2,582.0	-108.3	-213.4	-81.2	0.00	0.00	0.00
2,700.0	9.22	243.09	2,680.7	-115.6	-227.7	-86.7	0.00	0.00	0.00
2,800.0	9.22	243.09	2,779.4	-122.8	-242.0	-92.1	0.00	0.00	0.00
2,900.0	9.22	243.09	2,878.2	-130.1	-256.3	-97.5	0.00	0.00	0.00
3,000.0	9.22	243.09	2,976.9	-137.3	-270.6	-103.0	0.00	0.00	0.00
3,100.0	9.22	243.09	3,075.6	-144.6	-284.8	-108.4	0.00	0.00	0.00
3,200.0	9.22	243.09	3,174.3	-151.8	-299.1	-113.9	0.00	0.00	0.00
3,300.0	9.22	243.09	3,273.0	-159.1	-313.4	-119.3	0.00	0.00	0.00
3,400.0	9.22	243.09	3,371.7	-166.3	-327.7	-124.7	0.00	0.00	0.00
3,500.0	9.22	243.09	3,470.4	-173.6	-342.0	-130.2	0.00	0.00	0.00
3,600.0	9.22	243.09	3,569.1	-180.8	-356.3	-135.6	0.00	0.00	0.00
3,700.0	9.22	243.09	3,667.8	-188.1	-370.6	-141.1	0.00	0.00	0.00
3,800.0	9.22	243.09	3,766.5	-195.3	-384.9	-146.5	0.00	0.00	0.00
3,900.0	9.22	243.09	3,865.2	-202.6	-399.2	-151.9	0.00	0.00	0.00
3,965.6	9.22	243.09	3,930.0	-207.4	-408.5	-155.5	0.00	0.00	0.00
Parkman									
4,000.0	9.22	243.09	3,963.9	-209.8	-413.5	-157.4	0.00	0.00	0.00
4,100.0	9.22	243.09	4,062.6	-217.1	-427.7	-162.8	0.00	0.00	0.00
4,200.0	9.22	243.09	4,161.4	-224.4	-442.0	-168.2	0.00	0.00	0.00
4,300.0	9.22	243.09	4,260.1	-231.6	-456.3	-173.7	0.00	0.00	0.00
4,400.0	9.22	243.09	4,358.8	-238.9	-470.6	-179.1	0.00	0.00	0.00
4,426.6	9.22	243.09	4,385.0	-240.8	-474.4	-180.6	0.00	0.00	0.00

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Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-5-16)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Sussex									
4,500.0	9.22	243.09	4,457.5	-246.1	-484.9	-184.6	0.00	0.00	0.00
4,584.5	9.22	243.09	4,540.9	-252.2	-497.0	-189.2	0.00	0.00	0.00
Start Drop -2.00									
4,600.0	8.91	243.09	4,556.2	-253.3	-499.2	-190.0	2.00	-2.00	0.00
4,700.0	6.91	243.09	4,655.2	-259.6	-511.4	-194.7	2.00	-2.00	0.00
4,800.0	4.91	243.09	4,754.7	-264.2	-520.6	-198.2	2.00	-2.00	0.00
4,900.0	2.91	243.09	4,854.5	-267.3	-526.7	-200.5	2.00	-2.00	0.00
5,000.0	0.91	243.09	4,954.4	-268.8	-529.7	-201.6	2.00	-2.00	0.00
5,005.6	0.80	243.09	4,960.0	-268.9	-529.8	-201.6	2.00	-2.00	0.00
Shannon									
5,045.6	0.00	0.00	5,000.0	-269.0	-530.0	-201.7	2.00	-2.00	0.00
5,100.0	0.00	0.00	5,054.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,200.0	0.00	0.00	5,154.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,300.0	0.00	0.00	5,254.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,400.0	0.00	0.00	5,354.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,500.0	0.00	0.00	5,454.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,554.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,700.0	0.00	0.00	5,654.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,754.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,854.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,954.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,100.0	0.00	0.00	6,054.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,200.0	0.00	0.00	6,154.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,254.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,354.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,454.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,554.4	-269.0	-530.0	-201.7	0.00	0.00	0.00
6,609.3	0.00	0.00	6,563.7	-269.0	-530.0	-201.7	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,700.0	6.81	359.04	6,654.2	-263.6	-530.1	-196.4	7.50	7.50	0.00
6,800.0	14.31	359.04	6,752.4	-245.3	-530.4	-178.2	7.50	7.50	0.00
6,900.0	21.81	359.04	6,847.4	-214.3	-530.9	-147.4	7.50	7.50	0.00
7,000.0	29.31	359.04	6,937.6	-171.2	-531.6	-104.5	7.50	7.50	0.00
7,099.6	36.77	359.04	7,021.0	-117.0	-532.5	-50.6	7.50	7.50	0.00
Sharon Springs									
7,100.0	36.81	359.04	7,021.3	-116.7	-532.6	-50.3	7.50	7.50	0.00
7,200.0	44.31	359.04	7,097.3	-51.8	-533.6	14.3	7.50	7.50	0.00
7,287.1	50.84	359.04	7,156.0	12.5	-534.7	78.2	7.50	7.50	0.00
Niobrara A									
7,300.0	51.81	359.04	7,164.0	22.5	-534.9	88.2	7.50	7.50	0.00
7,338.4	54.68	359.04	7,187.0	53.3	-535.4	118.7	7.50	7.50	0.00
Niobrara B									
7,400.0	59.31	359.04	7,220.6	104.9	-536.3	170.1	7.50	7.50	0.00
7,500.0	66.81	359.04	7,265.8	194.0	-537.8	258.7	7.50	7.50	0.00
7,541.1	69.89	359.04	7,281.0	232.2	-538.4	296.7	7.50	7.50	0.00
Niobrara C									
7,600.0	74.31	359.04	7,299.1	288.2	-539.3	352.4	7.50	7.50	0.00
7,700.0	81.81	359.04	7,319.8	386.0	-541.0	449.6	7.50	7.50	0.00
7,800.0	89.31	359.04	7,327.5	485.6	-542.6	548.7	7.50	7.50	0.00
7,821.0	90.88	359.04	7,327.5	506.6	-543.0	569.5	7.50	7.50	0.00

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
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Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-5-16)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,821.2	90.88	359.04	7,327.5	506.8	-543.0	569.8	0.00	0.00	0.00
Start DLS 0.50 TFO -96.52 - 7"									
7,822.2	90.88	359.04	7,327.5	507.8	-543.0	570.7	0.49	-0.06	-0.49
7,900.0	90.88	359.04	7,326.3	585.6	-544.3	648.1	0.00	0.00	0.00
8,000.0	90.88	359.04	7,324.8	685.5	-546.0	747.5	0.00	0.00	0.00
8,100.0	90.88	359.04	7,323.2	785.5	-547.7	846.9	0.00	0.00	0.00
8,200.0	90.88	359.04	7,321.7	885.5	-549.4	946.4	0.00	0.00	0.00
8,300.0	90.88	359.04	7,320.2	985.5	-551.1	1,045.8	0.00	0.00	0.00
8,400.0	90.88	359.04	7,318.6	1,085.4	-552.7	1,145.2	0.00	0.00	0.00
8,500.0	90.88	359.04	7,317.1	1,185.4	-554.4	1,244.6	0.00	0.00	0.00
8,600.0	90.88	359.04	7,315.5	1,285.4	-556.1	1,344.0	0.00	0.00	0.00
8,700.0	90.88	359.04	7,314.0	1,385.4	-557.8	1,443.5	0.00	0.00	0.00
8,800.0	90.88	359.04	7,312.5	1,485.3	-559.5	1,542.9	0.00	0.00	0.00
8,900.0	90.88	359.04	7,310.9	1,585.3	-561.2	1,642.3	0.00	0.00	0.00
9,000.0	90.88	359.04	7,309.4	1,685.3	-562.8	1,741.7	0.00	0.00	0.00
9,100.0	90.88	359.04	7,307.9	1,785.2	-564.5	1,841.2	0.00	0.00	0.00
9,200.0	90.88	359.04	7,306.3	1,885.2	-566.2	1,940.6	0.00	0.00	0.00
9,300.0	90.88	359.04	7,304.8	1,985.2	-567.9	2,040.0	0.00	0.00	0.00
9,400.0	90.88	359.04	7,303.3	2,085.2	-569.6	2,139.4	0.00	0.00	0.00
9,500.0	90.88	359.04	7,301.7	2,185.1	-571.3	2,238.8	0.00	0.00	0.00
9,600.0	90.88	359.04	7,300.2	2,285.1	-572.9	2,338.3	0.00	0.00	0.00
9,700.0	90.88	359.04	7,298.7	2,385.1	-574.6	2,437.7	0.00	0.00	0.00
9,800.0	90.88	359.04	7,297.1	2,485.1	-576.3	2,537.1	0.00	0.00	0.00
9,900.0	90.88	359.04	7,295.6	2,585.0	-578.0	2,636.5	0.00	0.00	0.00
10,000.0	90.88	359.04	7,294.1	2,685.0	-579.7	2,735.9	0.00	0.00	0.00
10,100.0	90.88	359.04	7,292.5	2,785.0	-581.4	2,835.4	0.00	0.00	0.00
10,200.0	90.88	359.04	7,291.0	2,885.0	-583.0	2,934.8	0.00	0.00	0.00
10,300.0	90.88	359.04	7,289.5	2,984.9	-584.7	3,034.2	0.00	0.00	0.00
10,400.0	90.88	359.04	7,287.9	3,084.9	-586.4	3,133.6	0.00	0.00	0.00
10,500.0	90.88	359.04	7,286.4	3,184.9	-588.1	3,233.1	0.00	0.00	0.00
10,600.0	90.88	359.04	7,284.8	3,284.9	-589.8	3,332.5	0.00	0.00	0.00
10,700.0	90.88	359.04	7,283.3	3,384.8	-591.5	3,431.9	0.00	0.00	0.00
10,800.0	90.88	359.04	7,281.8	3,484.8	-593.2	3,531.3	0.00	0.00	0.00
10,856.4	90.88	359.04	7,280.9	3,541.2	-594.1	3,587.4	0.00	0.00	0.00
Start DLS 2.00 TFO 89.93									
10,900.0	90.88	359.91	7,280.2	3,584.8	-594.5	3,630.7	2.00	0.00	2.00
11,000.0	90.88	1.91	7,278.7	3,684.8	-592.9	3,729.7	2.00	0.00	2.00
11,065.3	90.88	3.21	7,277.7	3,750.0	-590.0	3,794.1	2.00	0.00	2.00
WP (20T-301)									
11,100.0	90.88	3.21	7,277.2	3,784.6	-588.1	3,828.2	0.00	0.00	0.00
11,200.0	90.88	3.21	7,275.6	3,884.5	-582.4	3,926.6	0.00	0.00	0.00
11,300.0	90.88	3.21	7,274.1	3,984.3	-576.8	4,025.0	0.00	0.00	0.00
11,400.0	90.88	3.21	7,272.5	4,084.1	-571.2	4,123.4	0.00	0.00	0.00
11,500.0	90.88	3.21	7,271.0	4,183.9	-565.6	4,221.8	0.00	0.00	0.00
11,600.0	90.88	3.21	7,269.5	4,283.8	-560.0	4,320.1	0.00	0.00	0.00
11,700.0	90.88	3.21	7,267.9	4,383.6	-554.4	4,418.5	0.00	0.00	0.00
11,760.0	90.88	3.21	7,267.0	4,443.5	-551.1	4,477.5	0.00	0.00	0.00
TD at 11760.0 - BHL 500'FNL, 1340'FEL									

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Project:	SEC.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**North Reference:**	True
Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-5-16)		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 319'FSL, 829'FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,317,940.67	3,197,036.39	40.203993	-104.794567
BHL 500'FNL, 1340'FEL - plan hits target center - Point	0.00	0.00	7,267.0	4,443.5	-551.1	1,322,379.44	3,196,450.03	40.216190	-104.796540
WP (20T-301) - plan hits target center - Point	0.00	0.00	7,277.7	3,750.0	-590.0	1,321,685.68	3,196,416.61	40.214286	-104.796680

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,821.2	7,327.5	7"	7	8-3/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,965.6	3,930.0	Parkman		0.00	
4,426.6	4,385.0	Sussex		0.00	
5,005.6	4,960.0	Shannon		0.00	
7,099.6	7,021.0	Sharon Springs		0.00	
7,287.1	7,156.0	Niobrara A		0.00	
7,338.4	7,187.0	Niobrara B		0.00	
7,541.1	7,281.0	Niobrara C		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
800.0	800.0	0.0	0.0	KOP - Start Build 1.50
4,584.5	4,540.9	-252.2	-497.0	Start Drop -2.00
6,609.3	6,563.7	-269.0	-530.0	KOP #2 - Start Build 7.50
7,821.2	7,327.5	506.8	-543.0	Start DLS 0.50 TFO -96.52
10,856.4	7,280.9	3,541.2	-594.1	Start DLS 2.00 TFO 89.93
11,760.0	7,267.0	4,443.5	-551.1	TD at 11760.0

ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.20-T3N-R66W
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W
Niles Miller 20T-301

Wellbore #1
Plan #2 (2-5-16)

Anticollision Report

08 February, 2016

PDC ENERGY
Growing E&P Value

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Reference	Plan #2 (2-5-16)		
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 1,000.0 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.45 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/5/2016

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,760.0	Plan #2 (2-5-16) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Existing Wells Sec.20-T3N-R66W						
Brattain Marble Unit 1 (Exist) - Wellbore #1 - Wellbore #1	11,001.0	7,238.1	115.8	10.8	1.103	Level 2, CC, ES, SF
Miller 4-20J (Exist) - Wellbore #1 - Wellbore #1	8,357.8	7,318.4	59.2	8.0	1.156	Level 2, CC, ES, SF
Miller 43-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	9,134.7	7,291.7	709.5	645.2	11.029	CC, ES
Miller 43-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	9,300.0	7,300.0	728.5	660.6	10.720	SF
Miller 43-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	8,935.1	7,325.0	692.3	631.3	11.338	CC, ES
Miller 43-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	9,100.0	7,319.2	711.7	647.1	11.029	SF
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	796.2	803.3	436.2	432.5	118.733	CC
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	800.0	807.0	436.2	432.5	118.109	ES
Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1	7,700.0	7,354.3	837.8	795.6	19.866	SF
Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	790.4	799.4	465.2	461.6	127.519	CC
Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	800.0	808.9	465.2	461.5	125.813	ES
Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1	7,800.0	7,362.6	794.3	750.9	18.304	SF
Miller 5 (Exist) - Wellbore #1 - Wellbore #1	8,403.3	7,300.0	188.2	135.0	3.537	CC, ES, SF
Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,185.5	6,128.4	480.2	446.4	14.215	CC
Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,400.0	6,341.0	480.8	446.0	13.832	ES
Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,700.0	6,634.0	485.5	449.5	13.473	SF
Raymond 15N-29HZ (Exist) - Wellbore #1 - Wellbore #1	4,604.5	4,454.2	708.0	681.3	26.514	CC, ES
Raymond 15N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,750.0	6,698.0	794.1	757.1	21.454	SF
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	3,372.1	3,325.2	302.0	278.9	13.050	CC
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	3,400.0	3,352.8	302.1	278.7	12.916	ES
Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1	3,600.0	3,545.0	307.9	283.0	12.358	SF
Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1	6,611.7	6,540.8	111.9	73.0	2.878	CC, ES, SF
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	2,998.7	2,952.4	390.0	369.4	18.919	CC
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	3,000.0	2,953.6	390.0	369.4	18.908	ES
Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1	3,500.0	3,435.6	421.2	396.7	17.237	SF
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	2,756.4	2,718.3	396.3	377.1	20.668	CC, ES
Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1	3,100.0	3,028.6	425.1	402.9	19.144	SF
Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1	11,593.7	7,256.7	499.0	379.3	4.171	CC
Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1	11,600.0	7,256.5	499.0	379.2	4.167	ES, SF
Soco 20-2K (Exist) - Wellbore #1 - Wellbore #1	11,455.5	7,219.1	692.9	573.6	5.810	CC, ES
Soco 20-2K (Exist) - Wellbore #1 - Wellbore #1	11,500.0	7,218.0	694.3	574.0	5.773	SF
Soco 20-7K (Exist) - Wellbore #1 - Wellbore #1	10,444.9	7,248.0	339.2	244.8	3.593	CC, ES
Soco 20-7K (Exist) - Wellbore #1 - Wellbore #1	10,500.0	7,247.3	343.7	248.0	3.592	SF
Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1	10,484.6	7,272.1	493.7	397.0	5.108	CC
Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1	10,500.0	7,272.1	493.9	396.9	5.092	ES, SF

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W						
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	200.0	199.0	45.0	44.1	54.726	CC
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	300.0	298.8	45.1	43.8	33.294	ES
Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15)	11,400.0	11,480.1	999.8	803.9	5.102	SF
Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)	400.0	399.0	30.0	28.1	15.616	CC
Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)	500.0	498.8	30.2	27.8	12.339	ES
Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)	11,760.0	11,861.4	564.7	353.4	2.673	SF
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	800.0	800.0	15.1	11.0	3.660	CC, ES
Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15)	11,760.0	11,632.9	344.8	140.0	1.683	SF
Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)	600.0	600.0	15.0	12.0	4.964	CC
Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)	700.0	699.9	15.4	11.8	4.334	ES
Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)	10,900.0	10,834.9	259.2	91.4	1.545	SF
Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15)	800.0	802.0	60.1	55.9	14.551	CC, ES
Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15)	11,760.0	11,730.3	661.9	450.0	3.123	SF
Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15)	800.0	801.0	45.0	40.8	10.903	CC, ES
Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15)	11,760.0	11,646.3	965.2	753.7	4.564	SF
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	800.0	801.0	30.0	25.8	7.266	CC, ES
Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15)	1,000.0	1,000.9	32.6	27.5	6.322	SF

Offset Design Existing Wells Sec.20-T3N-R66W - Brattain Marble Unit 1 (Exist) - Wellbore #1 - Wellbore #1

Survey Program: 100-NS-GYRO-MS

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,292.5	7,261.6	7,260.8	70.0	16.0	102.35	3,681.7	-477.7	902.7	818.5	84.21	10.720	
10,200.0	7,291.0	7,258.9	7,258.2	72.3	16.0	101.13	3,681.7	-477.7	803.8	717.1	86.69	9.271	
10,300.0	7,289.5	7,256.3	7,255.5	74.5	16.0	99.90	3,681.7	-477.6	705.0	615.9	89.17	7.907	
10,400.0	7,287.9	7,253.7	7,252.9	76.8	16.0	98.67	3,681.8	-477.5	606.8	515.1	91.63	6.622	
10,500.0	7,286.4	7,251.1	7,250.3	79.0	16.0	97.44	3,681.8	-477.5	509.1	415.1	94.07	5.412	
10,600.0	7,284.8	7,248.5	7,247.7	81.3	16.0	96.20	3,681.8	-477.4	412.6	316.1	96.49	4.276	
10,700.0	7,283.3	7,245.9	7,245.1	83.6	16.0	94.96	3,681.8	-477.4	318.2	219.3	98.88	3.218	
10,800.0	7,281.8	7,243.3	7,242.5	85.8	16.0	93.73	3,681.9	-477.3	228.6	127.4	101.25	2.258	
10,856.4	7,280.9	7,241.9	7,241.1	87.1	16.0	93.03	3,681.9	-477.3	182.9	80.4	102.57	1.783	
10,900.0	7,280.2	7,240.7	7,240.0	88.0	16.0	92.54	3,681.9	-477.3	152.3	48.9	103.36	1.473	Level 3
11,000.0	7,278.7	7,238.1	7,237.3	90.0	16.0	91.30	3,681.9	-477.2	115.8	10.8	104.94	1.103	Level 2
11,001.0	7,278.7	7,238.1	7,237.3	90.0	16.0	91.28	3,681.9	-477.2	115.8	10.8	104.96	1.103	Level 2, CC, ES, SF
11,065.3	7,277.7	7,236.3	7,235.5	91.3	16.0	90.44	3,681.9	-477.2	131.8	25.9	105.89	1.245	Level 2
11,100.0	7,277.2	7,235.4	7,234.6	92.0	15.9	89.97	3,682.0	-477.1	151.2	44.5	106.60	1.418	Level 3
11,200.0	7,275.6	7,232.6	7,231.9	94.2	15.9	88.63	3,682.0	-477.1	228.3	119.5	108.78	2.098	
11,300.0	7,274.1	7,229.9	7,229.1	96.5	15.9	87.30	3,682.0	-477.0	318.3	207.4	110.90	2.871	
11,400.0	7,272.5	7,227.2	7,226.4	98.7	15.9	85.97	3,682.0	-476.9	413.0	300.0	112.97	3.656	
11,500.0	7,271.0	7,224.5	7,223.7	101.0	15.9	84.65	3,682.1	-476.9	509.7	394.7	114.99	4.432	
11,600.0	7,269.5	7,221.8	7,221.0	103.2	15.9	83.34	3,682.1	-476.8	607.4	490.5	116.95	5.194	
11,700.0	7,267.9	7,219.1	7,218.3	105.5	15.9	82.05	3,682.1	-476.8	705.8	586.9	118.85	5.938	
11,760.0	7,267.0	7,217.5	7,216.7	106.8	15.9	81.27	3,682.1	-476.7	765.0	645.0	119.97	6.377	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 4-20J (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,350.0	7,193.7	7,191.0	7,188.8	22.4	18.6	-5.77	1,042.5	-608.3	982.4	958.0	24.41	40.246	
7,400.0	7,220.6	7,219.3	7,217.1	22.5	18.7	-6.78	1,042.5	-609.1	940.4	917.8	22.66	41.500	
7,450.0	7,244.7	7,244.9	7,242.7	22.6	18.7	-8.10	1,042.5	-609.7	896.7	875.7	21.00	42.702	
7,500.0	7,265.8	7,267.2	7,265.0	22.7	18.8	-9.91	1,042.5	-610.2	851.5	832.0	19.58	43.501	
7,550.0	7,284.0	7,286.3	7,284.1	22.9	18.9	-12.46	1,042.4	-610.6	805.1	786.4	18.66	43.140	
7,600.0	7,299.1	7,301.8	7,299.6	23.1	18.9	-16.28	1,042.3	-610.9	757.5	738.7	18.76	40.371	
7,650.0	7,311.1	7,313.4	7,311.1	23.4	18.9	-22.31	1,042.2	-611.2	709.1	688.3	20.72	34.217	
7,700.0	7,319.8	7,321.8	7,319.5	23.9	19.0	-32.82	1,042.2	-611.3	660.0	634.1	25.88	25.505	
7,750.0	7,325.3	7,327.0	7,324.7	24.3	19.0	-52.46	1,042.2	-611.4	610.5	575.4	35.15	17.370	
7,800.0	7,327.5	7,329.0	7,326.7	24.9	19.0	-84.65	1,042.2	-611.4	560.8	518.4	42.44	13.214	
7,821.0	7,327.5	7,328.9	7,326.6	25.1	19.0	-98.93	1,042.2	-611.4	540.0	498.3	41.69	12.952	
7,821.2	7,327.5	7,328.9	7,326.6	25.1	19.0	-98.93	1,042.2	-611.4	539.7	498.0	41.69	12.945	
7,822.2	7,327.5	7,328.8	7,326.6	25.2	19.0	-98.91	1,042.2	-611.4	538.8	497.1	41.71	12.918	
7,900.0	7,326.3	7,327.3	7,325.1	26.1	19.0	-97.50	1,042.2	-611.4	461.5	418.7	42.83	10.776	
8,000.0	7,324.8	7,325.4	7,323.2	27.5	19.0	-95.67	1,042.2	-611.4	362.6	318.1	44.55	8.140	
8,100.0	7,323.2	7,323.5	7,321.2	29.0	19.0	-93.80	1,042.2	-611.3	264.5	218.1	46.35	5.706	
8,200.0	7,321.7	7,321.5	7,319.3	30.7	19.0	-91.92	1,042.2	-611.3	168.5	120.3	48.22	3.495	
8,300.0	7,320.2	7,319.5	7,317.3	32.4	19.0	-90.03	1,042.2	-611.3	82.8	32.6	50.13	1.651	
8,357.8	7,319.3	7,318.4	7,316.2	33.5	19.0	-88.92	1,042.2	-611.2	59.2	8.0	51.25	1.156	Level 2, CC, ES, SF
8,400.0	7,318.6	7,317.6	7,315.3	34.2	19.0	-88.12	1,042.2	-611.2	72.7	20.7	52.06	1.397	Level 3
8,500.0	7,317.1	7,315.6	7,313.3	36.1	19.0	-86.20	1,042.2	-611.2	154.0	100.0	53.99	2.853	
8,600.0	7,315.5	7,313.6	7,311.3	38.0	18.9	-84.28	1,042.2	-611.2	249.3	193.4	55.90	4.459	
8,700.0	7,314.0	7,311.6	7,309.3	40.0	18.9	-82.36	1,042.3	-611.1	347.2	289.4	57.79	6.008	
8,800.0	7,312.5	7,309.6	7,307.3	42.0	18.9	-80.44	1,042.3	-611.1	446.1	386.4	59.64	7.479	
8,900.0	7,310.9	7,307.5	7,305.3	44.0	18.9	-78.54	1,042.3	-611.0	545.3	483.9	61.45	8.875	
9,000.0	7,309.4	7,305.5	7,303.3	46.1	18.9	-76.65	1,042.3	-611.0	644.8	581.6	63.19	10.204	
9,100.0	7,307.9	7,303.5	7,301.2	48.2	18.9	-74.77	1,042.3	-611.0	744.4	679.5	64.88	11.474	
9,200.0	7,306.3	7,301.4	7,299.2	50.3	18.9	-72.91	1,042.3	-610.9	844.1	777.6	66.50	12.694	
9,300.0	7,304.8	7,300.0	7,297.8	52.4	18.9	-71.67	1,042.3	-610.9	943.9	875.7	68.22	13.836	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 43-20 - Encana (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	7,317.1	7,271.4	7,270.0	36.1	16.3	86.90	1,830.6	143.6	951.8	900.7	51.08	18.633	
8,600.0	7,315.5	7,274.6	7,273.2	38.0	16.3	87.16	1,830.8	143.7	888.3	835.2	53.08	16.736	
8,700.0	7,314.0	7,277.8	7,276.4	40.0	16.3	87.42	1,830.9	143.8	832.0	776.9	55.12	15.095	
8,800.0	7,312.5	7,281.0	7,279.5	42.0	16.3	87.67	1,831.1	143.8	784.5	727.3	57.19	13.716	
8,900.0	7,310.9	7,284.2	7,282.7	44.0	16.3	87.93	1,831.3	143.9	747.3	688.0	59.30	12.603	
9,000.0	7,309.4	7,287.4	7,285.9	46.1	16.3	88.19	1,831.4	144.0	722.2	660.8	61.43	11.757	
9,100.0	7,307.9	7,290.6	7,289.1	48.2	16.4	88.45	1,831.6	144.1	710.4	646.8	63.58	11.173	
9,134.7	7,307.3	7,291.7	7,290.2	48.9	16.4	88.54	1,831.6	144.1	709.5	645.2	64.33	11.029	CC, ES
9,200.0	7,306.3	7,293.8	7,292.3	50.3	16.4	88.70	1,831.7	144.2	712.5	646.8	65.75	10.837	
9,300.0	7,304.8	7,300.0	7,298.5	52.4	16.4	89.21	1,832.1	144.3	728.5	660.6	67.96	10.720	SF
9,400.0	7,303.3	7,300.0	7,298.5	54.6	16.4	89.21	1,832.1	144.3	757.5	687.3	70.14	10.799	
9,500.0	7,301.7	7,300.0	7,298.5	56.8	16.4	89.21	1,832.1	144.3	798.0	725.6	72.34	11.031	
9,600.0	7,300.2	7,300.0	7,298.5	58.9	16.4	89.21	1,832.1	144.3	848.4	773.8	74.55	11.380	
9,700.0	7,298.7	7,309.4	7,307.9	61.1	16.4	89.96	1,832.5	144.6	907.0	830.2	76.82	11.807	
9,800.0	7,297.1	7,312.4	7,310.9	63.3	16.4	90.21	1,832.7	144.6	972.4	893.3	79.06	12.299	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 43-20 - PDC (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	7,320.2	7,347.3	7,346.5	32.4	17.3	93.07	1,631.9	129.8	939.3	890.7	48.54	19.350	
8,400.0	7,318.6	7,343.8	7,343.0	34.2	17.3	92.78	1,631.9	129.9	874.8	824.4	50.39	17.363	
8,500.0	7,317.1	7,340.3	7,339.5	36.1	17.2	92.49	1,632.0	130.0	817.6	765.3	52.29	15.635	
8,600.0	7,315.5	7,336.8	7,336.0	38.0	17.2	92.20	1,632.1	130.1	769.1	714.8	54.24	14.178	
8,700.0	7,314.0	7,333.3	7,332.5	40.0	17.2	91.91	1,632.1	130.1	731.1	674.9	56.24	13.000	
8,800.0	7,312.5	7,329.7	7,328.9	42.0	17.2	91.62	1,632.2	130.2	705.4	647.1	58.27	12.105	
8,900.0	7,310.9	7,326.2	7,325.4	44.0	17.2	91.33	1,632.3	130.3	693.2	632.9	60.33	11.490	
8,935.1	7,310.4	7,325.0	7,324.2	44.8	17.2	91.22	1,632.3	130.3	692.3	631.3	61.06	11.338	CC, ES
9,000.0	7,309.4	7,322.7	7,321.9	46.1	17.2	91.03	1,632.4	130.4	695.4	632.9	62.42	11.140	
9,100.0	7,307.9	7,319.2	7,318.4	48.2	17.2	90.74	1,632.4	130.4	711.7	647.1	64.53	11.029	SF
9,200.0	7,306.3	7,315.7	7,314.9	50.3	17.2	90.45	1,632.5	130.5	741.2	674.5	66.66	11.120	
9,300.0	7,304.8	7,312.1	7,311.3	52.4	17.2	90.16	1,632.6	130.6	782.5	713.7	68.80	11.373	
9,400.0	7,303.3	7,308.6	7,307.8	54.6	17.2	89.87	1,632.6	130.7	833.8	762.8	70.96	11.750	
9,500.0	7,301.7	7,305.1	7,304.3	56.8	17.1	89.58	1,632.7	130.7	893.3	820.2	73.13	12.215	
9,600.0	7,300.2	7,301.6	7,300.8	58.9	17.1	89.29	1,632.8	130.8	959.6	884.3	75.31	12.742	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	7.0	7.0	0.0	0.0	59.54	221.2	376.2	436.4	436.4	0.01	N/A	
100.0	100.0	107.4	107.4	0.1	0.2	59.52	221.4	376.1	436.4	436.1	0.32	1,384.366	
115.0	115.0	122.0	122.0	0.2	0.2	59.51	221.4	376.0	436.4	436.0	0.39	1,126.768	
200.0	200.0	205.0	205.0	0.4	0.4	59.51	221.5	376.2	436.6	435.8	0.80	547.166	
300.0	300.0	305.8	305.8	0.7	0.6	59.50	221.8	376.5	436.9	435.6	1.33	329.572	
400.0	400.0	408.4	408.4	1.0	0.8	59.55	221.4	376.6	436.9	435.1	1.80	242.810	
447.3	447.3	454.3	454.3	1.1	0.9	59.59	221.1	376.7	436.8	434.8	2.02	216.647	
500.0	500.0	505.8	505.8	1.2	1.0	59.62	221.0	376.9	436.9	434.6	2.26	193.415	
600.0	600.0	609.7	609.7	1.5	1.2	59.62	220.9	376.7	436.6	433.9	2.74	159.479	
700.0	700.0	707.7	707.7	1.8	1.4	59.60	220.8	376.3	436.3	433.1	3.19	136.662	
796.2	796.2	803.3	803.2	2.1	1.6	59.59	220.8	376.2	436.2	432.5	3.67	118.733	CC
800.0	800.0	807.0	807.0	2.1	1.6	59.59	220.8	376.2	436.2	432.5	3.69	118.109	ES
900.0	900.0	905.9	905.9	2.3	1.9	176.49	221.0	376.2	437.6	433.5	4.19	104.514	
1,000.0	999.9	1,008.3	1,008.3	2.5	2.1	176.44	221.5	375.9	441.5	436.8	4.68	94.244	
1,100.0	1,099.7	1,109.1	1,109.1	2.8	2.4	176.45	221.5	375.4	447.6	442.4	5.17	86.611	
1,200.0	1,199.3	1,207.3	1,207.3	3.1	2.6	176.55	221.1	375.2	456.3	450.7	5.60	81.464	
1,300.0	1,298.6	1,304.9	1,304.9	3.4	2.8	176.65	220.9	375.3	468.1	462.0	6.03	77.649	
1,400.0	1,397.5	1,406.9	1,406.8	3.7	3.0	176.76	220.6	375.2	482.2	475.7	6.48	74.377	
1,414.8	1,412.1	1,421.1	1,421.1	3.8	3.0	176.78	220.6	375.2	484.5	477.9	6.55	73.932	
1,500.0	1,496.2	1,503.5	1,503.5	4.1	3.2	176.86	220.5	375.0	497.9	491.0	6.97	71.448	
1,600.0	1,595.0	1,605.4	1,605.4	4.5	3.4	176.93	220.5	374.5	513.6	506.1	7.50	68.490	
1,700.0	1,693.7	1,704.1	1,704.1	4.9	3.7	176.98	220.5	373.7	528.9	520.9	8.03	65.826	
1,800.0	1,792.4	1,800.0	1,800.0	5.3	4.0	177.00	220.9	373.2	544.6	536.0	8.57	63.526	
1,900.0	1,891.1	1,901.5	1,901.4	5.7	4.2	177.06	221.1	372.7	560.3	551.2	9.12	61.422	
2,000.0	1,989.8	1,999.0	1,999.0	6.2	4.5	177.11	221.1	372.2	575.8	566.1	9.68	59.504	
2,100.0	2,088.5	2,096.0	2,095.9	6.6	4.7	177.19	221.0	372.0	591.6	581.4	10.17	58.154	
2,200.0	2,187.2	2,199.2	2,199.2	7.0	4.9	177.32	220.2	371.9	607.2	596.5	10.65	57.015	
2,300.0	2,285.9	2,297.0	2,297.0	7.5	5.1	177.43	219.5	371.5	622.5	611.3	11.17	55.705	
2,400.0	2,384.6	2,395.5	2,395.4	7.9	5.4	177.51	219.0	371.0	637.8	626.1	11.73	54.393	
2,500.0	2,483.3	2,495.7	2,495.7	8.4	5.6	177.62	218.3	370.7	653.2	640.9	12.27	53.231	
2,600.0	2,582.0	2,602.7	2,602.6	8.8	5.9	177.75	216.8	369.8	667.8	654.9	12.84	52.023	
2,700.0	2,680.7	2,700.0	2,699.9	9.3	6.2	177.83	215.5	368.3	681.9	668.5	13.41	50.865	
2,800.0	2,779.4	2,797.3	2,797.2	9.7	6.5	177.93	214.3	367.2	696.3	682.3	13.97	49.830	
2,900.0	2,878.2	2,900.0	2,899.9	10.2	6.7	178.03	212.8	365.8	710.5	695.9	14.56	48.799	
3,000.0	2,976.9	2,994.7	2,994.5	10.7	7.0	178.08	211.8	364.4	724.7	709.5	15.14	47.873	
3,100.0	3,075.6	3,096.9	3,096.8	11.1	7.3	178.14	210.9	363.0	739.0	723.3	15.74	46.953	
3,200.0	3,174.3	3,196.2	3,196.0	11.6	7.6	178.17	210.0	361.2	753.1	736.8	16.33	46.106	
3,300.0	3,273.0	3,290.5	3,290.3	12.0	7.9	178.17	209.7	359.6	767.5	750.6	16.92	45.364	
3,400.0	3,371.7	3,393.7	3,393.5	12.5	8.2	178.18	209.3	358.0	782.0	764.4	17.53	44.602	
3,500.0	3,470.4	3,490.3	3,490.1	13.0	8.5	178.15	209.2	356.1	796.2	778.1	18.12	43.942	
3,600.0	3,569.1	3,586.3	3,586.1	13.4	8.8	178.12	209.3	354.4	810.9	792.2	18.71	43.345	
3,700.0	3,667.8	3,689.9	3,689.7	13.9	9.1	178.10	209.3	352.7	825.4	806.1	19.32	42.725	
3,800.0	3,766.5	3,786.6	3,786.3	14.3	9.4	178.04	209.8	350.6	839.8	819.9	19.90	42.196	
3,900.0	3,865.2	3,880.4	3,880.1	14.8	9.7	177.95	210.8	348.7	854.6	834.1	20.46	41.774	
4,000.0	3,963.9	3,983.0	3,982.7	15.3	9.9	177.87	211.9	346.9	869.6	848.5	21.04	41.327	
4,100.0	4,062.6	4,081.0	4,080.7	15.7	10.2	177.82	212.5	345.0	884.2	862.6	21.62	40.890	
4,200.0	4,161.4	4,185.9	4,185.6	16.2	10.5	177.75	213.1	342.9	898.8	876.5	22.24	40.419	
4,300.0	4,260.1	4,299.1	4,298.7	16.7	10.9	177.74	212.4	339.8	912.2	889.3	22.89	39.858	
4,400.0	4,358.8	4,399.3	4,398.8	17.1	11.2	177.76	211.1	336.5	924.7	901.2	23.50	39.351	
4,500.0	4,457.5	4,497.2	4,496.7	17.6	11.5	177.77	209.8	333.3	937.2	913.1	24.11	38.880	
4,584.5	4,540.9	4,580.8	4,580.2	18.0	11.8	177.80	208.4	330.8	947.9	923.3	24.62	38.501	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,600.0	4,556.2	4,596.1	4,595.5	18.1	11.8	177.80	208.2	330.3	949.8	925.1	24.72	38.421	
4,700.0	4,655.2	4,694.9	4,694.2	18.4	12.1	177.84	206.5	327.4	960.2	934.9	25.33	37.912	
4,800.0	4,754.7	4,800.0	4,799.3	18.6	12.4	177.88	204.6	324.2	966.9	941.0	25.92	37.309	
4,900.0	4,854.5	4,889.6	4,888.8	18.9	12.7	177.91	202.9	321.7	970.4	943.9	26.41	36.740	
5,000.0	4,954.4	4,986.2	4,985.4	19.1	13.0	177.95	201.3	319.7	971.1	944.2	26.89	36.118	
5,045.6	5,000.0	5,028.5	5,027.7	19.1	13.1	61.04	200.8	318.8	970.4	943.3	27.09	35.821	
5,100.0	5,054.4	5,077.7	5,076.9	19.2	13.3	61.03	200.4	318.0	969.4	942.0	27.37	35.418	
5,200.0	5,154.4	5,176.7	5,175.9	19.4	13.6	61.00	200.2	316.5	967.9	940.0	27.91	34.685	
5,300.0	5,254.4	5,266.3	5,265.4	19.6	13.8	60.96	200.4	315.2	966.8	938.5	28.37	34.080	
5,329.8	5,284.2	5,291.9	5,291.0	19.6	13.9	60.95	200.5	315.1	966.8	938.3	28.50	33.922	
5,400.0	5,354.4	5,363.3	5,362.5	19.8	14.0	60.91	201.0	314.8	966.8	938.0	28.81	33.553	
5,489.2	5,443.6	5,451.4	5,450.6	19.9	14.2	60.85	201.8	314.2	966.6	937.4	29.20	33.101	
5,500.0	5,454.4	5,461.7	5,460.9	19.9	14.2	60.84	201.9	314.2	966.7	937.4	29.25	33.048	
5,600.0	5,554.4	5,562.0	5,561.2	20.1	14.5	60.79	202.8	313.8	966.8	937.1	29.69	32.566	
5,700.0	5,654.4	5,665.0	5,664.1	20.3	14.7	60.70	204.0	313.0	966.7	936.5	30.16	32.048	
5,800.0	5,754.4	5,771.5	5,770.7	20.5	15.0	60.64	204.7	311.9	966.1	935.4	30.69	31.476	
5,900.0	5,854.4	5,874.6	5,873.7	20.7	15.3	60.57	205.1	310.3	964.9	933.7	31.24	30.884	
6,000.0	5,954.4	5,972.4	5,971.5	20.9	15.6	60.52	205.2	308.9	963.7	931.9	31.78	30.323	
6,100.0	6,054.4	6,076.3	6,075.4	21.0	15.9	60.45	205.7	307.2	962.6	930.2	32.34	29.766	
6,200.0	6,154.4	6,177.2	6,176.3	21.2	16.2	60.38	205.9	305.3	961.0	928.1	32.89	29.217	
6,300.0	6,254.4	6,273.7	6,272.8	21.4	16.5	60.35	205.6	303.9	959.6	926.2	33.44	28.698	
6,400.0	6,354.4	6,376.7	6,375.8	21.6	16.9	60.31	205.7	302.4	958.4	924.3	34.01	28.182	
6,500.0	6,454.4	6,481.9	6,480.9	21.8	17.2	60.24	205.7	300.3	956.6	922.0	34.58	27.661	
6,609.3	6,563.6	6,595.7	6,594.7	22.0	17.6	60.20	205.0	297.6	954.1	918.9	35.21	27.099	
6,650.0	6,604.4	6,635.8	6,634.8	22.1	17.7	61.31	204.6	296.7	952.5	917.2	35.37	26.928	
6,700.0	6,654.2	6,684.6	6,683.6	22.2	17.8	61.74	204.1	295.7	949.3	913.7	35.54	26.713	
6,750.0	6,703.6	6,737.2	6,736.1	22.3	18.0	62.49	203.5	294.5	944.5	908.8	35.68	26.472	
6,800.0	6,752.4	6,790.9	6,789.8	22.3	18.2	63.55	202.8	293.1	938.0	902.2	35.81	26.194	
6,850.0	6,800.4	6,838.9	6,837.8	22.4	18.3	64.85	202.0	291.7	930.0	894.1	35.92	25.892	
6,900.0	6,847.4	6,885.0	6,883.9	22.4	18.4	66.38	201.3	290.4	921.0	884.9	36.04	25.553	
6,950.0	6,893.2	6,931.8	6,930.7	22.4	18.6	68.20	200.6	289.0	910.9	874.7	36.20	25.163	
7,000.0	6,937.6	6,978.2	6,977.0	22.4	18.7	70.28	200.0	287.5	900.0	863.5	36.41	24.717	
7,050.0	6,980.3	7,021.7	7,020.5	22.4	18.9	72.52	199.4	286.0	888.4	851.7	36.67	24.227	
7,100.0	7,021.3	7,062.3	7,061.1	22.4	19.0	74.88	198.9	284.6	876.6	839.6	36.98	23.706	
7,150.0	7,060.4	7,100.9	7,099.6	22.4	19.1	77.35	198.4	283.3	864.9	827.6	37.34	23.165	
7,200.0	7,097.3	7,137.3	7,136.1	22.4	19.2	79.86	197.9	282.0	853.6	815.9	37.73	22.625	
7,250.0	7,131.9	7,171.5	7,170.2	22.4	19.4	82.34	197.5	280.8	843.0	804.9	38.14	22.103	
7,300.0	7,164.0	7,203.2	7,201.9	22.4	19.5	84.74	197.1	279.7	833.6	795.1	38.56	21.619	
7,350.0	7,193.7	7,232.3	7,230.9	22.4	19.5	86.98	196.7	278.7	825.7	786.7	38.97	21.187	
7,400.0	7,220.6	7,258.6	7,257.3	22.5	19.6	89.01	196.4	277.7	819.7	780.3	39.38	20.815	
7,450.0	7,244.7	7,282.2	7,280.8	22.6	19.7	90.75	196.0	276.9	815.8	776.0	39.78	20.508	
7,500.0	7,265.8	7,302.8	7,301.4	22.7	19.8	92.17	195.8	276.2	814.5	774.3	40.19	20.265	
7,500.4	7,266.0	7,302.9	7,301.5	22.7	19.8	92.18	195.8	276.2	814.5	774.3	40.19	20.263	
7,550.0	7,284.0	7,320.4	7,319.0	22.9	19.8	93.23	195.5	275.6	815.8	775.2	40.62	20.083	
7,600.0	7,299.1	7,334.8	7,333.4	23.1	19.9	93.88	195.4	275.1	820.1	779.0	41.09	19.958	
7,650.0	7,311.1	7,346.2	7,344.8	23.4	19.9	94.10	195.2	274.7	827.5	785.8	41.61	19.887	
7,700.0	7,319.8	7,354.3	7,352.9	23.9	19.9	93.87	195.1	274.4	837.8	795.6	42.17	19.866 SF	
7,750.0	7,325.3	7,359.2	7,357.7	24.3	19.9	93.18	195.0	274.2	851.1	808.4	42.77	19.899	
7,800.0	7,327.5	7,360.8	7,359.4	24.9	20.0	92.01	195.0	274.2	867.3	823.9	43.39	19.990	
7,821.0	7,327.5	7,360.5	7,359.1	25.1	19.9	91.38	195.0	274.2	874.9	831.2	43.64	20.047	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - Encana (Exist) - Wellbore #1 - Wellbore #1

Survey Program: 100-NS-GYRO-MS

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,821.2	7,327.5	7,360.5	7,359.1	25.1	19.9	91.38	195.0	274.2	875.0	831.3	43.65	20.047	
7,822.2	7,327.5	7,360.5	7,359.0	25.2	19.9	91.38	195.0	274.2	875.3	831.7	43.66	20.050	
7,900.0	7,326.3	7,358.3	7,356.9	26.1	19.9	91.23	195.1	274.2	907.3	862.7	44.57	20.355	
8,000.0	7,324.8	7,355.5	7,354.1	27.5	19.9	91.03	195.1	274.3	956.0	910.0	46.04	20.764	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	9.0	9.0	0.0	0.0	45.40	326.9	331.5	465.6	465.6	0.01	N/A	
100.0	100.0	109.0	109.0	0.1	0.2	45.38	327.0	331.4	465.6	465.2	0.32	1,460.989	
100.5	100.5	109.5	109.5	0.1	0.2	45.38	327.0	331.4	465.6	465.2	0.32	1,450.272	
200.0	200.0	207.1	207.1	0.4	0.4	45.38	327.2	331.5	465.8	465.0	0.80	579.898	
300.0	300.0	307.6	307.6	0.7	0.6	45.38	327.4	331.8	466.2	464.8	1.33	350.682	
400.0	400.0	411.3	411.3	1.0	0.8	45.42	327.0	331.9	466.0	464.2	1.80	258.201	
461.9	461.9	470.9	470.9	1.1	1.0	45.47	326.7	332.0	465.8	463.7	2.09	223.137	
500.0	500.0	508.2	508.2	1.2	1.0	45.49	326.6	332.2	465.9	463.6	2.26	205.821	
600.0	600.0	611.5	611.5	1.5	1.2	45.47	326.5	332.0	465.6	462.9	2.74	169.861	
700.0	700.0	709.6	709.6	1.8	1.4	45.45	326.4	331.6	465.3	462.1	3.20	145.553	
790.4	790.4	799.4	799.4	2.0	1.6	45.44	326.4	331.5	465.2	461.6	3.65	127.519	CC
800.0	800.0	808.9	808.9	2.1	1.6	45.44	326.4	331.5	465.2	461.5	3.70	125.813	ES
900.0	900.0	907.5	907.5	2.3	1.9	162.37	326.7	331.5	466.7	462.5	4.19	111.332	
1,000.0	999.9	1,009.7	1,009.7	2.5	2.1	162.44	327.1	331.2	470.5	465.8	4.69	100.339	
1,100.0	1,099.7	1,111.2	1,111.1	2.8	2.4	162.60	327.1	330.6	476.4	471.2	5.17	92.062	
1,200.0	1,199.3	1,209.8	1,209.8	3.1	2.6	162.91	326.7	330.5	484.7	479.1	5.61	86.370	
1,300.0	1,298.6	1,306.9	1,306.9	3.4	2.8	163.27	326.5	330.6	495.9	489.8	6.04	82.079	
1,400.0	1,397.5	1,409.2	1,409.2	3.7	3.0	163.71	326.3	330.5	509.4	502.9	6.50	78.316	
1,414.8	1,412.1	1,423.4	1,423.4	3.8	3.0	163.78	326.2	330.5	511.6	505.0	6.57	77.807	
1,500.0	1,496.2	1,505.2	1,505.2	4.1	3.2	164.17	326.2	330.3	524.6	517.6	7.00	74.981	
1,600.0	1,595.0	1,607.3	1,607.3	4.5	3.4	164.62	326.2	329.8	539.7	532.2	7.53	71.645	
1,700.0	1,693.7	1,705.5	1,705.4	4.9	3.7	165.00	326.2	329.0	554.6	546.5	8.07	68.684	
1,800.0	1,792.4	1,800.6	1,800.6	5.3	4.0	165.33	326.6	328.5	569.9	561.3	8.62	66.139	
1,900.0	1,891.1	1,903.4	1,903.4	5.7	4.2	165.70	326.7	328.0	585.2	576.1	9.18	63.777	
2,000.0	1,989.8	2,000.5	2,000.5	6.2	4.5	166.04	326.7	327.5	600.4	590.6	9.74	61.669	
2,100.0	2,088.5	2,098.5	2,098.5	6.6	4.7	166.39	326.6	327.3	615.7	605.5	10.24	60.143	
2,200.0	2,187.2	2,202.2	2,202.1	7.0	4.9	166.80	325.8	327.2	630.8	620.0	10.72	58.845	
2,300.0	2,285.9	2,300.0	2,300.0	7.5	5.1	167.15	325.1	326.8	645.6	634.3	11.25	57.395	
2,400.0	2,384.6	2,397.7	2,397.7	7.9	5.4	167.46	324.7	326.3	660.6	648.8	11.80	55.968	
2,500.0	2,483.3	2,498.9	2,498.8	8.4	5.6	167.79	323.9	326.0	675.5	663.1	12.35	54.688	
2,600.0	2,582.0	2,605.6	2,605.5	8.8	5.9	168.14	322.4	325.0	689.6	676.7	12.92	53.377	
2,700.0	2,680.7	2,702.3	2,702.2	9.3	6.2	168.41	321.2	323.6	703.4	689.9	13.49	52.141	
2,800.0	2,779.4	2,800.6	2,800.5	9.7	6.5	168.69	319.9	322.5	717.4	703.4	14.06	51.018	
2,900.0	2,878.2	2,903.3	2,903.2	10.2	6.8	168.97	318.4	321.1	731.2	716.6	14.65	49.914	
3,000.0	2,976.9	2,996.7	2,996.6	10.7	7.0	169.18	317.4	319.6	745.2	729.9	15.23	48.939	
3,100.0	3,075.6	3,099.7	3,099.5	11.1	7.3	169.41	316.5	318.2	759.3	743.4	15.83	47.955	
3,200.0	3,174.3	3,197.6	3,197.4	11.6	7.6	169.59	315.7	316.5	773.1	756.7	16.42	47.071	
3,300.0	3,273.0	3,292.2	3,292.1	12.0	7.9	169.74	315.4	314.9	787.4	770.3	17.01	46.282	
3,400.0	3,371.7	3,395.3	3,395.1	12.5	8.2	169.91	315.0	313.2	801.7	784.0	17.63	45.480	
3,500.0	3,470.4	3,491.1	3,490.9	13.0	8.5	170.02	314.9	311.4	815.8	797.6	18.21	44.790	
3,600.0	3,569.1	3,587.7	3,587.5	13.4	8.8	170.14	315.0	309.7	830.4	811.6	18.80	44.158	
3,700.0	3,667.8	3,691.0	3,690.7	13.9	9.1	170.26	315.0	308.0	844.8	825.4	19.42	43.508	
3,800.0	3,766.5	3,786.6	3,786.3	14.3	9.4	170.33	315.4	305.9	859.2	839.2	20.00	42.960	
3,900.0	3,865.2	3,880.3	3,880.0	14.8	9.6	170.36	316.5	304.0	874.0	853.5	20.56	42.516	
4,000.0	3,963.9	3,983.5	3,983.2	15.3	9.9	170.42	317.5	302.2	889.0	867.9	21.15	42.044	
4,100.0	4,062.6	4,081.3	4,080.9	15.7	10.2	170.48	318.2	300.3	903.7	882.0	21.73	41.586	
4,200.0	4,161.4	4,186.8	4,186.5	16.2	10.5	170.55	318.8	298.2	918.2	895.9	22.35	41.091	
4,300.0	4,260.1	4,301.4	4,301.0	16.7	10.9	170.66	318.1	295.1	931.5	908.5	23.00	40.499	
4,400.0	4,358.8	4,401.0	4,400.5	17.1	11.2	170.76	316.7	291.8	943.9	920.3	23.61	39.974	
4,500.0	4,457.5	4,499.4	4,498.9	17.6	11.5	170.87	315.4	288.6	956.3	932.1	24.22	39.481	
4,584.5	4,540.9	4,583.1	4,582.6	18.0	11.8	170.97	314.0	286.0	966.9	942.1	24.74	39.086	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,600.0	4,556.2	4,598.5	4,597.9	18.1	11.8	170.99	313.8	285.6	968.8	943.9	24.84	39.003	
4,700.0	4,655.2	4,697.4	4,696.8	18.4	12.1	171.13	312.1	282.7	979.0	953.6	25.44	38.478	
4,800.0	4,754.7	4,800.0	4,799.3	18.6	12.4	171.22	310.3	279.5	985.6	959.6	26.03	37.872	
4,900.0	4,854.5	4,892.4	4,891.7	18.9	12.7	171.29	308.5	276.9	989.0	962.5	26.53	37.281	
5,000.0	4,954.4	4,988.6	4,987.8	19.1	13.0	171.33	306.9	275.0	989.7	962.7	27.00	36.650	
5,045.6	5,000.0	5,030.4	5,029.6	19.1	13.1	54.41	306.4	274.1	989.0	961.8	27.18	36.383	
5,100.0	5,054.4	5,079.3	5,078.5	19.2	13.3	54.40	306.0	273.3	988.0	960.5	27.46	35.979	
5,200.0	5,154.4	5,178.0	5,177.2	19.4	13.6	54.36	305.8	271.8	986.6	958.6	28.00	35.240	
5,300.0	5,254.4	5,267.3	5,266.5	19.6	13.8	54.31	306.0	270.5	985.7	957.2	28.46	34.634	
5,322.0	5,276.4	5,286.2	5,285.4	19.6	13.9	54.30	306.1	270.4	985.6	957.1	28.56	34.515	
5,400.0	5,354.4	5,364.2	5,363.3	19.8	14.0	54.27	306.7	270.1	985.7	956.8	28.90	34.103	
5,463.0	5,417.4	5,427.2	5,426.3	19.9	14.2	54.22	307.3	269.7	985.7	956.5	29.18	33.777	
5,500.0	5,454.4	5,462.6	5,461.8	19.9	14.2	54.20	307.6	269.5	985.7	956.4	29.34	33.595	
5,600.0	5,554.4	5,562.5	5,561.7	20.1	14.5	54.15	308.5	269.1	986.0	956.2	29.78	33.110	
5,700.0	5,654.4	5,665.7	5,664.9	20.3	14.7	54.06	309.7	268.3	986.0	955.7	30.26	32.587	
5,800.0	5,754.4	5,772.3	5,771.5	20.5	15.0	53.99	310.4	267.2	985.6	954.8	30.79	32.010	
5,900.0	5,854.4	5,876.0	5,875.1	20.7	15.3	53.92	310.7	265.6	984.5	953.1	31.34	31.412	
6,000.0	5,954.4	5,973.2	5,972.3	20.9	15.6	53.87	310.8	264.2	983.4	951.5	31.88	30.848	
6,100.0	6,054.4	6,077.0	6,076.1	21.0	15.9	53.78	311.4	262.5	982.4	950.0	32.44	30.288	
6,200.0	6,154.4	6,178.7	6,177.7	21.2	16.2	53.71	311.5	260.6	981.0	948.0	32.99	29.732	
6,300.0	6,254.4	6,275.1	6,274.2	21.4	16.5	53.67	311.3	259.2	979.6	946.1	33.54	29.208	
6,400.0	6,354.4	6,377.9	6,377.0	21.6	16.9	53.62	311.3	257.7	978.5	944.4	34.11	28.688	
6,500.0	6,454.4	6,483.1	6,482.1	21.8	17.2	53.55	311.3	255.6	976.8	942.1	34.69	28.162	
6,609.3	6,563.6	6,597.9	6,596.9	22.0	17.6	53.48	310.6	252.9	974.4	939.1	35.31	27.593	
6,650.0	6,604.4	6,637.9	6,636.9	22.1	17.7	54.58	310.2	252.0	972.8	937.3	35.48	27.416	
6,700.0	6,654.2	6,686.6	6,685.6	22.2	17.8	55.00	309.7	250.9	969.1	933.5	35.61	27.218	
6,750.0	6,703.6	6,739.6	6,738.6	22.3	18.0	55.72	309.2	249.7	963.6	927.9	35.69	26.998	
6,800.0	6,752.4	6,793.6	6,792.5	22.3	18.2	56.77	308.4	248.3	956.0	920.3	35.74	26.746	
6,850.0	6,800.4	6,841.3	6,840.2	22.4	18.3	58.05	307.6	246.9	946.6	910.8	35.76	26.470	
6,900.0	6,847.4	6,887.2	6,886.1	22.4	18.5	59.59	306.9	245.6	935.7	900.0	35.78	26.153	
6,950.0	6,893.2	6,934.0	6,932.9	22.4	18.6	61.45	306.2	244.3	923.5	887.7	35.83	25.772	
7,000.0	6,937.6	6,980.2	6,979.0	22.4	18.7	63.59	305.6	242.8	910.0	874.1	35.95	25.316	
7,050.0	6,980.3	7,023.5	7,022.3	22.4	18.9	65.94	305.1	241.3	895.6	859.4	36.13	24.790	
7,100.0	7,021.3	7,064.1	7,062.9	22.4	19.0	68.47	304.5	239.9	880.4	844.0	36.38	24.197	
7,150.0	7,060.4	7,102.7	7,101.5	22.4	19.1	71.18	304.0	238.5	864.9	828.2	36.73	23.550	
7,200.0	7,097.3	7,139.2	7,137.9	22.4	19.2	73.99	303.6	237.2	849.4	812.3	37.15	22.867	
7,250.0	7,131.9	7,173.3	7,172.0	22.4	19.4	76.84	303.1	236.0	834.2	796.6	37.62	22.176	
7,300.0	7,164.0	7,205.0	7,203.7	22.4	19.5	79.67	302.7	234.9	819.8	781.7	38.12	21.503	
7,350.0	7,193.7	7,234.1	7,232.7	22.4	19.5	82.39	302.3	233.9	806.4	767.8	38.64	20.872	
7,400.0	7,220.6	7,260.4	7,259.1	22.5	19.6	84.92	302.0	233.0	794.6	755.5	39.14	20.300	
7,450.0	7,244.7	7,284.0	7,282.6	22.6	19.7	87.21	301.7	232.2	784.7	745.1	39.64	19.798	
7,500.0	7,265.8	7,304.6	7,303.2	22.7	19.8	89.17	301.4	231.4	777.2	737.1	40.12	19.372	
7,550.0	7,284.0	7,322.2	7,320.8	22.9	19.8	90.76	301.2	230.8	772.2	731.6	40.60	19.021	
7,600.0	7,299.1	7,336.7	7,335.2	23.1	19.9	91.95	301.0	230.3	770.2	729.1	41.09	18.743	
7,607.4	7,301.1	7,338.5	7,337.1	23.1	19.9	92.08	301.0	230.2	770.2	729.0	41.17	18.706	
7,650.0	7,311.1	7,348.0	7,346.6	23.4	19.9	92.68	300.8	229.9	771.4	729.7	41.62	18.534	
7,700.0	7,319.8	7,356.1	7,354.7	23.9	19.9	92.95	300.7	229.6	775.7	733.6	42.18	18.392	
7,750.0	7,325.3	7,361.0	7,359.6	24.3	20.0	92.73	300.7	229.5	783.4	740.6	42.78	18.314	
7,800.0	7,327.5	7,362.6	7,361.2	24.9	20.0	92.01	300.6	229.4	794.3	750.9	43.39	18.304	SF
7,821.0	7,327.5	7,362.3	7,360.9	25.1	20.0	91.57	300.7	229.4	799.8	756.1	43.65	18.320	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 44-20 - PDC (Exist) - Wellbore #1 - Wellbore #1

Survey Program: 100-NS-GYRO-MS

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,821.2	7,327.5	7,362.3	7,360.9	25.1	20.0	91.57	300.7	229.4	799.8	756.2	43.66	18.321	
7,822.2	7,327.5	7,362.3	7,360.8	25.2	20.0	91.56	300.7	229.4	800.1	756.4	43.67	18.322	
7,900.0	7,326.3	7,360.1	7,358.7	26.1	19.9	91.40	300.7	229.5	824.9	780.3	44.58	18.503	
8,000.0	7,324.8	7,357.3	7,355.9	27.5	19.9	91.20	300.7	229.6	866.1	820.0	46.05	18.806	
8,100.0	7,323.2	7,354.6	7,353.1	29.0	19.9	90.99	300.8	229.7	916.4	868.7	47.64	19.234	
8,200.0	7,321.7	7,351.8	7,350.4	30.7	19.9	90.78	300.8	229.8	974.3	925.0	49.33	19.750	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Miller 5 (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,450.0	7,244.7	7,234.8	7,232.1	22.6	19.9	-23.42	1,084.8	-740.0	957.9	932.3	25.60	37.414	
7,500.0	7,265.8	7,255.4	7,252.7	22.7	20.0	-27.52	1,085.0	-740.1	913.7	887.8	25.92	35.251	
7,550.0	7,284.0	7,273.3	7,270.6	22.9	20.0	-32.86	1,085.1	-740.2	868.3	841.0	27.32	31.787	
7,600.0	7,299.1	7,288.2	7,285.5	23.1	20.0	-39.85	1,085.2	-740.3	822.0	792.0	29.99	27.412	
7,650.0	7,311.1	7,300.0	7,297.3	23.4	20.1	-48.81	1,085.4	-740.3	775.0	741.2	33.80	22.927	
7,700.0	7,319.8	7,300.0	7,297.3	23.9	20.1	-57.95	1,085.4	-740.3	727.5	690.0	37.48	19.409	
7,750.0	7,325.3	7,300.0	7,297.3	24.3	20.1	-68.60	1,085.4	-740.3	679.8	638.8	40.94	16.603	
7,800.0	7,327.5	7,300.0	7,297.3	24.9	20.1	-80.16	1,085.4	-740.3	632.0	588.7	43.29	14.601	
7,821.0	7,327.5	7,300.0	7,297.3	25.1	20.1	-85.05	1,085.4	-740.3	612.0	568.2	43.78	13.979	
7,821.2	7,327.5	7,300.0	7,297.3	25.1	20.1	-85.05	1,085.4	-740.3	611.8	568.0	43.78	13.973	
7,822.2	7,327.5	7,300.0	7,297.3	25.2	20.1	-85.04	1,085.4	-740.3	610.9	567.1	43.79	13.949	
7,900.0	7,326.3	7,300.0	7,297.3	26.1	20.1	-85.04	1,085.4	-740.3	537.4	492.7	44.72	12.016	
8,000.0	7,324.8	7,300.0	7,297.3	27.5	20.1	-85.04	1,085.4	-740.3	445.1	398.9	46.21	9.633	
8,100.0	7,323.2	7,300.0	7,297.3	29.0	20.1	-85.04	1,085.4	-740.3	357.0	309.2	47.81	7.467	
8,200.0	7,321.7	7,300.0	7,297.3	30.7	20.1	-85.04	1,085.4	-740.3	277.1	227.6	49.51	5.597	
8,300.0	7,320.2	7,300.0	7,297.3	32.4	20.1	-85.04	1,085.4	-740.3	214.7	163.4	51.30	4.186	
8,400.0	7,318.6	7,300.0	7,297.3	34.2	20.1	-85.04	1,085.4	-740.3	188.3	135.1	53.15	3.542	
8,403.3	7,318.6	7,300.0	7,297.3	34.3	20.1	-85.04	1,085.4	-740.3	188.2	135.0	53.22	3.537	CC, ES, SF
8,500.0	7,317.1	7,300.0	7,297.3	36.1	20.1	-85.04	1,085.4	-740.3	211.6	156.5	55.06	3.843	
8,600.0	7,315.5	7,300.0	7,297.3	38.0	20.1	-85.04	1,085.4	-740.3	272.2	215.2	57.03	4.774	
8,700.0	7,314.0	7,300.0	7,297.3	40.0	20.1	-85.04	1,085.4	-740.3	351.3	292.3	59.03	5.952	
8,800.0	7,312.5	7,300.0	7,297.3	42.0	20.1	-85.04	1,085.4	-740.3	439.1	378.0	61.07	7.189	
8,900.0	7,310.9	7,300.0	7,297.3	44.0	20.1	-85.04	1,085.4	-740.3	531.1	468.0	63.14	8.412	
9,000.0	7,309.4	7,300.0	7,297.3	46.1	20.1	-85.04	1,085.4	-740.3	625.6	560.4	65.24	9.590	
9,100.0	7,307.9	7,300.0	7,297.3	48.2	20.1	-85.04	1,085.4	-740.3	721.6	654.3	67.36	10.713	
9,200.0	7,306.3	7,300.0	7,297.3	50.3	20.1	-85.04	1,085.4	-740.3	818.6	749.1	69.50	11.778	
9,300.0	7,304.8	7,300.0	7,297.3	52.4	20.1	-85.04	1,085.4	-740.3	916.2	844.5	71.66	12.785	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-131.75	-575.5	-644.7	865.4				
100.0	100.0	54.1	54.1	0.1	0.1	-131.75	-575.5	-644.7	864.2	864.0	0.26	3,291.220	
200.0	200.0	153.2	153.2	0.4	0.4	-131.76	-575.7	-644.8	864.4	863.6	0.80	1,080.442	
300.0	300.0	254.6	254.6	0.7	0.6	-131.75	-575.7	-645.0	864.5	863.2	1.33	651.736	
400.0	400.0	353.9	353.9	1.0	0.9	-131.71	-575.3	-645.4	864.6	862.8	1.85	466.520	
500.0	500.0	452.4	452.4	1.2	1.1	-131.67	-575.0	-646.0	864.8	862.4	2.38	362.656	
600.0	600.0	550.9	550.9	1.5	1.4	-131.64	-574.9	-646.6	865.2	862.3	2.92	296.705	
700.0	700.0	650.3	650.3	1.8	1.7	-131.62	-575.0	-647.2	865.8	862.3	3.45	251.103	
800.0	800.0	752.4	752.3	2.1	1.9	-131.63	-575.4	-647.5	866.2	862.2	3.98	217.613	
900.0	900.0	855.5	855.4	2.3	2.2	-14.73	-575.4	-647.7	865.1	860.6	4.49	192.668	
1,000.0	999.9	957.3	957.2	2.5	2.4	-14.78	-574.9	-647.9	861.1	856.1	4.99	172.688	
1,100.0	1,099.7	1,058.7	1,058.6	2.8	2.7	-14.88	-574.2	-648.0	854.4	848.9	5.49	155.603	
1,200.0	1,199.3	1,159.1	1,159.1	3.1	3.0	-15.04	-573.3	-648.0	845.0	839.0	6.00	140.829	
1,300.0	1,298.6	1,257.2	1,257.2	3.4	3.2	-15.24	-572.5	-648.1	833.2	826.7	6.51	127.964	
1,400.0	1,397.5	1,355.9	1,355.9	3.7	3.5	-15.50	-571.5	-648.4	818.9	811.9	7.03	116.477	
1,414.8	1,412.1	1,370.4	1,370.3	3.8	3.5	-15.54	-571.4	-648.5	816.6	809.5	7.11	114.886	
1,500.0	1,496.2	1,453.6	1,453.6	4.1	3.7	-15.72	-570.4	-649.0	803.1	795.6	7.56	106.245	
1,600.0	1,595.0	1,550.4	1,550.4	4.5	4.0	-15.88	-568.8	-650.2	787.5	779.4	8.09	97.288	
1,700.0	1,693.7	1,635.5	1,635.4	4.9	4.2	-15.88	-566.3	-653.1	772.7	764.1	8.61	89.785	
1,800.0	1,792.4	1,732.5	1,732.1	5.3	4.5	-15.72	-563.2	-659.1	759.5	750.4	9.15	82.988	
1,900.0	1,891.1	1,825.1	1,824.4	5.7	4.7	-15.48	-559.3	-665.4	746.3	736.6	9.70	76.960	
2,000.0	1,989.8	1,920.1	1,918.9	6.2	5.0	-15.07	-554.6	-673.9	734.1	723.8	10.26	71.521	
2,100.0	2,088.5	2,009.0	2,007.2	6.6	5.3	-14.60	-550.0	-683.2	723.0	712.1	10.82	66.802	
2,200.0	2,187.2	2,094.0	2,091.4	7.0	5.6	-14.04	-545.4	-693.7	713.3	701.9	11.38	62.672	
2,300.0	2,285.9	2,179.0	2,175.4	7.5	5.9	-13.38	-540.9	-705.8	705.1	693.2	11.95	59.008	
2,400.0	2,384.6	2,264.7	2,259.8	7.9	6.2	-12.61	-536.7	-720.3	699.5	687.0	12.53	55.809	
2,500.0	2,483.3	2,375.6	2,368.8	8.4	6.6	-11.50	-530.5	-740.0	694.1	680.9	13.20	52.584	
2,600.0	2,582.0	2,474.6	2,466.1	8.8	7.0	-10.48	-524.7	-757.4	688.8	674.9	13.84	49.781	
2,700.0	2,680.7	2,581.1	2,570.6	9.3	7.4	-9.24	-516.8	-776.3	682.8	668.3	14.52	47.039	
2,800.0	2,779.4	2,685.7	2,673.1	9.7	7.8	-7.93	-507.6	-794.6	676.2	661.0	15.19	44.507	
2,900.0	2,878.2	2,793.7	2,778.9	10.2	8.3	-6.44	-496.6	-813.1	668.9	653.0	15.90	42.070	
3,000.0	2,976.9	2,896.3	2,879.4	10.7	8.8	-4.88	-484.2	-830.2	660.6	644.0	16.60	39.794	
3,100.0	3,075.6	2,993.5	2,974.3	11.1	9.2	-3.30	-471.9	-847.1	653.1	635.8	17.28	37.787	
3,200.0	3,174.3	3,089.5	3,068.2	11.6	9.6	-1.76	-460.3	-863.2	645.8	627.8	17.95	35.984	
3,300.0	3,273.0	3,187.6	3,164.3	12.0	10.1	-0.23	-449.4	-879.8	639.6	621.0	18.61	34.367	
3,400.0	3,371.7	3,282.4	3,257.4	12.5	10.5	1.15	-440.1	-895.2	633.9	614.6	19.25	32.927	
3,500.0	3,470.4	3,381.2	3,354.4	13.0	10.9	2.51	-431.6	-911.2	629.0	609.1	19.90	31.610	
3,600.0	3,569.1	3,486.2	3,457.9	13.4	11.3	3.88	-423.3	-927.3	623.9	603.4	20.54	30.379	
3,700.0	3,667.8	3,591.5	3,561.9	13.9	11.7	5.15	-416.0	-941.9	618.1	597.0	21.18	29.185	
3,800.0	3,766.5	3,697.0	3,666.4	14.3	12.1	6.31	-409.6	-955.0	611.6	589.8	21.83	28.021	
3,900.0	3,865.2	3,802.7	3,771.3	14.8	12.6	7.36	-404.1	-966.6	604.2	581.7	22.47	26.884	
4,000.0	3,963.9	3,908.1	3,876.1	15.3	12.9	8.36	-399.1	-976.9	595.9	572.8	23.09	25.808	
4,100.0	4,062.6	4,013.0	3,980.5	15.7	13.3	9.31	-394.4	-985.8	586.8	563.1	23.70	24.762	
4,200.0	4,161.4	4,114.5	4,081.7	16.2	13.6	10.17	-390.5	-993.5	577.0	552.7	24.29	23.753	
4,300.0	4,260.1	4,223.7	4,190.5	16.7	13.9	11.06	-386.8	-1,000.7	566.6	541.7	24.90	22.754	
4,400.0	4,358.8	4,330.4	4,297.1	17.1	14.2	11.82	-384.0	-1,005.5	554.5	529.0	25.47	21.768	
4,500.0	4,457.5	4,436.9	4,403.5	17.6	14.4	12.48	-382.1	-1,008.6	541.1	515.1	26.05	20.773	
4,584.5	4,540.9	4,526.6	4,493.3	18.0	14.6	12.96	-381.1	-1,009.9	528.8	502.3	26.54	19.925	
4,600.0	4,556.2	4,543.0	4,509.7	18.1	14.7	13.03	-380.9	-1,010.0	526.5	499.9	26.63	19.769	
4,700.0	4,655.2	4,647.3	4,614.0	18.4	14.9	13.39	-380.4	-1,009.8	512.8	485.7	27.16	18.883	
4,800.0	4,754.7	4,751.3	4,717.9	18.6	15.1	13.65	-379.8	-1,008.7	501.6	474.0	27.64	18.150	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 15C-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,852.0	4,818.6	18.9	15.3	13.82	-379.2	-1,006.8	493.0	464.9	28.07	17.564	
5,000.0	4,954.4	4,945.0	4,911.6	19.1	15.5	13.96	-378.3	-1,005.8	488.6	460.1	28.44	17.177	
5,039.8	4,994.2	4,981.6	4,948.2	19.1	15.5	14.01	-378.0	-1,005.9	488.2	459.6	28.59	17.078	
5,045.6	5,000.0	4,987.0	4,953.6	19.1	15.6	-102.89	-377.9	-1,005.9	488.2	459.6	28.62	17.060	
5,100.0	5,054.4	5,040.5	5,007.1	19.2	15.7	-102.83	-377.5	-1,006.2	488.4	459.6	28.86	16.921	
5,200.0	5,154.4	5,144.2	5,110.8	19.4	15.9	-102.75	-376.8	-1,006.6	488.7	459.4	29.33	16.664	
5,300.0	5,254.4	5,246.0	5,212.5	19.6	16.1	-102.76	-376.8	-1,006.1	488.1	458.4	29.78	16.392	
5,400.0	5,354.4	5,346.3	5,312.8	19.8	16.3	-102.84	-377.3	-1,005.3	487.5	457.2	30.23	16.127	
5,500.0	5,454.4	5,447.1	5,413.6	19.9	16.5	-102.92	-377.8	-1,004.4	486.7	456.0	30.68	15.866	
5,600.0	5,554.4	5,548.9	5,515.4	20.1	16.7	-102.98	-378.1	-1,003.2	485.6	454.5	31.13	15.599	
5,700.0	5,654.4	5,649.3	5,615.8	20.3	16.9	-103.03	-378.1	-1,001.8	484.3	452.7	31.59	15.332	
5,800.0	5,754.4	5,749.2	5,715.7	20.5	17.1	-103.10	-378.4	-1,000.4	483.0	451.0	32.04	15.073	
5,900.0	5,854.4	5,847.9	5,814.4	20.7	17.3	-103.21	-379.1	-999.0	481.8	449.3	32.50	14.827	
6,000.0	5,954.4	5,946.5	5,913.0	20.9	17.5	-103.38	-380.3	-997.9	480.9	448.0	32.95	14.597	
6,100.0	6,054.4	6,044.7	6,011.2	21.0	17.7	-103.58	-381.8	-996.9	480.3	446.9	33.40	14.382	
6,185.5	6,139.8	6,128.4	6,094.8	21.2	17.9	-103.79	-383.5	-996.4	480.2	446.4	33.78	14.215	CC
6,200.0	6,154.4	6,142.8	6,109.3	21.2	17.9	-103.83	-383.8	-996.3	480.2	446.4	33.85	14.187	
6,300.0	6,254.4	6,241.3	6,207.7	21.4	18.1	-104.11	-386.1	-995.8	480.3	446.0	34.30	14.004	
6,400.0	6,354.4	6,341.0	6,307.5	21.6	18.4	-104.32	-387.9	-995.8	480.8	446.0	34.76	13.832	ES
6,500.0	6,454.4	6,438.0	6,404.4	21.8	18.6	-104.54	-389.9	-996.0	481.4	446.2	35.22	13.671	
6,609.3	6,563.6	6,545.3	6,511.7	22.0	18.8	-104.70	-391.5	-997.0	482.8	447.1	35.72	13.515	
6,650.0	6,604.4	6,585.6	6,552.0	22.1	18.9	-103.87	-392.2	-997.4	483.7	447.8	35.87	13.483	
6,700.0	6,654.2	6,634.0	6,600.4	22.2	19.0	-104.28	-393.0	-998.0	485.5	449.5	36.04	13.473	SF
6,750.0	6,703.6	6,680.9	6,647.3	22.3	19.1	-104.93	-393.8	-998.8	488.5	452.3	36.17	13.504	
6,800.0	6,752.4	6,728.7	6,695.1	22.3	19.2	-105.83	-394.5	-999.8	492.7	456.4	36.29	13.578	
6,850.0	6,800.4	6,773.5	6,739.8	22.4	19.4	-106.89	-395.3	-1,000.8	498.2	461.8	36.36	13.701	
6,900.0	6,847.4	6,809.7	6,776.0	22.4	19.4	-107.82	-396.9	-1,001.7	505.7	469.3	36.38	13.899	
6,950.0	6,893.2	6,839.5	6,805.6	22.4	19.5	-108.60	-399.7	-1,002.7	516.0	479.7	36.36	14.193	
7,000.0	6,937.6	6,868.0	6,833.8	22.4	19.6	-109.35	-403.9	-1,003.9	529.7	493.4	36.31	14.588	
7,050.0	6,980.3	6,891.5	6,856.9	22.4	19.6	-109.70	-408.3	-1,005.0	546.7	510.5	36.24	15.085	
7,100.0	7,021.3	6,916.2	6,880.9	22.4	19.7	-110.00	-413.7	-1,006.2	567.2	531.0	36.17	15.681	
7,150.0	7,060.4	6,951.2	6,914.8	22.4	19.7	-111.03	-422.4	-1,007.4	590.4	554.4	36.03	16.385	
7,200.0	7,097.3	6,966.9	6,929.9	22.4	19.7	-110.24	-426.7	-1,007.7	616.6	580.6	36.04	17.108	
7,250.0	7,131.9	6,978.7	6,941.1	22.4	19.8	-108.76	-430.2	-1,008.0	646.1	609.9	36.18	17.860	
7,300.0	7,164.0	6,997.0	6,958.5	22.4	19.8	-107.57	-436.0	-1,008.5	678.5	642.2	36.34	18.670	
7,350.0	7,193.7	6,997.0	6,958.5	22.4	19.8	-104.09	-436.0	-1,008.5	713.2	676.4	36.85	19.356	
7,400.0	7,220.6	6,997.0	6,958.5	22.5	19.8	-100.06	-436.0	-1,008.5	750.2	712.7	37.46	20.024	
7,450.0	7,244.7	6,997.0	6,958.5	22.6	19.8	-95.50	-436.0	-1,008.5	788.9	750.8	38.12	20.694	
7,500.0	7,265.8	6,997.0	6,958.5	22.7	19.8	-90.46	-436.0	-1,008.5	829.1	790.4	38.73	21.406	
7,550.0	7,284.0	6,997.0	6,958.5	22.9	19.8	-85.02	-436.0	-1,008.5	870.3	831.1	39.18	22.212	
7,600.0	7,299.1	6,997.0	6,958.5	23.1	19.8	-79.31	-436.0	-1,008.5	912.2	872.8	39.37	23.167	
7,650.0	7,311.1	6,997.0	6,958.5	23.4	19.8	-73.49	-436.0	-1,008.5	954.5	915.3	39.25	24.317	
7,700.0	7,319.8	6,997.0	6,958.5	23.9	19.8	-67.73	-436.0	-1,008.5	997.2	958.3	38.82	25.687	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 15N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-130.42	-574.7	-674.9	887.6				
100.0	100.0	58.4	58.4	0.1	0.1	-130.42	-574.7	-674.9	886.4	886.1	0.27	3,234.228	
200.0	200.0	160.0	160.0	0.4	0.4	-130.40	-574.2	-674.6	885.9	885.1	0.82	1,082.279	
300.0	300.0	256.4	256.4	0.7	0.7	-130.37	-573.7	-674.8	885.7	884.3	1.34	661.679	
310.5	310.5	266.5	266.5	0.7	0.7	-130.37	-573.6	-674.8	885.7	884.3	1.39	635.719	
400.0	400.0	354.8	354.8	1.0	0.9	-130.32	-573.2	-675.3	885.8	883.9	1.86	475.243	
500.0	500.0	456.4	456.3	1.2	1.2	-130.28	-572.7	-675.8	885.8	883.4	2.40	369.825	
600.0	600.0	556.3	556.3	1.5	1.4	-130.24	-572.2	-676.1	885.7	882.8	2.92	302.980	
610.6	610.6	566.6	566.6	1.5	1.4	-130.24	-572.1	-676.2	885.7	882.8	2.98	297.323	
700.0	700.0	653.1	653.0	1.8	1.7	-130.19	-571.7	-676.7	885.9	882.4	3.45	257.012	
800.0	800.0	751.9	751.9	2.1	1.9	-130.14	-571.4	-677.6	886.4	882.4	3.98	222.952	
900.0	900.0	854.0	854.0	2.3	2.2	-13.25	-571.5	-677.8	885.4	880.9	4.49	197.324	
1,000.0	999.9	953.0	952.9	2.5	2.4	-13.31	-571.6	-678.2	881.8	876.9	4.98	177.020	
1,100.0	1,099.7	1,051.8	1,051.8	2.8	2.7	-13.40	-571.6	-678.7	875.9	870.4	5.48	159.795	
1,200.0	1,199.3	1,151.9	1,151.8	3.1	2.9	-13.55	-571.6	-679.2	867.4	861.4	5.99	144.851	
1,300.0	1,298.6	1,246.0	1,246.0	3.4	3.2	-13.73	-571.5	-679.9	856.5	850.0	6.49	131.943	
1,400.0	1,397.5	1,321.0	1,320.9	3.7	3.4	-13.80	-571.0	-682.6	844.8	837.8	6.95	121.569	
1,414.8	1,412.1	1,321.0	1,320.9	3.8	3.4	-13.81	-571.0	-682.6	843.2	836.2	6.99	120.653	
1,500.0	1,496.2	1,401.6	1,401.2	4.1	3.6	-13.65	-569.4	-688.9	834.0	826.6	7.44	112.044	
1,600.0	1,595.0	1,497.0	1,495.8	4.5	3.9	-13.19	-566.4	-701.2	826.0	818.1	7.98	103.452	
1,700.0	1,693.7	1,570.6	1,568.3	4.9	4.2	-12.65	-563.0	-713.2	819.7	811.2	8.49	96.501	
1,800.0	1,792.4	1,664.7	1,660.9	5.3	4.5	-11.87	-558.0	-729.6	814.3	805.2	9.08	89.647	
1,900.0	1,891.1	1,763.9	1,758.4	5.7	4.9	-11.05	-553.0	-747.2	809.4	799.7	9.71	83.389	
2,000.0	1,989.8	1,868.1	1,860.8	6.2	5.3	-10.21	-548.1	-765.2	804.5	794.2	10.34	77.824	
2,100.0	2,088.5	1,975.8	1,967.2	6.6	5.6	-9.47	-543.8	-781.7	798.6	787.7	10.97	72.833	
2,200.0	2,187.2	2,075.3	2,065.6	7.0	6.0	-8.82	-540.1	-796.2	792.4	780.8	11.58	68.429	
2,300.0	2,285.9	2,173.2	2,162.2	7.5	6.4	-8.13	-536.1	-810.9	786.5	774.3	12.20	64.491	
2,400.0	2,384.6	2,264.1	2,251.9	7.9	6.7	-7.44	-532.2	-825.4	781.3	768.5	12.81	61.010	
2,500.0	2,483.3	2,379.3	2,365.6	8.4	7.2	-6.53	-526.7	-843.4	775.7	762.2	13.49	57.509	
2,600.0	2,582.0	2,479.6	2,464.8	8.8	7.6	-5.81	-522.2	-857.2	768.9	754.8	14.11	54.487	
2,700.0	2,680.7	2,571.7	2,555.8	9.3	8.0	-5.12	-518.2	-870.8	763.0	748.3	14.72	51.846	
2,800.0	2,779.4	2,667.8	2,650.6	9.7	8.4	-4.35	-513.9	-885.7	757.9	742.6	15.34	49.396	
2,900.0	2,878.2	2,758.8	2,740.3	10.2	8.8	-3.57	-509.7	-900.5	753.6	737.7	15.96	47.220	
3,000.0	2,976.9	2,854.2	2,834.1	10.7	9.2	-2.68	-504.9	-917.4	750.5	733.9	16.59	45.224	
3,100.0	3,075.6	2,958.3	2,936.5	11.1	9.6	-1.69	-499.6	-935.7	747.4	730.2	17.25	43.326	
3,200.0	3,174.3	3,064.0	3,040.5	11.6	10.1	-0.69	-494.0	-953.5	743.8	725.9	17.90	41.556	
3,300.0	3,273.0	3,171.5	3,146.6	12.0	10.5	0.26	-488.6	-970.0	739.3	720.7	18.55	39.856	
3,400.0	3,371.7	3,268.4	3,242.2	12.5	10.9	1.15	-483.2	-984.8	734.5	715.3	19.17	38.313	
3,500.0	3,470.4	3,365.6	3,338.1	13.0	11.4	2.06	-478.0	-999.9	730.3	710.5	19.79	36.907	
3,600.0	3,569.1	3,463.8	3,435.0	13.4	11.8	2.92	-473.6	-1,015.1	726.5	706.1	20.41	35.600	
3,700.0	3,667.8	3,562.8	3,532.8	13.9	12.2	3.73	-470.1	-1,030.1	723.0	702.0	21.03	34.381	
3,800.0	3,766.5	3,664.0	3,632.8	14.3	12.6	4.56	-466.4	-1,045.3	719.5	697.9	21.65	33.239	
3,900.0	3,865.2	3,764.1	3,731.6	14.8	13.0	5.43	-462.2	-1,060.3	716.0	693.7	22.26	32.157	
4,000.0	3,963.9	3,870.8	3,837.0	15.3	13.5	6.46	-456.6	-1,076.4	712.3	689.4	22.91	31.089	
4,100.0	4,062.6	3,953.9	3,919.1	15.7	13.8	7.22	-452.8	-1,088.9	708.9	685.5	23.48	30.196	
4,171.0	4,132.7	4,012.0	3,976.3	16.1	14.1	7.72	-450.9	-1,098.8	708.3	684.4	23.89	29.654	
4,200.0	4,161.4	4,035.9	3,999.7	16.2	14.2	7.95	-450.0	-1,103.1	708.4	684.3	24.05	29.453	
4,300.0	4,260.1	4,135.7	4,097.5	16.7	14.7	9.01	-445.1	-1,122.5	709.5	684.8	24.70	28.724	
4,400.0	4,358.8	4,241.9	4,201.7	17.1	15.2	10.21	-438.8	-1,142.5	710.1	684.7	25.37	27.988	
4,500.0	4,457.5	4,354.0	4,311.8	17.6	15.7	11.43	-432.1	-1,162.0	709.5	683.4	26.05	27.233	
4,584.5	4,540.9	4,436.8	4,393.5	18.0	16.1	12.26	-427.9	-1,175.1	708.1	681.5	26.58	26.637	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 15N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,600.0	4,556.2	4,450.3	4,406.7	18.1	16.1	12.38	-427.3	-1,177.3	708.0	681.3	26.68	26.540	
4,604.5	4,560.6	4,454.2	4,410.6	18.1	16.2	12.42	-427.1	-1,178.0	708.0	681.3	26.70	26.514	CC, ES
4,700.0	4,655.2	4,542.3	4,497.4	18.4	16.6	13.23	-423.4	-1,193.0	710.2	682.9	27.25	26.063	
4,800.0	4,754.7	4,649.3	4,602.6	18.6	17.1	14.20	-418.4	-1,211.4	716.0	688.2	27.83	25.728	
4,900.0	4,854.5	4,748.3	4,700.1	18.9	17.5	15.11	-412.6	-1,228.0	724.7	696.3	28.35	25.565	
5,000.0	4,954.4	4,854.1	4,804.3	19.1	18.0	16.01	-406.1	-1,245.2	736.2	707.4	28.83	25.535	
5,045.6	5,000.0	4,901.6	4,851.1	19.1	18.2	-100.53	-403.4	-1,252.6	742.4	713.4	29.03	25.575	
5,100.0	5,054.4	4,961.9	4,910.6	19.2	18.4	-100.15	-400.0	-1,261.6	749.9	720.6	29.33	25.564	
5,200.0	5,154.4	5,074.1	5,021.7	19.4	18.9	-99.53	-394.3	-1,276.7	762.4	732.5	29.89	25.503	
5,300.0	5,254.4	5,196.5	5,143.2	19.6	19.3	-98.97	-388.9	-1,290.0	772.3	741.8	30.46	25.353	
5,400.0	5,354.4	5,312.1	5,258.4	19.8	19.7	-98.63	-385.9	-1,299.6	780.2	749.2	30.99	25.176	
5,500.0	5,454.4	5,421.0	5,367.1	19.9	20.0	-98.47	-384.7	-1,306.4	786.2	754.7	31.48	24.971	
5,600.0	5,554.4	5,551.1	5,497.0	20.1	20.3	-98.36	-383.8	-1,311.1	789.6	757.6	32.01	24.664	
5,700.0	5,654.4	5,661.7	5,607.6	20.3	20.5	-98.38	-384.2	-1,311.9	790.4	757.9	32.48	24.331	
5,800.0	5,754.4	5,763.4	5,709.3	20.5	20.7	-98.42	-384.8	-1,312.0	790.6	757.6	32.93	24.007	
5,900.0	5,854.4	5,863.6	5,809.6	20.7	20.8	-98.49	-385.7	-1,312.0	790.6	757.3	33.38	23.688	
6,000.0	5,954.4	5,961.3	5,907.2	20.9	21.0	-98.58	-387.0	-1,312.1	790.9	757.1	33.82	23.388	
6,100.0	6,054.4	6,061.1	6,007.0	21.0	21.2	-98.69	-388.6	-1,312.3	791.4	757.1	34.26	23.096	
6,200.0	6,154.4	6,160.8	6,106.7	21.2	21.4	-98.82	-390.4	-1,312.4	791.8	757.1	34.71	22.810	
6,300.0	6,254.4	6,260.4	6,206.3	21.4	21.6	-98.86	-391.0	-1,312.8	792.3	757.1	35.17	22.529	
6,400.0	6,354.4	6,363.4	6,309.3	21.6	21.8	-98.95	-392.3	-1,313.0	792.6	757.0	35.63	22.245	
6,500.0	6,454.4	6,467.0	6,412.8	21.8	22.0	-99.09	-394.2	-1,312.6	792.6	756.5	36.09	21.959	
6,609.3	6,563.6	6,579.4	6,525.2	22.0	22.1	-99.27	-396.5	-1,311.6	792.0	755.4	36.60	21.641	
6,642.0	6,596.3	6,611.5	6,557.3	22.1	22.2	-98.42	-397.3	-1,311.3	791.8	755.1	36.73	21.558	
6,650.0	6,604.4	6,619.3	6,565.1	22.1	22.2	-98.47	-397.6	-1,311.2	791.9	755.1	36.76	21.541	
6,700.0	6,654.2	6,663.3	6,609.0	22.2	22.3	-98.86	-399.7	-1,310.6	792.3	755.4	36.91	21.464	
6,750.0	6,703.6	6,698.0	6,643.5	22.3	22.3	-99.38	-403.6	-1,310.4	794.1	757.1	37.02	21.454	SF
6,800.0	6,752.4	6,725.6	6,670.7	22.3	22.4	-99.85	-408.3	-1,310.4	797.7	760.7	37.07	21.518	
6,850.0	6,800.4	6,741.0	6,685.8	22.4	22.4	-99.92	-411.5	-1,310.5	803.6	766.5	37.10	21.661	
6,900.0	6,847.4	6,780.5	6,724.0	22.4	22.5	-100.88	-421.4	-1,311.3	811.2	774.1	37.11	21.860	
6,950.0	6,893.2	6,804.5	6,746.9	22.4	22.5	-101.20	-428.5	-1,311.9	821.4	784.3	37.10	22.140	
7,000.0	6,937.6	6,826.0	6,767.2	22.4	22.5	-101.32	-435.6	-1,312.6	834.1	797.0	37.09	22.490	
7,050.0	6,980.3	6,845.9	6,785.8	22.4	22.5	-101.23	-442.6	-1,313.4	849.4	812.3	37.07	22.911	
7,100.0	7,021.3	6,869.0	6,807.1	22.4	22.6	-101.17	-451.4	-1,314.3	867.3	830.2	37.07	23.395	
7,150.0	7,060.4	6,925.1	6,857.7	22.4	22.6	-103.10	-475.6	-1,313.9	887.2	850.2	36.95	24.010	
7,200.0	7,097.3	6,954.0	6,883.1	22.4	22.6	-103.24	-489.2	-1,312.0	908.9	872.0	36.93	24.611	
7,250.0	7,131.9	6,954.0	6,883.1	22.4	22.6	-101.19	-489.2	-1,312.0	933.3	896.1	37.13	25.134	
7,300.0	7,164.0	6,966.0	6,893.6	22.4	22.6	-99.69	-495.1	-1,311.0	960.0	922.7	37.35	25.702	
7,350.0	7,193.7	6,968.7	6,895.9	22.4	22.6	-97.24	-496.4	-1,310.8	989.0	951.3	37.71	26.227	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-140.97	-576.6	-467.4	743.4				
100.0	100.0	57.0	57.0	0.1	0.1	-140.97	-576.6	-467.4	742.2	741.9	0.27	2,757.047	
138.4	138.4	95.4	95.4	0.2	0.2	-140.97	-576.5	-467.4	742.2	741.7	0.48	1,549.653	
200.0	200.0	155.8	155.8	0.4	0.4	-140.96	-576.5	-467.5	742.2	741.4	0.81	918.474	
300.0	300.0	254.2	254.2	0.7	0.6	-140.94	-576.6	-467.9	742.6	741.2	1.33	556.669	
400.0	400.0	354.2	354.2	1.0	0.9	-140.92	-576.7	-468.3	742.9	741.0	1.86	400.065	
500.0	500.0	452.8	452.8	1.2	1.1	-140.89	-576.8	-468.9	743.4	741.0	2.38	311.994	
600.0	600.0	553.9	553.9	1.5	1.4	-140.83	-576.8	-469.9	744.0	741.1	2.92	255.042	
700.0	700.0	656.1	656.1	1.8	1.7	-140.75	-576.2	-470.8	744.1	740.6	3.46	215.136	
800.0	800.0	754.1	754.1	2.1	1.9	-140.65	-575.7	-471.9	744.4	740.4	3.99	186.733	
900.0	900.0	854.8	854.8	2.3	2.2	-23.71	-575.3	-473.0	743.6	739.1	4.49	165.473	
1,000.0	999.9	956.8	956.8	2.5	2.4	-23.76	-574.6	-474.1	740.1	735.1	4.99	148.293	
1,100.0	1,099.7	1,055.8	1,055.8	2.8	2.7	-23.94	-574.2	-474.7	734.2	728.7	5.49	133.848	
1,200.0	1,199.3	1,154.2	1,154.1	3.1	2.9	-24.23	-574.0	-475.3	726.1	720.1	5.99	121.180	
1,300.0	1,298.6	1,262.5	1,262.4	3.4	3.2	-24.67	-573.7	-475.9	715.5	709.0	6.53	109.525	
1,400.0	1,397.5	1,400.5	1,400.4	3.7	3.6	-25.48	-569.8	-472.6	698.8	691.7	7.16	97.554	
1,414.8	1,412.1	1,420.9	1,420.7	3.8	3.6	-25.64	-568.8	-471.5	695.7	688.4	7.26	95.855	
1,500.0	1,496.2	1,528.7	1,528.0	4.1	3.9	-26.49	-562.1	-463.4	675.3	667.5	7.79	86.711	
1,600.0	1,595.0	1,636.5	1,634.9	4.5	4.2	-27.60	-554.4	-452.2	649.3	640.9	8.37	77.527	
1,700.0	1,693.7	1,738.8	1,736.1	4.9	4.5	-28.93	-547.1	-439.0	622.0	613.0	8.96	69.429	
1,800.0	1,792.4	1,848.4	1,844.0	5.3	4.9	-30.70	-539.0	-422.2	593.5	583.9	9.59	61.863	
1,900.0	1,891.1	1,944.0	1,938.1	5.7	5.3	-32.46	-530.9	-406.4	564.0	553.8	10.21	55.225	
2,000.0	1,989.8	2,038.1	2,030.5	6.2	5.6	-34.40	-523.2	-390.8	535.2	524.3	10.85	49.336	
2,100.0	2,088.5	2,130.7	2,121.4	6.6	6.0	-36.53	-515.2	-375.1	506.5	495.0	11.52	43.987	
2,200.0	2,187.2	2,218.6	2,207.9	7.0	6.3	-38.70	-508.7	-361.3	480.1	467.9	12.19	39.381	
2,300.0	2,285.9	2,311.6	2,299.6	7.5	6.7	-41.21	-502.0	-347.0	454.9	442.0	12.92	35.198	
2,400.0	2,384.6	2,402.8	2,389.6	7.9	7.0	-43.83	-495.7	-333.8	431.3	417.6	13.68	31.520	
2,500.0	2,483.3	2,497.1	2,482.9	8.4	7.4	-46.75	-489.5	-321.0	409.4	394.9	14.49	28.245	
2,600.0	2,582.0	2,583.6	2,568.4	8.8	7.7	-49.69	-484.5	-309.3	389.4	374.1	15.31	25.440	
2,700.0	2,680.7	2,680.8	2,664.7	9.3	8.1	-53.29	-480.5	-296.6	372.3	356.1	16.23	22.940	
2,800.0	2,779.4	2,781.5	2,764.2	9.7	8.5	-57.59	-475.1	-281.8	355.6	338.4	17.24	20.628	
2,900.0	2,878.2	2,880.7	2,861.8	10.2	8.9	-62.48	-468.5	-265.5	339.6	321.3	18.30	18.557	
3,000.0	2,976.9	2,976.1	2,955.4	10.7	9.3	-67.77	-461.1	-248.8	325.3	305.8	19.41	16.758	
3,100.0	3,075.6	3,066.9	3,044.7	11.1	9.7	-73.04	-454.7	-233.5	314.5	294.1	20.47	15.367	
3,200.0	3,174.3	3,163.6	3,140.1	11.6	10.1	-78.68	-448.6	-218.6	307.6	286.1	21.52	14.292	
3,300.0	3,273.0	3,257.6	3,232.8	12.0	10.5	-84.21	-441.8	-205.1	302.7	280.3	22.49	13.460	
3,372.1	3,344.2	3,325.2	3,299.6	12.4	10.8	-88.17	-437.8	-195.6	302.0	278.9	23.14	13.050	CC
3,400.0	3,371.7	3,352.8	3,326.9	12.5	10.9	-89.78	-436.1	-191.8	302.1	278.7	23.39	12.916	ES
3,500.0	3,470.4	3,451.7	3,424.7	13.0	11.3	-95.50	-429.4	-178.6	303.6	279.4	24.21	12.541	
3,600.0	3,569.1	3,545.0	3,516.9	13.4	11.7	-100.81	-423.0	-166.3	307.9	283.0	24.92	12.358	SF
3,700.0	3,667.8	3,631.6	3,602.4	13.9	12.1	-105.74	-417.4	-153.1	316.8	291.3	25.55	12.400	
3,800.0	3,766.5	3,717.8	3,686.9	14.3	12.4	-110.66	-412.2	-137.3	331.1	305.0	26.09	12.690	
3,900.0	3,865.2	3,816.0	3,783.2	14.8	12.9	-115.89	-406.0	-118.8	348.6	322.1	26.56	13.124	
4,000.0	3,963.9	3,911.6	3,877.0	15.3	13.3	-120.41	-400.2	-101.6	368.0	341.1	26.96	13.649	
4,100.0	4,062.6	4,008.1	3,972.0	15.7	13.8	-124.44	-394.3	-85.3	388.5	361.2	27.33	14.217	
4,200.0	4,161.4	4,102.9	4,065.1	16.2	14.2	-128.06	-388.2	-68.9	410.9	383.3	27.67	14.850	
4,300.0	4,260.1	4,202.6	4,163.3	16.7	14.6	-131.44	-381.8	-52.8	433.9	405.9	28.00	15.494	
4,400.0	4,358.8	4,309.1	4,268.6	17.1	15.1	-134.44	-376.0	-37.9	456.4	428.0	28.33	16.107	
4,500.0	4,457.5	4,419.0	4,377.9	17.6	15.4	-136.85	-372.2	-26.4	477.0	448.3	28.69	16.625	
4,584.5	4,540.9	4,515.8	4,474.3	18.0	15.7	-138.55	-370.1	-19.7	492.2	463.2	29.01	16.969	
4,600.0	4,556.2	4,533.2	4,491.8	18.1	15.8	-138.86	-369.8	-18.8	494.8	465.7	29.06	17.024	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 16N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,700.0	4,655.2	4,647.1	4,605.6	18.4	16.0	-140.44	-368.6	-15.2	508.1	478.7	29.42	17.273	
4,800.0	4,754.7	4,751.3	4,709.7	18.6	16.3	-141.40	-367.9	-14.3	516.9	487.1	29.79	17.348	
4,900.0	4,854.5	4,852.1	4,810.6	18.9	16.5	-142.01	-367.4	-13.9	522.5	492.3	30.18	17.312	
5,000.0	4,954.4	4,953.0	4,911.4	19.1	16.7	-142.30	-367.1	-13.7	525.2	494.6	30.58	17.177	
5,045.6	5,000.0	4,998.8	4,957.3	19.1	16.7	100.77	-367.2	-13.8	525.5	494.6	30.91	17.001	
5,100.0	5,054.4	5,053.8	5,012.3	19.2	16.9	100.80	-367.4	-13.9	525.4	494.3	31.14	16.873	
5,200.0	5,154.4	5,155.8	5,114.3	19.4	17.0	100.83	-367.7	-14.3	525.1	493.5	31.56	16.636	
5,300.0	5,254.4	5,256.5	5,214.9	19.6	17.2	100.89	-368.0	-15.0	524.5	492.5	31.99	16.395	
5,400.0	5,354.4	5,359.2	5,317.6	19.8	17.4	100.98	-368.7	-16.2	523.5	491.0	32.42	16.144	
5,500.0	5,454.4	5,459.4	5,417.9	19.9	17.6	101.08	-369.4	-17.5	522.3	489.4	32.86	15.895	
5,600.0	5,554.4	5,559.7	5,518.1	20.1	17.8	101.15	-369.8	-18.9	521.0	487.7	33.29	15.651	
5,700.0	5,654.4	5,658.5	5,616.9	20.3	18.0	101.20	-370.0	-20.2	519.8	486.1	33.71	15.417	
5,800.0	5,754.4	5,758.6	5,717.0	20.5	18.2	101.24	-370.1	-21.2	518.7	484.6	34.15	15.191	
5,900.0	5,854.4	5,859.4	5,817.8	20.7	18.4	101.27	-370.2	-22.4	517.6	483.0	34.59	14.966	
6,000.0	5,954.4	5,960.8	5,919.2	20.9	18.6	101.29	-370.1	-23.9	516.2	481.1	35.03	14.735	
6,100.0	6,054.4	6,060.5	6,018.8	21.0	18.8	101.27	-369.6	-25.3	514.7	479.3	35.47	14.513	
6,200.0	6,154.4	6,159.8	6,118.2	21.2	19.0	101.22	-368.9	-26.6	513.3	477.4	35.90	14.296	
6,300.0	6,254.4	6,261.5	6,219.9	21.4	19.2	101.09	-367.5	-27.7	511.9	475.5	36.34	14.084	
6,400.0	6,354.4	6,362.6	6,320.9	21.6	19.4	100.92	-365.6	-29.2	510.1	473.3	36.79	13.867	
6,500.0	6,454.4	6,463.0	6,421.3	21.8	19.6	100.73	-363.6	-30.8	508.2	470.9	37.23	13.650	
6,609.3	6,563.6	6,573.7	6,532.0	22.0	19.8	100.47	-360.9	-32.5	506.0	468.3	37.71	13.419	
6,650.0	6,604.4	6,612.9	6,571.2	22.1	19.9	101.53	-360.2	-33.3	505.3	467.6	37.78	13.376	
6,670.0	6,624.4	6,631.2	6,589.5	22.2	20.0	101.66	-360.1	-33.6	505.3	467.4	37.87	13.343	
6,700.0	6,654.2	6,657.5	6,615.7	22.2	20.0	101.97	-360.3	-34.0	505.5	467.5	38.00	13.303	
6,750.0	6,703.6	6,701.0	6,659.1	22.3	20.1	102.93	-363.3	-34.6	507.1	468.9	38.22	13.269	
6,800.0	6,752.4	6,740.0	6,697.6	22.3	20.1	104.24	-369.1	-35.3	510.4	472.1	38.39	13.296	
6,850.0	6,800.4	6,743.0	6,700.6	22.4	20.1	103.87	-369.7	-35.4	517.3	479.0	38.31	13.503	
6,900.0	6,847.4	6,800.4	6,756.6	22.4	20.2	106.53	-382.5	-35.9	525.0	486.5	38.48	13.644	
6,950.0	6,893.2	6,826.6	6,781.8	22.4	20.2	107.38	-389.6	-35.5	537.2	498.8	38.41	13.984	
7,000.0	6,937.6	6,850.1	6,804.2	22.4	20.2	107.92	-396.5	-34.9	552.9	514.6	38.29	14.441	
7,050.0	6,980.3	6,870.8	6,823.9	22.4	20.3	108.07	-403.1	-34.1	572.1	534.0	38.11	15.011	
7,100.0	7,021.3	6,888.8	6,840.8	22.4	20.3	107.76	-409.2	-33.2	594.8	556.9	37.92	15.685	
7,150.0	7,060.4	6,904.2	6,855.1	22.4	20.3	106.95	-414.6	-32.3	620.8	583.1	37.75	16.445	
7,200.0	7,097.3	6,957.0	6,903.6	22.4	20.4	109.34	-435.2	-28.2	652.0	614.5	37.56	17.358	
7,250.0	7,131.9	6,957.0	6,903.6	22.4	20.4	106.54	-435.2	-28.2	682.9	645.4	37.53	18.197	
7,300.0	7,164.0	6,957.0	6,903.6	22.4	20.4	103.23	-435.2	-28.2	716.6	679.0	37.63	19.045	
7,350.0	7,193.7	6,957.0	6,903.6	22.4	20.4	99.41	-435.2	-28.2	752.6	714.8	37.84	19.891	
7,400.0	7,220.6	6,957.0	6,903.6	22.5	20.4	95.08	-435.2	-28.2	790.5	752.4	38.11	20.742	
7,450.0	7,244.7	6,957.0	6,903.6	22.6	20.4	90.31	-435.2	-28.2	829.9	791.5	38.37	21.629	
7,500.0	7,265.8	6,957.0	6,903.6	22.7	20.4	85.15	-435.2	-28.2	870.3	831.8	38.50	22.607	
7,550.0	7,284.0	6,957.0	6,903.6	22.9	20.4	79.72	-435.2	-28.2	911.6	873.2	38.40	23.739	
7,600.0	7,299.1	6,957.0	6,903.6	23.1	20.4	74.17	-435.2	-28.2	953.3	915.3	37.99	25.092	
7,650.0	7,311.1	6,957.0	6,903.6	23.4	20.4	68.64	-435.2	-28.2	995.4	958.2	37.24	26.726	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-139.35	-576.9	-495.3	761.6				
100.0	100.0	58.2	58.2	0.1	0.1	-139.35	-576.9	-495.3	760.3	760.0	0.27	2,782.194	
200.0	200.0	160.0	160.0	0.4	0.4	-139.35	-576.4	-495.0	759.8	759.0	0.82	931.206	
300.0	300.0	258.9	258.9	0.7	0.6	-139.34	-576.0	-494.8	759.4	758.0	1.34	568.321	
400.0	400.0	359.0	359.0	1.0	0.9	-139.35	-575.8	-494.4	758.9	757.1	1.86	407.551	
500.0	500.0	458.9	458.9	1.2	1.2	-139.34	-575.5	-494.3	758.6	756.2	2.39	317.084	
600.0	600.0	559.2	559.2	1.5	1.4	-139.34	-575.1	-494.0	758.1	755.2	2.92	259.279	
700.0	700.0	658.2	658.2	1.8	1.7	-139.34	-574.9	-493.8	757.8	754.4	3.45	219.560	
800.0	800.0	758.4	758.4	2.1	1.9	-139.37	-574.9	-493.3	757.5	753.6	3.98	190.226	
900.0	900.0	857.4	857.3	2.3	2.2	-22.49	-574.6	-493.2	756.0	751.5	4.49	168.460	
1,000.0	999.9	956.0	956.0	2.5	2.4	-22.59	-574.3	-493.6	752.5	747.5	4.98	151.154	
1,100.0	1,099.7	1,094.2	1,094.2	2.8	2.8	-22.83	-571.8	-492.9	745.1	739.5	5.59	133.275	
1,200.0	1,199.3	1,222.7	1,222.2	3.1	3.1	-22.89	-561.9	-490.9	729.8	723.6	6.20	117.795	
1,300.0	1,298.6	1,336.2	1,334.7	3.4	3.5	-22.57	-546.4	-491.6	709.1	702.4	6.78	104.587	
1,400.0	1,397.5	1,453.3	1,449.9	3.7	3.9	-22.05	-525.9	-492.6	683.3	675.9	7.41	92.179	
1,414.8	1,412.1	1,470.3	1,466.6	3.8	4.0	-21.97	-522.6	-492.6	679.1	671.6	7.51	90.468	
1,500.0	1,496.2	1,567.7	1,561.9	4.1	4.4	-21.31	-502.6	-492.2	653.3	645.3	8.05	81.160	
1,600.0	1,595.0	1,652.7	1,644.9	4.5	4.7	-20.63	-484.3	-491.7	622.4	613.8	8.62	72.226	
1,700.0	1,693.7	1,745.6	1,735.9	4.9	5.1	-19.84	-465.5	-492.0	593.1	583.9	9.21	64.406	
1,800.0	1,792.4	1,841.0	1,829.4	5.3	5.5	-19.00	-446.4	-491.7	563.5	553.7	9.82	57.359	
1,900.0	1,891.1	1,927.4	1,914.2	5.7	5.8	-18.27	-430.1	-491.3	534.9	524.5	10.41	51.393	
2,000.0	1,989.8	2,022.6	2,008.0	6.2	6.2	-17.53	-413.9	-490.6	507.4	496.4	11.02	46.049	
2,100.0	2,088.5	2,110.5	2,094.8	6.6	6.6	-16.90	-400.3	-489.9	481.0	469.4	11.60	41.446	
2,200.0	2,187.2	2,201.3	2,184.6	7.0	6.9	-16.18	-386.9	-490.1	455.9	443.7	12.20	37.358	
2,300.0	2,285.9	2,289.3	2,271.9	7.5	7.2	-15.53	-375.7	-490.8	432.6	419.8	12.79	33.831	
2,400.0	2,384.6	2,377.1	2,359.3	7.9	7.5	-15.11	-367.4	-491.6	411.5	398.1	13.35	30.829	
2,500.0	2,483.3	2,465.8	2,447.9	8.4	7.8	-14.99	-362.0	-492.4	392.7	378.8	13.90	28.256	
2,600.0	2,582.0	2,556.9	2,538.9	8.8	8.0	-15.18	-359.5	-493.3	376.1	361.7	14.42	26.077	
2,700.0	2,680.7	2,655.2	2,637.2	9.3	8.2	-15.73	-359.0	-493.9	360.8	345.8	14.95	24.124	
2,800.0	2,779.4	2,755.4	2,737.4	9.7	8.4	-16.26	-357.8	-494.4	344.8	329.3	15.50	22.249	
2,900.0	2,878.2	2,852.2	2,834.2	10.2	8.6	-16.85	-356.8	-494.8	329.1	313.1	16.04	20.521	
3,000.0	2,976.9	2,949.3	2,931.3	10.7	8.9	-17.65	-356.9	-495.1	314.0	297.5	16.58	18.944	
3,100.0	3,075.6	3,048.1	3,030.1	11.1	9.1	-18.57	-357.2	-495.5	299.3	282.2	17.13	17.476	
3,200.0	3,174.3	3,147.3	3,129.3	11.6	9.3	-19.80	-358.2	-495.1	284.6	266.9	17.68	16.093	
3,300.0	3,273.0	3,246.1	3,228.1	12.0	9.5	-21.39	-359.8	-493.7	269.8	251.5	18.25	14.786	
3,400.0	3,371.7	3,342.0	3,324.0	12.5	9.7	-23.08	-361.5	-492.8	255.6	236.8	18.82	13.582	
3,500.0	3,470.4	3,437.9	3,419.8	13.0	9.9	-24.77	-363.8	-493.3	243.1	223.7	19.42	12.521	
3,600.0	3,569.1	3,538.9	3,520.8	13.4	10.1	-26.60	-366.1	-494.4	231.1	211.1	20.05	11.530	
3,700.0	3,667.8	3,640.7	3,622.6	13.9	10.3	-28.82	-367.7	-494.3	218.1	197.4	20.71	10.529	
3,800.0	3,766.5	3,740.3	3,722.1	14.3	10.5	-31.30	-368.6	-493.6	204.5	183.1	21.41	9.554	
3,900.0	3,865.2	3,839.8	3,821.6	14.8	10.7	-34.05	-369.0	-492.9	191.0	168.8	22.14	8.626	
4,000.0	3,963.9	3,938.0	3,919.9	15.3	11.0	-37.07	-369.0	-492.4	177.6	154.7	22.91	7.753	
4,100.0	4,062.6	4,036.3	4,018.2	15.7	11.2	-40.41	-369.3	-492.4	165.3	141.6	23.74	6.965	
4,200.0	4,161.4	4,135.2	4,117.0	16.2	11.4	-44.33	-369.5	-492.4	153.7	129.0	24.63	6.238	
4,300.0	4,260.1	4,233.4	4,215.3	16.7	11.7	-48.84	-369.9	-492.3	142.9	117.3	25.60	5.583	
4,400.0	4,358.8	4,332.1	4,313.9	17.1	11.9	-54.14	-370.6	-492.1	133.4	106.8	26.65	5.007	
4,500.0	4,457.5	4,430.6	4,412.4	17.6	12.1	-60.10	-371.3	-492.0	125.4	97.6	27.76	4.516	
4,584.5	4,540.9	4,513.7	4,495.5	18.0	12.3	-65.62	-372.1	-492.1	120.0	91.2	28.72	4.177	
4,600.0	4,556.2	4,528.9	4,510.7	18.1	12.3	-66.65	-372.3	-492.1	119.1	90.3	28.88	4.125	
4,700.0	4,655.2	4,626.9	4,608.7	18.4	12.6	-72.85	-373.8	-491.7	115.9	86.1	29.82	3.887	
4,746.8	4,701.7	4,672.9	4,654.7	18.5	12.7	-75.58	-374.8	-491.0	115.6	85.4	30.21	3.828	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 37N-29HZ (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,754.7	4,726.0	4,707.8	18.6	12.8	-78.30	-376.0	-490.1	115.9	85.2	30.61	3.785	
4,900.0	4,854.5	4,826.1	4,807.8	18.9	13.0	-81.94	-378.0	-488.8	117.1	85.8	31.23	3.748	
5,000.0	4,954.4	4,926.9	4,908.7	19.1	13.3	-83.88	-379.6	-487.6	118.5	86.8	31.73	3.734	
5,045.6	5,000.0	4,972.9	4,954.7	19.1	13.4	158.80	-380.0	-487.0	119.1	87.1	31.91	3.731	
5,100.0	5,054.4	5,027.5	5,009.2	19.2	13.5	158.49	-380.3	-486.2	119.6	87.4	32.15	3.720	
5,200.0	5,154.4	5,127.8	5,109.5	19.4	13.7	158.03	-380.8	-484.9	120.5	87.9	32.59	3.698	
5,300.0	5,254.4	5,228.0	5,209.7	19.6	14.0	157.82	-381.1	-484.3	121.1	88.1	33.03	3.666	
5,400.0	5,354.4	5,327.9	5,309.6	19.8	14.2	157.81	-381.7	-484.0	121.7	88.2	33.46	3.637	
5,500.0	5,454.4	5,429.0	5,410.7	19.9	14.5	158.02	-382.0	-484.4	121.9	88.0	33.89	3.597	
5,600.0	5,554.4	5,529.1	5,510.8	20.1	14.7	158.42	-382.1	-485.3	121.6	87.3	34.31	3.544	
5,700.0	5,654.4	5,629.5	5,611.2	20.3	15.0	158.49	-381.8	-485.6	121.2	86.5	34.74	3.488	
5,800.0	5,754.4	5,730.0	5,711.7	20.5	15.2	157.93	-380.4	-484.9	120.2	85.0	35.20	3.414	
5,900.0	5,854.4	5,830.1	5,811.8	20.7	15.5	157.69	-379.1	-484.8	119.1	83.4	35.65	3.340	
6,000.0	5,954.4	5,930.5	5,912.1	20.9	15.7	157.42	-377.7	-484.8	117.7	81.6	36.10	3.261	
6,100.0	6,054.4	6,030.2	6,011.8	21.0	16.0	156.84	-376.0	-484.2	116.4	79.8	36.56	3.183	
6,200.0	6,154.4	6,129.9	6,111.6	21.2	16.2	156.49	-374.7	-484.0	115.3	78.2	37.02	3.114	
6,300.0	6,254.4	6,229.8	6,211.5	21.4	16.5	156.43	-373.7	-484.3	114.3	76.8	37.47	3.049	
6,400.0	6,354.4	6,329.6	6,311.3	21.6	16.7	156.83	-373.3	-485.4	113.4	75.5	37.92	2.991	
6,500.0	6,454.4	6,429.6	6,411.3	21.8	17.0	157.31	-372.9	-486.5	112.6	74.3	38.36	2.937	
6,609.3	6,563.6	6,538.4	6,520.0	22.0	17.3	157.85	-372.6	-487.8	111.9	73.0	38.84	2.881	
6,611.7	6,566.1	6,540.8	6,522.4	22.0	17.3	158.82	-372.6	-487.8	111.9	73.0	38.87	2.878	CC, ES, SF
6,650.0	6,604.4	6,576.8	6,558.4	22.1	17.4	159.07	-372.8	-488.0	113.0	74.0	39.00	2.897	
6,700.0	6,654.2	6,617.7	6,599.2	22.2	17.5	159.58	-374.8	-487.3	119.7	80.7	39.02	3.067	
6,750.0	6,703.6	6,654.0	6,635.2	22.3	17.5	160.40	-379.6	-486.2	133.3	94.5	38.86	3.431	
6,800.0	6,752.4	6,692.4	6,672.8	22.3	17.6	161.67	-387.4	-485.1	153.3	114.8	38.53	3.980	
6,850.0	6,800.4	6,725.7	6,704.9	22.4	17.6	162.85	-396.2	-484.2	178.8	140.8	38.01	4.703	
6,900.0	6,847.4	6,756.3	6,733.9	22.4	17.6	163.83	-405.8	-483.4	209.1	171.8	37.33	5.603	
6,950.0	6,893.2	6,782.0	6,758.0	22.4	17.7	164.37	-414.8	-482.7	243.6	207.0	36.50	6.672	
7,000.0	6,937.6	6,810.1	6,784.0	22.4	17.7	164.90	-425.4	-481.9	281.2	245.7	35.52	7.917	
7,050.0	6,980.3	6,832.5	6,804.5	22.4	17.7	164.93	-434.4	-481.2	321.7	287.3	34.43	9.345	
7,100.0	7,021.3	6,851.5	6,821.8	22.4	17.7	164.55	-442.4	-480.6	364.6	331.4	33.24	10.970	
7,150.0	7,060.4	6,867.0	6,835.7	22.4	17.8	163.65	-449.1	-480.2	409.4	377.4	31.99	12.797	
7,200.0	7,097.3	6,879.0	6,846.4	22.4	17.8	161.94	-454.4	-479.8	455.9	425.1	30.78	14.812	
7,250.0	7,131.9	6,887.9	6,854.3	22.4	17.8	158.96	-458.5	-479.6	503.6	473.8	29.76	16.924	
7,300.0	7,164.0	6,894.3	6,860.0	22.4	17.8	153.57	-461.5	-479.3	552.3	523.0	29.33	18.829	
7,350.0	7,193.7	6,898.4	6,863.6	22.4	17.8	142.63	-463.5	-479.2	601.6	571.0	30.63	19.643	
7,400.0	7,220.6	6,910.0	6,873.8	22.5	17.8	124.57	-469.0	-478.7	651.5	617.2	34.24	19.025	
7,450.0	7,244.7	6,910.0	6,873.8	22.6	17.8	76.99	-469.0	-478.7	701.3	664.5	36.83	19.042	
7,500.0	7,265.8	6,899.1	6,864.2	22.7	17.8	34.49	-463.8	-479.1	751.0	725.7	25.29	29.698	
7,550.0	7,284.0	6,896.0	6,861.5	22.9	17.8	21.17	-462.3	-479.3	800.5	780.8	19.71	40.609	
7,600.0	7,299.1	6,891.5	6,857.5	23.1	17.8	14.74	-460.2	-479.4	849.6	833.2	16.43	51.698	
7,650.0	7,311.1	6,885.7	6,852.4	23.4	17.8	11.08	-457.5	-479.6	898.0	883.9	14.13	63.562	
7,700.0	7,319.8	6,878.7	6,846.2	23.9	17.8	8.76	-454.3	-479.9	945.7	933.3	12.43	76.062	
7,750.0	7,325.3	6,867.0	6,835.7	24.3	17.8	7.10	-449.1	-480.2	992.5	981.2	11.29	87.942	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-142.83	-575.8	-436.6	723.9				
100.0	100.0	57.4	57.4	0.1	0.1	-142.83	-575.9	-436.6	722.7	722.4	0.27	2,659.014	
200.0	200.0	155.6	155.6	0.4	0.4	-142.86	-576.2	-436.5	722.9	722.1	0.81	894.680	
300.0	300.0	253.9	253.9	0.7	0.6	-142.86	-576.7	-436.7	723.3	722.0	1.33	542.771	
400.0	400.0	353.2	353.2	1.0	0.9	-142.88	-577.3	-436.9	724.0	722.1	1.86	388.668	
500.0	500.0	453.1	453.0	1.2	1.2	-142.89	-577.9	-437.2	724.6	722.3	2.39	302.820	
600.0	600.0	552.2	552.2	1.5	1.4	-142.89	-578.4	-437.6	725.4	722.4	2.92	248.205	
700.0	700.0	651.2	651.1	1.8	1.7	-142.91	-579.3	-438.0	726.3	722.8	3.45	210.405	
800.0	800.0	750.9	750.9	2.1	1.9	-142.91	-580.0	-438.5	727.2	723.2	3.98	182.607	
900.0	900.0	850.3	850.3	2.3	2.2	-26.03	-580.8	-439.4	727.1	722.6	4.49	162.032	
1,000.0	999.9	952.8	952.7	2.5	2.4	-26.19	-581.5	-439.9	724.5	719.5	4.98	145.396	
1,100.0	1,099.7	1,054.9	1,054.9	2.8	2.7	-26.46	-582.0	-440.2	719.2	713.7	5.48	131.122	
1,200.0	1,199.3	1,180.7	1,180.6	3.1	3.0	-27.08	-581.5	-437.7	709.5	703.4	6.06	116.996	
1,300.0	1,298.6	1,298.8	1,298.4	3.4	3.3	-28.12	-579.8	-430.5	694.3	687.7	6.64	104.508	
1,400.0	1,397.5	1,412.1	1,411.3	3.7	3.6	-29.52	-577.1	-420.2	674.6	667.4	7.23	93.270	
1,414.8	1,412.1	1,428.6	1,427.7	3.8	3.7	-29.77	-576.6	-418.4	671.4	664.0	7.32	91.700	
1,500.0	1,496.2	1,523.5	1,521.9	4.1	4.0	-31.15	-573.5	-406.9	651.6	643.7	7.84	83.083	
1,600.0	1,595.0	1,627.5	1,624.7	4.5	4.3	-32.84	-568.6	-392.7	626.8	618.4	8.46	74.054	
1,700.0	1,693.7	1,725.4	1,721.5	4.9	4.6	-34.60	-563.9	-378.8	602.2	593.1	9.09	66.264	
1,800.0	1,792.4	1,824.3	1,819.1	5.3	5.0	-36.67	-559.2	-363.3	577.5	567.7	9.76	59.168	
1,900.0	1,891.1	1,919.0	1,912.3	5.7	5.3	-38.99	-555.1	-346.8	553.2	542.7	10.45	52.941	
2,000.0	1,989.8	2,017.7	2,009.2	6.2	5.7	-41.67	-550.7	-329.0	529.5	518.3	11.20	47.281	
2,100.0	2,088.5	2,116.3	2,105.9	6.6	6.2	-44.70	-545.6	-310.0	506.0	494.0	12.03	42.074	
2,200.0	2,187.2	2,206.5	2,194.1	7.0	6.6	-47.78	-541.3	-292.0	484.0	471.2	12.86	37.643	
2,300.0	2,285.9	2,300.3	2,285.9	7.5	7.0	-51.31	-537.2	-272.9	464.0	450.3	13.77	33.709	
2,400.0	2,384.6	2,396.1	2,379.5	7.9	7.5	-55.22	-532.7	-253.2	445.7	431.0	14.74	30.247	
2,500.0	2,483.3	2,490.8	2,472.1	8.4	7.9	-59.34	-527.7	-233.8	429.2	413.5	15.72	27.300	
2,600.0	2,582.0	2,580.7	2,560.1	8.8	8.3	-63.37	-523.0	-216.4	415.2	398.5	16.68	24.892	
2,700.0	2,680.7	2,673.0	2,650.7	9.3	8.7	-67.72	-519.1	-198.7	404.7	387.1	17.67	22.899	
2,800.0	2,779.4	2,767.7	2,743.5	9.7	9.2	-72.34	-514.9	-180.6	396.9	378.2	18.68	21.246	
2,900.0	2,878.2	2,862.5	2,836.5	10.2	9.6	-77.09	-510.5	-162.6	391.8	372.2	19.67	19.920	
2,998.7	2,975.6	2,952.4	2,924.6	10.6	10.0	-81.73	-506.4	-145.1	390.0	369.4	20.61	18.919	CC
3,000.0	2,976.9	2,953.6	2,925.8	10.7	10.1	-81.79	-506.4	-144.8	390.0	369.4	20.63	18.908	ES
3,100.0	3,075.6	3,048.2	3,018.5	11.1	10.5	-86.68	-502.2	-126.3	391.5	370.0	21.53	18.186	
3,200.0	3,174.3	3,143.9	3,112.5	11.6	10.9	-91.32	-498.4	-109.3	395.7	373.3	22.35	17.707	
3,300.0	3,273.0	3,238.9	3,206.0	12.0	11.4	-95.77	-494.7	-92.6	402.5	379.4	23.10	17.424	
3,400.0	3,371.7	3,338.3	3,303.8	12.5	11.8	-100.26	-490.2	-75.7	411.1	387.3	23.81	17.269	
3,500.0	3,470.4	3,435.6	3,399.7	13.0	12.2	-104.46	-485.0	-60.0	421.2	396.7	24.43	17.237	SF
3,600.0	3,569.1	3,529.6	3,492.4	13.4	12.6	-108.26	-480.2	-45.2	433.1	408.1	25.00	17.325	
3,700.0	3,667.8	3,621.4	3,582.9	13.9	13.0	-111.75	-476.0	-30.6	447.6	422.0	25.53	17.534	
3,800.0	3,766.5	3,711.3	3,671.6	14.3	13.4	-114.83	-473.1	-16.3	464.5	438.5	26.01	17.856	
3,900.0	3,865.2	3,805.0	3,764.2	14.8	13.8	-117.68	-471.6	-1.7	483.5	457.0	26.48	18.260	
4,000.0	3,963.9	3,894.8	3,852.9	15.3	14.2	-120.18	-470.6	12.6	504.3	477.3	26.94	18.721	
4,100.0	4,062.6	3,978.3	3,934.9	15.7	14.6	-122.53	-469.0	27.9	527.7	500.3	27.38	19.269	
4,200.0	4,161.4	4,070.1	4,024.8	16.2	15.1	-125.07	-466.3	46.4	553.3	525.4	27.83	19.883	
4,300.0	4,260.1	4,161.3	4,113.9	16.7	15.5	-127.49	-462.9	65.6	580.3	552.0	28.25	20.540	
4,400.0	4,358.8	4,252.9	4,203.3	17.1	16.0	-129.77	-459.0	85.3	608.6	579.9	28.68	21.222	
4,500.0	4,457.5	4,347.7	4,295.7	17.6	16.6	-131.96	-454.7	105.8	637.8	608.7	29.10	21.920	
4,584.5	4,540.9	4,431.7	4,377.7	18.0	17.0	-133.80	-450.0	123.7	662.6	633.1	29.45	22.501	
4,600.0	4,556.2	4,446.7	4,392.2	18.1	17.1	-134.18	-449.2	126.8	667.1	637.6	29.50	22.614	
4,700.0	4,655.2	4,543.9	4,487.2	18.4	17.6	-136.40	-443.4	146.8	695.0	665.2	29.80	23.320	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38C-29HC (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,754.7	4,639.7	4,580.9	18.6	18.1	-138.20	-437.7	166.2	720.6	690.4	30.13	23.919	
4,900.0	4,854.5	4,735.6	4,674.6	18.9	18.6	-139.67	-432.1	185.7	744.0	713.6	30.47	24.418	
5,000.0	4,954.4	4,834.5	4,771.3	19.1	19.1	-140.87	-426.5	205.5	765.1	734.2	30.83	24.814	
5,045.6	5,000.0	4,879.9	4,815.8	19.1	19.3	101.76	-424.0	214.6	773.7	742.6	31.17	24.820	
5,100.0	5,054.4	4,934.6	4,869.2	19.2	19.6	101.36	-420.8	225.4	783.7	752.3	31.40	24.955	
5,200.0	5,154.4	5,036.0	4,968.5	19.4	20.1	100.65	-414.8	245.2	801.8	770.0	31.83	25.192	
5,300.0	5,254.4	5,143.9	5,074.3	19.6	20.6	99.93	-408.2	265.6	819.4	787.1	32.27	25.391	
5,400.0	5,354.4	5,245.3	5,174.0	19.8	21.1	99.35	-403.0	283.4	835.9	803.2	32.71	25.560	
5,500.0	5,454.4	5,340.7	5,267.8	19.9	21.5	98.92	-399.3	300.2	852.7	819.5	33.14	25.730	
5,600.0	5,554.4	5,437.2	5,362.7	20.1	22.0	98.48	-395.4	317.4	869.8	836.2	33.58	25.900	
5,700.0	5,654.4	5,547.5	5,471.1	20.3	22.5	97.94	-389.9	337.1	886.8	852.7	34.06	26.038	
5,800.0	5,754.4	5,656.4	5,578.5	20.5	23.0	97.44	-384.5	354.1	901.6	867.1	34.53	26.113	
5,900.0	5,854.4	5,751.4	5,672.2	20.7	23.4	97.03	-379.9	369.1	916.7	881.8	34.97	26.213	
6,000.0	5,954.4	5,877.5	5,796.7	20.9	23.9	96.52	-373.9	387.7	930.8	895.4	35.49	26.230	
6,100.0	6,054.4	6,009.5	5,927.8	21.0	24.4	96.09	-368.4	402.4	941.5	905.5	36.01	26.146	
6,200.0	6,154.4	6,129.2	6,047.1	21.2	24.7	95.77	-364.3	412.3	949.3	912.9	36.50	26.010	
6,300.0	6,254.4	6,245.3	6,162.8	21.4	25.1	95.53	-361.0	419.7	955.4	918.4	36.98	25.836	
6,400.0	6,354.4	6,356.1	6,273.5	21.6	25.3	95.34	-358.3	425.0	959.9	922.5	37.45	25.633	
6,500.0	6,454.4	6,469.2	6,386.5	21.8	25.6	95.21	-356.4	428.9	963.2	925.3	37.92	25.400	
6,609.3	6,563.6	6,587.0	6,504.3	22.0	25.8	95.13	-355.3	431.7	965.7	927.3	38.43	25.130	
6,650.0	6,604.4	6,631.1	6,548.4	22.1	25.9	96.10	-355.5	432.4	966.5	928.1	38.45	25.138	
6,700.0	6,654.2	6,683.6	6,600.8	22.2	26.0	96.31	-355.8	433.1	967.6	929.0	38.67	25.026	
6,750.0	6,703.6	6,736.3	6,653.6	22.3	26.1	96.70	-356.4	433.6	969.0	930.1	38.88	24.922	
6,800.0	6,752.4	6,788.9	6,706.1	22.3	26.2	97.27	-356.9	433.8	970.7	931.6	39.09	24.830	
6,850.0	6,800.4	6,834.2	6,751.5	22.4	26.3	97.89	-357.7	434.0	972.9	933.6	39.26	24.782	
6,900.0	6,847.4	6,874.7	6,791.9	22.4	26.3	98.54	-359.3	434.2	976.0	936.6	39.38	24.785	
6,950.0	6,893.2	6,907.3	6,824.3	22.4	26.4	99.14	-362.6	434.3	980.5	941.0	39.43	24.864	
7,000.0	6,937.6	6,939.8	6,856.4	22.4	26.4	99.81	-368.0	434.4	986.6	947.2	39.45	25.007	
7,050.0	6,980.3	6,973.8	6,889.5	22.4	26.5	100.60	-375.9	434.2	994.6	955.1	39.44	25.216	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 17-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-144.85	-576.6	-405.9	706.3				
100.0	100.0	61.5	61.5	0.1	0.1	-144.84	-576.5	-406.0	705.1	704.8	0.28	2,492.794	
200.0	200.0	161.9	161.9	0.4	0.4	-144.76	-575.6	-406.6	704.7	703.9	0.83	850.383	
300.0	300.0	261.9	261.8	0.7	0.7	-144.64	-574.6	-407.7	704.6	703.2	1.36	516.828	
400.0	400.0	364.1	364.1	1.0	0.9	-144.51	-573.3	-408.7	704.1	702.2	1.90	370.124	
500.0	500.0	463.9	463.8	1.2	1.2	-144.36	-571.7	-410.0	703.5	701.1	2.44	288.064	
600.0	600.0	564.5	564.4	1.5	1.5	-144.18	-570.0	-411.4	703.0	700.0	2.98	236.014	
700.0	700.0	666.8	666.7	1.8	1.7	-144.03	-568.3	-412.4	702.2	698.7	3.51	200.075	
800.0	800.0	768.0	767.9	2.1	2.0	-143.88	-566.3	-413.2	701.1	697.1	4.04	173.424	
900.0	900.0	867.7	867.5	2.3	2.3	-26.89	-564.4	-414.0	698.8	694.3	4.56	153.084	
1,000.0	999.9	966.8	966.6	2.5	2.5	-26.92	-562.5	-414.9	694.3	689.2	5.06	137.341	
1,100.0	1,099.7	1,080.1	1,079.9	2.8	2.8	-27.14	-560.4	-415.0	687.1	681.5	5.59	122.925	
1,200.0	1,199.3	1,199.7	1,199.4	3.1	3.1	-27.91	-557.6	-409.4	674.4	668.2	6.15	109.639	
1,300.0	1,298.6	1,314.8	1,314.0	3.4	3.4	-29.11	-554.2	-399.8	656.9	650.2	6.72	97.797	
1,400.0	1,397.5	1,425.1	1,423.4	3.7	3.7	-30.77	-550.3	-387.0	635.0	627.7	7.29	87.053	
1,414.8	1,412.1	1,442.9	1,441.1	3.8	3.8	-31.08	-549.6	-384.6	631.5	624.1	7.39	85.470	
1,500.0	1,496.2	1,540.1	1,536.9	4.1	4.1	-32.87	-545.1	-369.4	609.5	601.6	7.93	76.866	
1,600.0	1,595.0	1,642.3	1,637.4	4.5	4.5	-35.11	-539.7	-350.9	582.5	573.9	8.58	67.917	
1,700.0	1,693.7	1,734.4	1,727.5	4.9	4.9	-37.41	-534.8	-333.1	555.8	546.6	9.23	60.215	
1,800.0	1,792.4	1,829.9	1,820.9	5.3	5.3	-40.20	-530.7	-313.2	530.4	520.5	9.96	53.269	
1,900.0	1,891.1	1,929.9	1,918.3	5.7	5.7	-43.48	-525.7	-291.5	505.4	494.6	10.77	46.929	
2,000.0	1,989.8	2,014.8	2,001.2	6.2	6.1	-46.48	-521.4	-273.4	482.1	470.5	11.54	41.773	
2,100.0	2,088.5	2,101.2	2,085.5	6.6	6.5	-49.85	-518.5	-254.8	462.0	449.6	12.38	37.321	
2,200.0	2,187.2	2,190.9	2,173.1	7.0	6.9	-53.61	-516.6	-235.5	445.2	431.9	13.29	33.498	
2,300.0	2,285.9	2,290.6	2,270.4	7.5	7.4	-58.03	-513.7	-214.2	430.1	415.8	14.31	30.055	
2,400.0	2,384.6	2,382.5	2,360.1	7.9	7.9	-62.41	-510.7	-194.2	417.3	402.0	15.33	27.221	
2,500.0	2,483.3	2,475.2	2,450.7	8.4	8.3	-66.98	-507.9	-174.5	407.6	391.2	16.36	24.908	
2,600.0	2,582.0	2,570.6	2,543.6	8.8	8.8	-71.99	-504.7	-153.1	401.0	383.5	17.45	22.976	
2,700.0	2,680.7	2,666.6	2,636.3	9.3	9.4	-77.58	-500.0	-128.7	397.0	378.4	18.57	21.376	
2,756.4	2,736.4	2,718.3	2,686.2	9.5	9.7	-80.67	-497.1	-115.3	396.3	377.1	19.17	20.668	CC, ES
2,800.0	2,779.4	2,756.8	2,723.2	9.7	9.9	-82.98	-494.9	-105.2	396.8	377.1	19.62	20.227	
2,900.0	2,878.2	2,841.5	2,804.8	10.2	10.5	-88.02	-490.8	-82.8	401.7	381.1	20.56	19.535	
3,000.0	2,976.9	2,931.8	2,891.8	10.7	11.0	-93.15	-487.8	-58.9	411.8	390.4	21.44	19.213	
3,100.0	3,075.6	3,028.6	2,985.6	11.1	11.5	-98.19	-484.8	-35.0	425.1	402.9	22.20	19.144	SF
3,200.0	3,174.3	3,127.7	3,082.2	11.6	12.1	-102.79	-481.8	-12.9	440.0	417.1	22.89	19.220	
3,300.0	3,273.0	3,224.4	3,176.7	12.0	12.5	-106.88	-478.7	7.4	456.3	432.8	23.49	19.423	
3,400.0	3,371.7	3,321.5	3,271.6	12.5	13.0	-110.70	-475.1	27.1	474.2	450.1	24.04	19.720	
3,500.0	3,470.4	3,418.0	3,366.2	13.0	13.5	-114.20	-471.2	46.0	493.2	468.7	24.55	20.093	
3,600.0	3,569.1	3,514.2	3,460.7	13.4	13.9	-117.30	-468.2	63.7	513.5	488.5	25.03	20.520	
3,700.0	3,667.8	3,607.4	3,552.2	13.9	14.4	-120.11	-464.9	80.9	534.9	509.5	25.48	20.992	
3,800.0	3,766.5	3,694.8	3,637.8	14.3	14.8	-122.70	-460.9	98.2	558.3	532.4	25.93	21.530	
3,900.0	3,865.2	3,786.9	3,727.8	14.8	15.3	-125.31	-456.2	117.5	583.7	557.4	26.36	22.143	
4,000.0	3,963.9	3,882.2	3,820.9	15.3	15.8	-127.74	-451.9	137.0	610.1	583.3	26.79	22.776	
4,100.0	4,062.6	3,963.2	3,899.9	15.7	16.3	-129.72	-447.7	154.4	638.1	610.9	27.21	23.449	
4,200.0	4,161.4	4,062.5	3,996.6	16.2	16.8	-132.01	-442.2	176.5	667.6	639.9	27.63	24.159	
4,300.0	4,260.1	4,144.0	4,076.0	16.7	17.3	-133.70	-438.2	194.6	697.9	669.9	28.05	24.880	
4,400.0	4,358.8	4,229.0	4,158.4	17.1	17.8	-135.34	-434.3	214.9	730.7	702.2	28.49	25.650	
4,500.0	4,457.5	4,317.7	4,244.3	17.6	18.3	-136.93	-430.4	236.8	764.8	735.8	28.92	26.443	
4,584.5	4,540.9	4,394.8	4,318.9	18.0	18.8	-138.18	-427.2	255.6	793.8	764.5	29.29	27.100	
4,600.0	4,556.2	4,408.9	4,332.6	18.1	18.9	-138.47	-426.7	259.0	799.1	769.8	29.35	27.229	
4,700.0	4,655.2	4,513.2	4,433.8	18.4	19.5	-140.31	-422.7	284.3	832.3	802.6	29.70	28.027	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Raymond 38N-29HZX (Exist) - Wellbore #1 - Wellbore #1

Survey Program: 17-MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,754.7	4,636.1	4,554.0	18.6	20.1	-141.88	-418.6	309.5	859.5	829.4	30.10	28.551	
4,900.0	4,854.5	4,724.1	4,640.1	18.9	20.6	-142.87	-415.2	327.1	883.9	853.4	30.48	29.000	
5,000.0	4,954.4	4,822.2	4,736.0	19.1	21.1	-143.74	-411.4	347.4	906.3	875.5	30.88	29.355	
5,045.6	5,000.0	4,868.8	4,781.6	19.1	21.3	99.02	-409.8	356.9	915.6	884.3	31.26	29.293	
5,100.0	5,054.4	4,928.5	4,840.1	19.2	21.6	98.78	-407.8	368.9	926.1	894.5	31.52	29.384	
5,200.0	5,154.4	5,041.2	4,950.8	19.4	22.2	98.33	-403.7	389.5	943.6	911.6	31.99	29.495	
5,300.0	5,254.4	5,130.3	5,038.3	19.6	22.6	97.99	-400.4	405.9	961.4	929.0	32.42	29.656	
5,400.0	5,354.4	5,217.5	5,123.7	19.8	23.1	97.65	-397.0	423.0	980.3	947.4	32.84	29.846	
5,500.0	5,454.4	5,319.6	5,223.6	19.9	23.6	97.25	-392.9	443.6	999.8	966.5	33.31	30.014	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Soco 20-1K (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,800.0	7,281.8	7,277.6	7,274.8	85.8	17.8	93.43	4,249.5	-62.9	930.8	827.7	103.08	9.030	
10,856.4	7,280.9	7,276.2	7,273.3	87.1	17.8	93.28	4,249.5	-62.8	885.6	781.3	104.37	8.485	
10,900.0	7,280.2	7,275.1	7,272.2	88.0	17.8	93.24	4,249.5	-62.8	851.4	746.3	105.16	8.097	
11,000.0	7,278.7	7,272.4	7,269.5	90.0	17.8	93.11	4,249.5	-62.7	774.9	668.1	106.72	7.260	
11,065.3	7,277.7	7,270.6	7,267.7	91.3	17.8	93.00	4,249.5	-62.7	726.6	618.9	107.69	6.747	
11,100.0	7,277.2	7,269.6	7,266.8	92.0	17.8	92.90	4,249.6	-62.7	701.8	593.4	108.43	6.472	
11,200.0	7,275.6	7,266.9	7,264.1	94.2	17.8	92.58	4,249.6	-62.6	635.5	524.8	110.69	5.741	
11,300.0	7,274.1	7,264.2	7,261.4	96.5	17.8	92.28	4,249.6	-62.5	578.9	466.0	112.96	5.125	
11,400.0	7,272.5	7,261.6	7,258.8	98.7	17.8	91.98	4,249.6	-62.5	535.2	420.0	115.23	4.645	
11,500.0	7,271.0	7,259.0	7,256.2	101.0	17.7	91.68	4,249.7	-62.4	507.7	390.2	117.49	4.321	
11,593.7	7,269.6	7,256.7	7,253.8	103.1	17.7	91.41	4,249.7	-62.3	499.0	379.3	119.62	4.171	CC
11,600.0	7,269.5	7,256.5	7,253.7	103.2	17.7	91.39	4,249.7	-62.3	499.0	379.2	119.76	4.167	ES, SF
11,700.0	7,267.9	7,254.0	7,251.2	105.5	17.7	91.10	4,249.7	-62.3	510.2	388.1	122.03	4.181	
11,760.0	7,267.0	7,252.5	7,249.7	106.8	17.7	90.93	4,249.7	-62.2	525.9	402.5	123.39	4.262	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Soco 20-2K (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,800.0	7,281.8	7,233.5	7,230.4	85.8	20.6	-90.91	4,178.2	-1,260.0	962.0	856.2	105.81	9.091	
10,856.4	7,280.9	7,232.4	7,229.3	87.1	20.6	-90.81	4,178.2	-1,260.0	921.5	814.4	107.11	8.604	
10,900.0	7,280.2	7,231.5	7,228.4	88.0	20.6	-90.71	4,178.2	-1,260.0	891.6	783.7	107.90	8.264	
11,000.0	7,278.7	7,229.3	7,226.2	90.0	20.6	-90.48	4,178.2	-1,260.0	829.7	720.3	109.47	7.579	
11,065.3	7,277.7	7,227.9	7,224.8	91.3	20.6	-90.34	4,178.2	-1,260.0	795.1	684.7	110.45	7.199	
11,100.0	7,277.2	7,227.2	7,224.1	92.0	20.6	-90.28	4,178.2	-1,260.0	778.7	667.5	111.18	7.004	
11,200.0	7,275.6	7,224.9	7,221.8	94.2	20.6	-90.09	4,178.2	-1,260.0	738.5	625.0	113.45	6.509	
11,300.0	7,274.1	7,222.7	7,219.6	96.5	20.6	-89.91	4,178.3	-1,259.9	710.1	594.4	115.72	6.136	
11,400.0	7,272.5	7,220.4	7,217.3	98.7	20.6	-89.72	4,178.3	-1,259.9	695.1	577.1	117.99	5.891	
11,455.5	7,271.7	7,219.1	7,216.0	100.0	20.6	-89.61	4,178.3	-1,259.9	692.9	573.6	119.25	5.810	CC, ES
11,500.0	7,271.0	7,218.0	7,214.9	101.0	20.6	-89.52	4,178.3	-1,259.9	694.3	574.0	120.27	5.773	SF
11,600.0	7,269.5	7,215.7	7,212.6	103.2	20.5	-89.33	4,178.3	-1,259.9	707.8	585.2	122.54	5.776	
11,700.0	7,267.9	7,213.3	7,210.1	105.5	20.5	-89.13	4,178.3	-1,259.9	734.7	609.9	124.81	5.887	
11,760.0	7,267.0	7,211.8	7,208.7	106.8	20.5	-89.01	4,178.3	-1,259.9	756.8	630.6	126.18	5.998	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Soco 20-7K (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,600.0	7,300.2	7,258.5	7,256.4	58.9	17.2	-91.38	3,124.1	-926.4	910.4	835.0	75.35	12.082	
9,700.0	7,298.7	7,257.3	7,255.2	61.1	17.2	-91.17	3,124.1	-926.4	818.5	740.9	77.58	10.550	
9,800.0	7,297.1	7,256.0	7,253.9	63.3	17.2	-90.96	3,124.1	-926.4	728.6	648.8	79.82	9.128	
9,900.0	7,295.6	7,254.8	7,252.7	65.6	17.2	-90.75	3,124.1	-926.4	641.8	559.8	82.07	7.821	
10,000.0	7,294.1	7,253.5	7,251.4	67.8	17.2	-90.54	3,124.1	-926.4	559.5	475.1	84.32	6.635	
10,100.0	7,292.5	7,252.3	7,250.2	70.0	17.2	-90.33	3,124.1	-926.4	483.8	397.2	86.58	5.587	
10,200.0	7,291.0	7,251.0	7,248.9	72.3	17.2	-90.12	3,124.1	-926.4	418.4	329.5	88.85	4.709	
10,300.0	7,289.5	7,249.8	7,247.7	74.5	17.2	-89.91	3,124.1	-926.4	368.9	277.8	91.12	4.048	
10,400.0	7,287.9	7,248.5	7,246.4	76.8	17.2	-89.70	3,124.1	-926.4	342.2	248.8	93.39	3.664	
10,444.9	7,287.2	7,248.0	7,245.9	77.8	17.2	-89.60	3,124.0	-926.4	339.2	244.8	94.42	3.593	CC, ES
10,500.0	7,286.4	7,247.3	7,245.2	79.0	17.2	-89.49	3,124.0	-926.3	343.7	248.0	95.67	3.592	SF
10,600.0	7,284.8	7,246.0	7,243.9	81.3	17.2	-89.27	3,124.0	-926.3	373.0	275.1	97.95	3.808	
10,700.0	7,283.3	7,244.8	7,242.7	83.6	17.2	-89.06	3,124.0	-926.3	424.4	324.2	100.24	4.234	
10,800.0	7,281.8	7,243.5	7,241.4	85.8	17.2	-88.85	3,124.0	-926.3	491.1	388.6	102.52	4.790	
10,856.4	7,280.9	7,242.8	7,240.7	87.1	17.2	-88.73	3,124.0	-926.3	533.3	429.5	103.81	5.137	
10,900.0	7,280.2	7,242.3	7,240.2	88.0	17.2	-88.60	3,124.0	-926.3	567.8	463.2	104.59	5.429	
11,000.0	7,278.7	7,241.0	7,238.9	90.0	17.2	-88.25	3,124.0	-926.3	652.3	546.2	106.16	6.145	
11,065.3	7,277.7	7,240.1	7,238.1	91.3	17.2	-87.99	3,124.0	-926.3	710.6	603.5	107.12	6.633	
11,100.0	7,277.2	7,239.7	7,237.6	92.0	17.2	-87.90	3,124.0	-926.3	742.2	634.3	107.85	6.881	
11,200.0	7,275.6	7,238.4	7,236.3	94.2	17.2	-87.65	3,124.0	-926.3	834.6	724.4	110.11	7.579	
11,300.0	7,274.1	7,237.1	7,235.0	96.5	17.2	-87.41	3,124.0	-926.3	928.5	816.2	112.36	8.264	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.20-T3N-R66W - Soco 20-8K (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,700.0	7,298.7	7,272.4	7,271.2	61.1	18.5	92.04	3,178.1	-94.6	927.0	848.0	78.99	11.736	
9,800.0	7,297.1	7,272.4	7,271.2	63.3	18.5	92.04	3,178.1	-94.6	844.0	762.8	81.21	10.393	
9,900.0	7,295.6	7,272.3	7,271.1	65.6	18.5	92.03	3,178.1	-94.6	765.2	681.7	83.45	9.170	
10,000.0	7,294.1	7,272.3	7,271.1	67.8	18.5	92.03	3,178.1	-94.6	691.8	606.1	85.69	8.073	
10,100.0	7,292.5	7,272.3	7,271.1	70.0	18.5	92.02	3,178.1	-94.6	625.8	537.9	87.94	7.116	
10,200.0	7,291.0	7,272.2	7,271.0	72.3	18.5	92.02	3,178.1	-94.6	569.8	479.6	90.20	6.318	
10,300.0	7,289.5	7,272.2	7,271.0	74.5	18.5	92.02	3,178.1	-94.6	527.1	434.6	92.46	5.700	
10,400.0	7,287.9	7,272.2	7,271.0	76.8	18.5	92.01	3,178.1	-94.6	500.9	406.1	94.73	5.287	
10,484.6	7,286.6	7,272.1	7,270.9	78.7	18.5	92.01	3,178.1	-94.6	493.7	397.0	96.65	5.108 CC	
10,500.0	7,286.4	7,272.1	7,270.9	79.0	18.5	92.01	3,178.1	-94.6	493.9	396.9	97.00	5.092 ES, SF	
10,600.0	7,284.8	7,272.1	7,270.9	81.3	18.5	92.01	3,178.1	-94.6	507.0	407.7	99.28	5.107	
10,700.0	7,283.3	7,272.1	7,270.9	83.6	18.5	92.00	3,178.1	-94.6	538.6	437.0	101.56	5.303	
10,800.0	7,281.8	7,272.0	7,270.8	85.8	18.5	92.00	3,178.1	-94.6	585.8	482.0	103.84	5.641	
10,856.4	7,280.9	7,272.0	7,270.8	87.1	18.5	92.00	3,178.1	-94.6	618.0	512.9	105.13	5.878	
10,900.0	7,280.2	7,272.0	7,270.8	88.0	18.5	91.98	3,178.1	-94.6	644.9	539.0	105.92	6.089	
11,000.0	7,278.7	7,271.8	7,270.6	90.0	18.5	91.93	3,178.1	-94.5	711.1	603.6	107.49	6.616	
11,065.3	7,277.7	7,271.7	7,270.5	91.3	18.5	91.89	3,178.1	-94.5	757.1	648.7	108.45	6.981	
11,100.0	7,277.2	7,271.6	7,270.4	92.0	18.5	91.88	3,178.1	-94.5	782.4	673.2	109.19	7.165	
11,200.0	7,275.6	7,271.3	7,270.1	94.2	18.5	91.85	3,178.1	-94.5	858.9	747.5	111.45	7.707	
11,300.0	7,274.1	7,271.0	7,269.8	96.5	18.5	91.81	3,178.1	-94.5	939.9	826.2	113.72	8.265	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.22	-45.0	0.6	45.0				
100.0	100.0	99.0	99.0	0.1	0.1	179.22	-45.0	0.6	45.0	44.7	0.27	164.452	
200.0	200.0	199.0	199.0	0.4	0.4	179.22	-45.0	0.6	45.0	44.1	0.82	54.726	CC
300.0	300.0	298.8	298.8	0.7	0.7	-179.17	-45.1	-0.7	45.1	43.8	1.36	33.294	ES
400.0	400.0	398.5	398.4	1.0	0.9	-174.38	-45.7	-4.5	45.9	44.0	1.89	24.233	
500.0	500.0	497.9	497.6	1.2	1.2	-166.85	-46.6	-10.9	47.9	45.4	2.45	19.525	
600.0	600.0	597.0	596.3	1.5	1.5	-157.54	-47.9	-19.8	51.9	48.8	3.04	17.090	
700.0	700.0	695.5	694.1	1.8	1.9	-147.81	-49.5	-31.2	58.7	55.0	3.66	16.052	
800.0	800.0	793.3	790.9	2.1	2.3	-138.89	-51.5	-44.9	68.8	64.5	4.32	15.920	
900.0	900.0	890.5	886.8	2.3	2.7	-14.65	-53.8	-61.0	81.0	76.2	4.75	17.046	
1,000.0	999.9	987.4	981.8	2.5	3.2	-8.86	-56.4	-79.4	93.8	88.5	5.29	17.750	
1,100.0	1,099.7	1,083.8	1,076.0	2.8	3.7	-4.10	-59.3	-100.2	107.1	101.3	5.83	18.377	
1,200.0	1,199.3	1,179.9	1,169.2	3.1	4.3	-0.05	-62.6	-123.1	120.8	114.4	6.38	18.931	
1,300.0	1,298.6	1,275.5	1,261.4	3.4	4.9	3.47	-66.2	-148.3	134.7	127.8	6.94	19.415	
1,400.0	1,397.5	1,371.3	1,353.0	3.7	5.6	6.62	-70.1	-175.8	148.9	141.4	7.51	19.830	
1,414.8	1,412.1	1,385.9	1,367.0	3.8	5.7	7.07	-70.7	-180.1	151.0	143.4	7.60	19.872	
1,500.0	1,496.2	1,470.1	1,447.3	4.1	6.3	9.46	-74.3	-204.9	162.8	154.7	8.11	20.074	
1,600.0	1,595.0	1,568.8	1,541.6	4.5	7.0	11.85	-78.4	-234.0	176.9	168.2	8.72	20.282	
1,700.0	1,693.7	1,667.5	1,635.8	4.9	7.8	13.89	-82.6	-263.1	191.3	181.9	9.35	20.454	
1,800.0	1,792.4	1,766.3	1,730.1	5.3	8.5	15.64	-86.7	-292.2	205.9	195.9	10.00	20.592	
1,900.0	1,891.1	1,865.0	1,824.4	5.7	9.3	17.16	-90.9	-321.3	220.6	210.0	10.66	20.698	
2,000.0	1,989.8	1,963.8	1,918.6	6.2	10.0	18.49	-95.1	-350.5	235.5	224.2	11.34	20.778	
2,100.0	2,088.5	2,062.5	2,012.9	6.6	10.8	19.66	-99.2	-379.6	250.5	238.5	12.02	20.835	
2,200.0	2,187.2	2,161.3	2,107.2	7.0	11.6	20.69	-103.4	-408.7	265.6	252.9	12.73	20.875	
2,300.0	2,285.9	2,260.0	2,201.4	7.5	12.3	21.62	-107.5	-437.8	280.8	267.4	13.44	20.900	
2,400.0	2,384.6	2,358.8	2,295.7	7.9	13.1	22.45	-111.7	-466.9	296.0	281.9	14.16	20.913	
2,500.0	2,483.3	2,457.5	2,390.0	8.4	13.8	23.20	-115.8	-496.0	311.3	296.4	14.88	20.917	
2,600.0	2,582.0	2,556.3	2,484.2	8.8	14.6	23.88	-120.0	-525.2	326.7	311.0	15.62	20.914	
2,700.0	2,680.7	2,655.0	2,578.5	9.3	15.4	24.50	-124.1	-554.3	342.0	325.7	16.36	20.906	
2,800.0	2,779.4	2,753.8	2,672.7	9.7	16.1	25.07	-128.3	-583.4	357.4	340.3	17.11	20.893	
2,900.0	2,878.2	2,852.5	2,767.0	10.2	16.9	25.59	-132.5	-612.5	372.9	355.0	17.86	20.877	
3,000.0	2,976.9	2,951.2	2,861.3	10.7	17.7	26.06	-136.6	-641.6	388.4	369.7	18.62	20.859	
3,100.0	3,075.6	3,050.0	2,955.5	11.1	18.4	26.50	-140.8	-670.7	403.8	384.5	19.38	20.839	
3,200.0	3,174.3	3,148.7	3,049.8	11.6	19.2	26.91	-144.9	-699.9	419.4	399.2	20.14	20.817	
3,300.0	3,273.0	3,247.5	3,144.1	12.0	20.0	27.29	-149.1	-729.0	434.9	414.0	20.91	20.795	
3,400.0	3,371.7	3,346.2	3,238.3	12.5	20.8	27.64	-153.2	-758.1	450.5	428.8	21.69	20.772	
3,500.0	3,470.4	3,445.0	3,332.6	13.0	21.5	27.97	-157.4	-787.2	466.0	443.6	22.46	20.749	
3,600.0	3,569.1	3,543.7	3,426.9	13.4	22.3	28.28	-161.5	-816.3	481.6	458.4	23.24	20.726	
3,700.0	3,667.8	3,642.5	3,521.1	13.9	23.1	28.57	-165.7	-845.4	497.2	473.2	24.02	20.703	
3,800.0	3,766.5	3,741.2	3,615.4	14.3	23.8	28.84	-169.9	-874.5	512.8	488.0	24.80	20.679	
3,900.0	3,865.2	3,840.0	3,709.7	14.8	24.6	29.10	-174.0	-903.7	528.4	502.8	25.58	20.657	
4,000.0	3,963.9	3,938.7	3,803.9	15.3	25.4	29.34	-178.2	-932.8	544.0	517.7	26.37	20.634	
4,100.0	4,062.6	4,037.5	3,898.2	15.7	26.1	29.57	-182.3	-961.9	559.7	532.5	27.15	20.612	
4,200.0	4,161.4	4,136.2	3,992.5	16.2	26.9	29.78	-186.5	-991.0	575.3	547.4	27.94	20.590	
4,300.0	4,260.1	4,234.9	4,086.7	16.7	27.7	29.98	-190.6	-1,020.1	591.0	562.2	28.73	20.569	
4,400.0	4,358.8	4,333.7	4,181.0	17.1	28.5	30.18	-194.8	-1,049.2	606.6	577.1	29.52	20.548	
4,500.0	4,457.5	4,432.4	4,275.2	17.6	29.2	30.36	-198.9	-1,078.4	622.3	592.0	30.31	20.528	
4,584.5	4,540.9	4,515.9	4,354.9	18.0	29.9	30.51	-202.5	-1,103.0	635.5	604.6	30.99	20.511	
4,600.0	4,556.2	4,531.2	4,369.5	18.1	30.0	30.56	-203.1	-1,107.5	638.0	606.9	31.10	20.516	
4,700.0	4,655.2	4,629.6	4,463.5	18.4	30.8	30.80	-207.2	-1,136.5	655.6	623.9	31.74	20.657	
4,800.0	4,754.7	4,727.5	4,556.9	18.6	31.5	30.92	-211.4	-1,165.4	676.2	643.9	32.31	20.930	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,824.6	4,649.6	18.9	32.3	30.93	-215.4	-1,194.0	699.7	666.9	32.80	21.332	
5,000.0	4,954.4	4,921.0	4,741.6	19.1	33.0	30.84	-219.5	-1,222.4	726.1	692.9	33.22	21.858	
5,045.6	5,000.0	4,964.6	4,783.3	19.1	33.4	-86.13	-221.3	-1,235.3	739.1	705.4	33.65	21.963	
5,100.0	5,054.4	5,016.5	4,832.8	19.2	33.8	-86.39	-223.5	-1,250.6	755.0	721.1	33.90	22.272	
5,200.0	5,154.4	5,112.0	4,924.0	19.4	34.5	-86.83	-227.5	-1,278.7	784.2	749.8	34.35	22.827	
5,300.0	5,254.4	5,207.5	5,015.1	19.6	35.3	-87.24	-231.6	-1,306.9	813.5	778.7	34.82	23.363	
5,400.0	5,354.4	5,302.9	5,106.2	19.8	36.0	-87.62	-235.6	-1,335.0	842.8	807.5	35.29	23.879	
5,500.0	5,454.4	5,398.4	5,197.3	19.9	36.8	-87.98	-239.6	-1,363.2	872.1	836.4	35.78	24.376	
5,600.0	5,554.4	5,493.8	5,288.5	20.1	37.5	-88.31	-243.6	-1,391.3	901.5	865.2	36.27	24.856	
5,700.0	5,654.4	5,589.3	5,379.6	20.3	38.3	-88.62	-247.6	-1,419.5	930.9	894.1	36.77	25.319	
5,800.0	5,754.4	5,697.2	5,482.7	20.5	39.1	-88.95	-252.1	-1,451.1	960.2	922.9	37.30	25.744	
5,900.0	5,854.4	5,842.6	5,623.0	20.7	39.8	-89.31	-257.5	-1,488.6	986.0	948.1	37.85	26.048	
9,600.0	7,300.2	9,680.9	7,209.7	58.9	67.4	-84.87	2,284.4	-1,568.2	999.3	880.3	118.98	8.399	
9,700.0	7,298.7	9,780.9	7,208.6	61.1	69.3	-84.89	2,384.4	-1,568.2	997.6	874.2	123.35	8.087	
9,800.0	7,297.1	9,880.9	7,207.5	63.3	71.3	-84.91	2,484.4	-1,568.2	995.8	868.1	127.74	7.795	
9,900.0	7,295.6	9,980.9	7,206.4	65.6	73.2	-84.92	2,584.3	-1,568.1	994.1	861.9	132.15	7.522	
10,000.0	7,294.1	10,080.9	7,205.3	67.8	75.2	-84.94	2,684.3	-1,568.1	992.3	855.7	136.58	7.265	
10,100.0	7,292.5	10,180.8	7,204.2	70.0	77.2	-84.95	2,784.3	-1,568.1	990.6	849.5	141.03	7.024	
10,200.0	7,291.0	10,280.8	7,203.1	72.3	79.3	-84.97	2,884.3	-1,568.1	988.8	843.3	145.49	6.797	
10,300.0	7,289.5	10,380.8	7,202.0	74.5	81.3	-84.99	2,984.3	-1,568.0	987.1	837.1	149.96	6.582	
10,400.0	7,287.9	10,480.8	7,200.9	76.8	83.4	-85.00	3,084.2	-1,568.0	985.3	830.9	154.45	6.380	
10,500.0	7,286.4	10,580.8	7,199.8	79.0	85.5	-85.02	3,184.2	-1,568.0	983.6	824.7	158.95	6.188	
10,600.0	7,284.8	10,680.8	7,198.7	81.3	87.6	-85.04	3,284.2	-1,567.9	981.9	818.4	163.46	6.007	
10,700.0	7,283.3	10,780.7	7,197.6	83.6	89.7	-85.05	3,384.2	-1,567.9	980.1	812.1	167.97	5.835	
10,800.0	7,281.8	10,880.7	7,196.5	85.8	91.8	-85.07	3,484.1	-1,567.9	978.4	805.9	172.50	5.672	
10,856.4	7,280.9	10,937.1	7,195.8	87.1	93.0	-85.08	3,540.5	-1,567.9	977.4	802.3	175.06	5.583	
10,900.0	7,280.2	10,980.7	7,195.4	88.0	93.9	-85.08	3,584.1	-1,567.9	977.0	800.6	176.40	5.538	
10,906.5	7,280.1	10,987.2	7,195.3	88.2	94.1	-85.08	3,590.6	-1,567.9	977.0	800.4	176.59	5.533	
11,000.0	7,278.7	11,080.7	7,194.3	90.0	96.1	-85.08	3,684.1	-1,567.8	978.5	799.3	179.18	5.461	
11,065.3	7,277.7	11,146.0	7,193.6	91.3	97.5	-85.08	3,749.4	-1,567.8	981.3	800.5	180.88	5.425	
11,100.0	7,277.2	11,180.6	7,193.2	92.0	98.2	-85.10	3,784.0	-1,567.8	983.3	800.9	182.40	5.391	
11,200.0	7,275.6	11,280.4	7,192.1	94.2	100.4	-85.15	3,883.8	-1,567.8	988.8	801.9	186.91	5.290	
11,300.0	7,274.1	11,380.3	7,191.0	96.5	102.5	-85.21	3,983.7	-1,567.8	994.3	802.9	191.43	5.194	
11,400.0	7,272.5	11,480.1	7,189.9	98.7	104.7	-85.26	4,083.5	-1,567.7	999.8	803.9	195.95	5.102	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	179.27	-30.0	0.4	30.0				
100.0	100.0	99.0	99.0	0.1	0.1	179.27	-30.0	0.4	30.0	29.7	0.27	109.701	
200.0	200.0	199.0	199.0	0.4	0.4	179.27	-30.0	0.4	30.0	29.2	0.82	36.506	
300.0	300.0	299.0	299.0	0.7	0.7	179.27	-30.0	0.4	30.0	28.6	1.37	21.874	
400.0	400.0	399.0	399.0	1.0	1.0	179.27	-30.0	0.4	30.0	28.1	1.92	15.616	CC
500.0	500.0	498.8	498.8	1.2	1.2	-178.35	-30.2	-0.9	30.2	27.8	2.45	12.339	ES
600.0	600.0	598.5	598.5	1.5	1.5	-171.42	-31.0	-4.7	31.3	28.4	2.98	10.524	
700.0	700.0	698.0	697.7	1.8	1.7	-161.13	-32.2	-11.0	34.1	30.6	3.52	9.676	
800.0	800.0	797.0	796.3	2.1	2.0	-149.71	-34.0	-19.8	39.4	35.3	4.09	9.631	
900.0	900.0	895.6	894.3	2.3	2.4	-22.95	-36.2	-31.1	46.8	42.1	4.61	10.137	
1,000.0	999.9	994.0	991.6	2.5	2.7	-15.27	-38.9	-44.8	54.8	49.6	5.13	10.673	
1,100.0	1,099.7	1,092.1	1,088.3	2.8	3.1	-9.04	-42.0	-61.0	63.3	57.6	5.66	11.178	
1,200.0	1,199.3	1,189.9	1,184.3	3.1	3.6	-3.81	-45.7	-79.5	72.1	66.0	6.20	11.645	
1,300.0	1,298.6	1,287.4	1,279.5	3.4	4.1	0.71	-49.8	-100.3	81.4	74.6	6.74	12.073	
1,400.0	1,397.5	1,384.8	1,373.9	3.7	4.7	4.72	-54.3	-123.5	90.9	83.6	7.29	12.459	
1,414.8	1,412.1	1,399.5	1,388.2	3.8	4.7	5.28	-55.1	-127.1	92.2	84.8	7.38	12.503	
1,500.0	1,496.2	1,484.2	1,470.1	4.1	5.3	8.24	-59.2	-148.2	100.1	92.3	7.87	12.723	
1,600.0	1,595.0	1,583.6	1,566.3	4.5	5.9	11.15	-64.0	-172.8	109.7	101.2	8.47	12.957	
1,700.0	1,693.7	1,683.0	1,662.4	4.9	6.5	13.60	-68.9	-197.5	119.5	110.4	9.08	13.157	
1,800.0	1,792.4	1,782.4	1,758.6	5.3	7.2	15.67	-73.7	-222.2	129.5	119.8	9.72	13.326	
1,900.0	1,891.1	1,881.8	1,854.8	5.7	7.8	17.44	-78.6	-246.8	139.7	129.3	10.37	13.465	
2,000.0	1,989.8	1,981.2	1,950.9	6.2	8.4	18.98	-83.4	-271.5	149.9	138.9	11.04	13.580	
2,100.0	2,088.5	2,080.6	2,047.1	6.6	9.1	20.31	-88.3	-296.2	160.3	148.5	11.72	13.673	
2,200.0	2,187.2	2,180.0	2,143.3	7.0	9.7	21.49	-93.1	-320.8	170.7	158.3	12.41	13.748	
2,300.0	2,285.9	2,279.4	2,239.4	7.5	10.4	22.52	-98.0	-345.5	181.2	168.0	13.12	13.808	
2,400.0	2,384.6	2,378.8	2,335.6	7.9	11.0	23.45	-102.8	-370.2	191.7	177.9	13.83	13.857	
2,500.0	2,483.3	2,478.2	2,431.8	8.4	11.7	24.28	-107.7	-394.9	202.3	187.7	14.56	13.896	
2,600.0	2,582.0	2,577.6	2,527.9	8.8	12.4	25.02	-112.5	-419.5	212.9	197.6	15.29	13.927	
2,700.0	2,680.7	2,677.0	2,624.1	9.3	13.0	25.70	-117.4	-444.2	223.5	207.5	16.02	13.951	
2,800.0	2,779.4	2,776.4	2,720.3	9.7	13.7	26.31	-122.2	-468.9	234.2	217.5	16.77	13.970	
2,900.0	2,878.2	2,875.8	2,816.4	10.2	14.3	26.87	-127.1	-493.5	244.9	227.4	17.51	13.985	
3,000.0	2,976.9	2,975.2	2,912.6	10.7	15.0	27.38	-131.9	-518.2	255.7	237.4	18.27	13.996	
3,100.0	3,075.6	3,074.6	3,008.8	11.1	15.7	27.86	-136.8	-542.9	266.4	247.4	19.02	14.004	
3,200.0	3,174.3	3,174.0	3,104.9	11.6	16.3	28.29	-141.6	-567.5	277.2	257.4	19.78	14.010	
3,300.0	3,273.0	3,273.4	3,201.1	12.0	17.0	28.69	-146.5	-592.2	287.9	267.4	20.55	14.014	
3,400.0	3,371.7	3,372.8	3,297.3	12.5	17.7	29.07	-151.3	-616.9	298.7	277.4	21.31	14.017	
3,500.0	3,470.4	3,472.2	3,393.4	13.0	18.3	29.41	-156.1	-641.5	309.5	287.4	22.08	14.018	
3,600.0	3,569.1	3,571.6	3,489.6	13.4	19.0	29.74	-161.0	-666.2	320.3	297.5	22.85	14.018	
3,700.0	3,667.8	3,671.0	3,585.8	13.9	19.6	30.04	-165.8	-690.9	331.1	307.5	23.62	14.017	
3,800.0	3,766.5	3,770.4	3,681.9	14.3	20.3	30.32	-170.7	-715.5	342.0	317.6	24.40	14.015	
3,900.0	3,865.2	3,869.8	3,778.1	14.8	21.0	30.59	-175.5	-740.2	352.8	327.6	25.18	14.013	
4,000.0	3,963.9	3,969.2	3,874.3	15.3	21.6	30.84	-180.4	-764.9	363.6	337.7	25.96	14.010	
4,100.0	4,062.6	4,068.6	3,970.4	15.7	22.3	31.08	-185.2	-789.6	374.5	347.8	26.74	14.007	
4,200.0	4,161.4	4,168.0	4,066.6	16.2	23.0	31.30	-190.1	-814.2	385.3	357.8	27.52	14.004	
4,300.0	4,260.1	4,267.4	4,162.8	16.7	23.6	31.51	-194.9	-838.9	396.2	367.9	28.30	14.000	
4,400.0	4,358.8	4,366.8	4,258.9	17.1	24.3	31.71	-199.8	-863.6	407.1	378.0	29.08	13.996	
4,500.0	4,457.5	4,466.2	4,355.1	17.6	25.0	31.90	-204.6	-888.2	417.9	388.1	29.87	13.992	
4,584.5	4,540.9	4,550.2	4,436.4	18.0	25.5	32.05	-208.7	-909.1	427.1	396.6	30.53	13.989	
4,600.0	4,556.2	4,565.6	4,451.3	18.1	25.6	32.09	-209.5	-912.9	428.8	398.2	30.65	13.993	
4,700.0	4,655.2	4,664.7	4,547.2	18.4	26.3	32.24	-214.3	-937.5	441.6	410.4	31.28	14.118	
4,800.0	4,754.7	4,763.5	4,642.7	18.6	27.0	32.19	-219.1	-962.0	457.4	425.5	31.83	14.371	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,861.6	4,737.7	18.9	27.6	31.95	-223.9	-986.4	476.0	443.7	32.28	14.746	
5,000.0	4,954.4	4,959.2	4,832.1	19.1	28.3	31.57	-228.7	-1,010.6	497.6	465.0	32.65	15.240	
5,045.6	5,000.0	5,003.4	4,874.8	19.1	28.6	-85.56	-230.8	-1,021.6	508.4	475.4	33.04	15.389	
5,100.0	5,054.4	5,056.0	4,925.7	19.2	28.9	-85.96	-233.4	-1,034.6	521.7	488.5	33.25	15.692	
5,200.0	5,154.4	5,152.7	5,019.3	19.4	29.6	-86.66	-238.1	-1,058.6	546.2	512.6	33.64	16.236	
5,300.0	5,254.4	5,249.5	5,112.9	19.6	30.2	-87.29	-242.8	-1,082.6	570.8	536.8	34.05	16.762	
5,400.0	5,354.4	5,346.2	5,206.6	19.8	30.9	-87.87	-247.6	-1,106.7	595.4	561.0	34.48	17.270	
5,500.0	5,454.4	5,449.8	5,306.8	19.9	31.5	-88.44	-252.6	-1,132.2	620.0	585.1	34.92	17.754	
5,600.0	5,554.4	5,574.1	5,428.1	20.1	32.1	-88.99	-257.9	-1,159.1	641.6	606.2	35.37	18.141	
5,700.0	5,654.4	5,700.7	5,552.6	20.3	32.6	-89.40	-262.2	-1,181.2	659.0	623.2	35.81	18.402	
5,800.0	5,754.4	5,829.0	5,679.7	20.5	33.0	-89.70	-265.5	-1,198.1	672.2	635.9	36.26	18.536	
5,900.0	5,854.4	5,958.6	5,808.8	20.7	33.3	-89.90	-267.8	-1,209.4	680.9	644.2	36.71	18.547	
6,000.0	5,954.4	6,089.0	5,939.1	20.9	33.5	-89.99	-268.9	-1,215.1	685.2	648.1	37.16	18.438	
6,100.0	6,054.4	6,203.3	6,053.4	21.0	33.7	-90.00	-269.0	-1,215.7	685.7	648.1	37.60	18.238	
6,200.0	6,154.4	6,303.3	6,153.4	21.2	33.8	-90.00	-269.0	-1,215.7	685.7	647.7	38.01	18.039	
6,300.0	6,254.4	6,403.3	6,253.4	21.4	33.9	-90.00	-269.0	-1,215.7	685.7	647.3	38.43	17.844	
6,400.0	6,354.4	6,503.3	6,353.4	21.6	34.0	-90.00	-269.0	-1,215.7	685.7	646.9	38.85	17.651	
6,500.0	6,454.4	6,603.3	6,453.4	21.8	34.2	-90.00	-269.0	-1,215.7	685.7	646.4	39.27	17.461	
6,609.3	6,563.6	6,712.6	6,562.6	22.0	34.3	-90.00	-269.0	-1,215.7	685.7	646.0	39.74	17.256	
6,650.0	6,604.4	6,753.4	6,603.4	22.1	34.3	-89.04	-267.9	-1,215.7	685.7	646.0	39.71	17.268	
6,700.0	6,654.2	6,803.4	6,653.2	22.2	34.4	-89.05	-263.7	-1,215.7	685.6	645.7	39.88	17.193	
6,750.0	6,703.6	6,853.4	6,702.6	22.3	34.4	-89.06	-256.1	-1,215.7	685.5	645.5	40.01	17.132	
6,800.0	6,752.4	6,903.4	6,751.5	22.3	34.5	-89.08	-245.4	-1,215.7	685.3	645.2	40.11	17.085	
6,850.0	6,800.4	6,953.4	6,799.5	22.4	34.5	-89.10	-231.5	-1,215.7	685.1	644.9	40.18	17.049	
6,900.0	6,847.4	7,003.4	6,846.5	22.4	34.5	-89.12	-214.5	-1,215.7	684.8	644.6	40.23	17.020	
6,950.0	6,893.2	7,053.4	6,892.3	22.4	34.5	-89.15	-194.4	-1,215.7	684.5	644.2	40.27	16.996	
7,000.0	6,937.6	7,103.5	6,936.7	22.4	34.5	-89.18	-171.4	-1,215.7	684.1	643.8	40.31	16.972	
7,050.0	6,980.3	7,153.5	6,979.5	22.4	34.5	-89.22	-145.5	-1,215.7	683.6	643.3	40.35	16.943	
7,100.0	7,021.3	7,203.5	7,020.6	22.4	34.5	-89.25	-116.9	-1,215.7	683.1	642.7	40.41	16.905	
7,150.0	7,060.4	7,253.5	7,059.6	22.4	34.5	-89.30	-85.7	-1,215.7	682.6	642.1	40.50	16.853	
7,200.0	7,097.3	7,303.5	7,096.5	22.4	34.5	-89.34	-52.0	-1,215.7	682.0	641.4	40.64	16.781	
7,250.0	7,131.9	7,353.6	7,131.2	22.4	34.6	-89.39	-15.9	-1,215.7	681.4	640.6	40.84	16.686	
7,300.0	7,164.0	7,403.6	7,163.4	22.4	34.6	-89.44	22.4	-1,215.7	680.8	639.7	41.10	16.563	
7,350.0	7,193.7	7,453.6	7,193.0	22.4	34.6	-89.49	62.7	-1,215.7	680.1	638.7	41.44	16.410	
7,400.0	7,220.6	7,503.6	7,220.0	22.5	34.6	-89.54	104.8	-1,215.7	679.4	637.5	41.88	16.224	
7,450.0	7,244.7	7,553.7	7,244.1	22.6	34.7	-89.60	148.6	-1,215.6	678.6	636.2	42.40	16.005	
7,500.0	7,265.8	7,603.7	7,265.3	22.7	34.8	-89.66	193.9	-1,215.6	677.9	634.8	43.03	15.754	
7,550.0	7,284.0	7,653.7	7,283.5	22.9	34.9	-89.72	240.5	-1,215.6	677.1	633.3	43.76	15.473	
7,600.0	7,299.1	7,703.7	7,298.6	23.1	35.0	-89.78	288.2	-1,215.6	676.3	631.7	44.59	15.166	
7,650.0	7,311.1	7,753.8	7,310.5	23.4	35.2	-89.84	336.8	-1,215.6	675.5	629.9	45.52	14.838	
7,700.0	7,319.8	7,803.8	7,319.3	23.9	35.4	-89.90	386.0	-1,215.6	674.6	628.1	46.55	14.493	
7,750.0	7,325.3	7,853.8	7,324.8	24.3	35.6	-89.97	435.7	-1,215.6	673.8	626.1	47.66	14.136	
7,800.0	7,327.5	7,903.8	7,327.0	24.9	35.9	-90.03	485.7	-1,215.6	672.9	624.1	48.86	13.774	
7,821.0	7,327.5	7,924.8	7,327.0	25.1	36.0	-90.06	506.7	-1,215.6	672.6	623.2	49.38	13.621	
7,821.2	7,327.5	7,925.1	7,327.0	25.1	36.0	-90.06	506.9	-1,215.6	672.6	623.2	49.39	13.619	
7,822.2	7,327.5	7,926.0	7,327.0	25.2	36.0	-90.06	507.9	-1,215.6	672.6	623.2	49.41	13.612	
7,900.0	7,326.3	8,003.8	7,325.9	26.1	36.5	-90.06	585.7	-1,215.6	671.2	619.9	51.35	13.071	
8,000.0	7,324.8	8,103.8	7,324.4	27.5	37.3	-90.07	685.7	-1,215.6	669.5	615.3	54.26	12.340	
8,100.0	7,323.2	8,203.8	7,323.0	29.0	38.3	-90.08	785.6	-1,215.5	667.8	610.4	57.40	11.634	
8,200.0	7,321.7	8,303.8	7,321.5	30.7	39.4	-90.09	885.6	-1,215.5	666.1	605.4	60.75	10.965	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Q-321 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	7,320.2	8,403.8	7,320.1	32.4	40.6	-90.09	985.6	-1,215.5	664.4	600.2	64.26	10.339	
8,400.0	7,318.6	8,503.8	7,318.6	34.2	42.0	-90.10	1,085.6	-1,215.5	662.7	594.8	67.92	9.758	
8,500.0	7,317.1	8,603.8	7,317.2	36.1	43.5	-90.11	1,185.5	-1,215.5	661.0	589.3	71.70	9.220	
8,600.0	7,315.5	8,703.7	7,315.7	38.0	45.0	-90.12	1,285.5	-1,215.5	659.3	583.8	75.58	8.724	
8,700.0	7,314.0	8,803.7	7,314.3	40.0	46.6	-90.13	1,385.5	-1,215.4	657.6	578.1	79.54	8.268	
8,800.0	7,312.5	8,903.7	7,312.8	42.0	48.3	-90.13	1,485.5	-1,215.4	655.9	572.4	83.59	7.847	
8,900.0	7,310.9	9,003.7	7,311.4	44.0	50.1	-90.14	1,585.4	-1,215.4	654.2	566.5	87.69	7.460	
9,000.0	7,309.4	9,103.7	7,309.9	46.1	51.9	-90.15	1,685.4	-1,215.4	652.5	560.7	91.86	7.104	
9,100.0	7,307.9	9,203.7	7,308.5	48.2	53.7	-90.16	1,785.4	-1,215.4	650.8	554.8	96.07	6.775	
9,200.0	7,306.3	9,303.7	7,307.0	50.3	55.6	-90.17	1,885.4	-1,215.4	649.1	548.8	100.32	6.470	
9,300.0	7,304.8	9,403.6	7,305.6	52.4	57.5	-90.17	1,985.3	-1,215.3	647.4	542.8	104.62	6.189	
9,400.0	7,303.3	9,503.6	7,304.1	54.6	59.5	-90.18	2,085.3	-1,215.3	645.7	536.8	108.94	5.927	
9,500.0	7,301.7	9,603.6	7,302.7	56.8	61.5	-90.19	2,185.3	-1,215.3	644.0	530.7	113.30	5.684	
9,600.0	7,300.2	9,703.6	7,301.2	58.9	63.5	-90.20	2,285.3	-1,215.3	642.3	524.7	117.68	5.458	
9,700.0	7,298.7	9,803.6	7,299.8	61.1	65.5	-90.21	2,385.2	-1,215.3	640.6	518.6	122.08	5.248	
9,800.0	7,297.1	9,903.6	7,298.3	63.3	67.6	-90.21	2,485.2	-1,215.2	638.9	512.4	126.51	5.051	
9,900.0	7,295.6	10,003.6	7,296.9	65.6	69.7	-90.22	2,585.2	-1,215.2	637.2	506.3	130.95	4.866	
10,000.0	7,294.1	10,104.5	7,295.4	67.8	71.8	-90.23	2,686.1	-1,215.2	635.5	500.1	135.42	4.693	
10,100.0	7,292.5	10,232.8	7,293.6	70.0	74.3	-90.24	2,814.3	-1,212.1	631.5	491.2	140.29	4.501	
10,200.0	7,291.0	10,340.7	7,292.0	72.3	76.4	-90.25	2,922.0	-1,206.0	624.0	479.2	144.79	4.310	
10,300.0	7,289.5	10,440.4	7,290.6	74.5	78.4	-90.26	3,021.6	-1,200.1	616.4	467.2	149.26	4.130	
10,400.0	7,287.9	10,540.1	7,289.1	76.8	80.5	-90.28	3,121.1	-1,194.1	608.8	455.1	153.74	3.960	
10,500.0	7,286.4	10,639.8	7,287.7	79.0	82.6	-90.29	3,220.6	-1,188.2	601.2	443.0	158.23	3.800	
10,600.0	7,284.8	10,739.5	7,286.2	81.3	84.7	-90.30	3,320.1	-1,182.3	593.6	430.8	162.73	3.648	
10,700.0	7,283.3	10,839.2	7,284.8	83.6	86.8	-90.31	3,419.6	-1,176.4	586.0	418.7	167.24	3.504	
10,800.0	7,281.8	10,938.9	7,283.4	85.8	88.9	-90.32	3,519.2	-1,170.5	578.3	406.6	171.75	3.367	
10,856.4	7,280.9	10,995.1	7,282.5	87.1	90.1	-90.33	3,575.3	-1,167.1	574.0	399.7	174.30	3.293	
10,900.0	7,280.2	11,038.7	7,281.9	88.0	91.1	-90.32	3,618.7	-1,164.5	571.1	395.3	175.75	3.249	
11,000.0	7,278.7	11,138.6	7,280.5	90.0	93.2	-90.30	3,718.4	-1,158.6	566.7	387.9	178.79	3.170	
11,065.3	7,277.7	11,203.9	7,279.5	91.3	94.6	-90.29	3,783.6	-1,154.7	565.7	385.1	180.67	3.131	
11,100.0	7,277.2	11,238.5	7,279.0	92.0	95.4	-90.29	3,818.2	-1,152.7	565.6	383.4	182.19	3.105	
11,200.0	7,275.6	11,338.5	7,277.6	94.2	97.5	-90.30	3,918.0	-1,146.7	565.3	378.6	186.71	3.028	
11,300.0	7,274.1	11,438.5	7,276.1	96.5	99.7	-90.31	4,017.9	-1,140.8	565.0	373.7	191.24	2.954	
11,400.0	7,272.5	11,538.5	7,274.7	98.7	101.9	-90.32	4,117.7	-1,134.9	564.6	368.9	195.77	2.884	
11,500.0	7,271.0	11,638.5	7,273.2	101.0	104.1	-90.33	4,217.5	-1,128.9	564.3	364.0	200.30	2.817	
11,600.0	7,269.5	11,738.5	7,271.8	103.2	106.3	-90.34	4,317.3	-1,123.0	564.0	359.1	204.84	2.753	
11,700.0	7,267.9	11,838.5	7,270.3	105.5	108.5	-90.35	4,417.1	-1,117.1	563.7	354.3	209.39	2.692	
11,721.8	7,267.6	11,860.4	7,270.0	106.0	109.0	-90.35	4,438.9	-1,115.8	563.6	353.2	210.38	2.679	
11,760.0	7,267.0	11,861.4	7,270.0	106.8	109.0	-90.35	4,439.9	-1,115.7	564.7	353.4	211.28	2.673 SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-0.50	15.1	-0.1	15.1	15.1	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	-0.50	15.1	-0.1	15.1	14.8	0.27	54.906	
200.0	200.0	200.0	200.0	0.4	0.4	-0.50	15.1	-0.1	15.1	14.3	0.82	18.302	
300.0	300.0	300.0	300.0	0.7	0.7	-0.50	15.1	-0.1	15.1	13.7	1.37	10.981	
400.0	400.0	400.0	400.0	1.0	1.0	-0.50	15.1	-0.1	15.1	13.2	1.92	7.844	
500.0	500.0	500.0	500.0	1.2	1.2	-0.50	15.1	-0.1	15.1	12.6	2.47	6.101	
600.0	600.0	600.0	600.0	1.5	1.5	-0.50	15.1	-0.1	15.1	12.1	3.02	4.991	
700.0	700.0	700.0	700.0	1.8	1.8	-0.50	15.1	-0.1	15.1	11.5	3.57	4.224	
800.0	800.0	800.0	800.0	2.1	2.1	-0.50	15.1	-0.1	15.1	11.0	4.12	3.660	CC, ES
900.0	900.0	900.0	900.0	2.3	2.3	120.68	15.1	-0.1	15.7	11.1	4.65	3.381	
1,000.0	999.9	999.9	999.9	2.5	2.6	131.44	15.1	-0.1	18.0	12.9	5.16	3.495	
1,100.0	1,099.7	1,100.3	1,100.2	2.8	2.9	143.18	14.0	-0.9	21.6	16.0	5.65	3.825	
1,200.0	1,199.3	1,200.7	1,200.6	3.1	3.1	153.86	10.9	-3.3	25.5	19.4	6.12	4.170	
1,300.0	1,298.6	1,301.2	1,300.9	3.4	3.3	163.74	5.7	-7.4	30.0	23.4	6.60	4.543	
1,400.0	1,397.5	1,401.8	1,401.0	3.7	3.6	172.81	-1.7	-13.0	35.2	28.1	7.08	4.963	
1,414.8	1,412.1	1,416.6	1,415.8	3.8	3.6	174.08	-2.9	-13.9	36.0	28.8	7.16	5.028	
1,500.0	1,496.2	1,502.3	1,500.9	4.1	3.9	-178.96	-11.1	-20.2	40.3	32.7	7.60	5.302	
1,600.0	1,595.0	1,602.1	1,599.8	4.5	4.2	-172.04	-21.2	-28.0	45.2	37.0	8.15	5.545	
1,700.0	1,693.7	1,701.8	1,698.7	4.9	4.5	-166.53	-31.4	-35.8	50.7	41.9	8.75	5.791	
1,800.0	1,792.4	1,801.6	1,797.6	5.3	4.8	-162.13	-41.5	-43.5	56.5	47.1	9.38	6.023	
1,900.0	1,891.1	1,901.3	1,896.6	5.7	5.2	-158.56	-51.6	-51.3	62.6	52.5	10.04	6.234	
2,000.0	1,989.8	2,001.0	1,995.5	6.2	5.5	-155.64	-61.8	-59.1	68.9	58.1	10.72	6.422	
2,100.0	2,088.5	2,100.8	2,094.4	6.6	5.9	-153.21	-71.9	-66.9	75.3	63.9	11.43	6.588	
2,200.0	2,187.2	2,200.5	2,193.3	7.0	6.3	-151.16	-82.1	-74.7	81.9	69.7	12.15	6.736	
2,300.0	2,285.9	2,300.3	2,292.3	7.5	6.6	-149.42	-92.2	-82.4	88.5	75.6	12.89	6.866	
2,400.0	2,384.6	2,400.0	2,391.2	7.9	7.0	-147.93	-102.4	-90.2	95.2	81.6	13.64	6.982	
2,500.0	2,483.3	2,499.8	2,490.1	8.4	7.4	-146.63	-112.5	-98.0	102.0	87.6	14.39	7.085	
2,600.0	2,582.0	2,599.5	2,589.0	8.8	7.8	-145.49	-122.6	-105.8	108.8	93.6	15.16	7.177	
2,700.0	2,680.7	2,699.3	2,687.9	9.3	8.2	-144.49	-132.8	-113.6	115.6	99.7	15.93	7.260	
2,800.0	2,779.4	2,799.0	2,786.9	9.7	8.5	-143.60	-142.9	-121.3	122.5	105.8	16.70	7.335	
2,900.0	2,878.2	2,898.8	2,885.8	10.2	8.9	-142.81	-153.1	-129.1	129.4	112.0	17.49	7.403	
3,000.0	2,976.9	2,998.5	2,984.7	10.7	9.3	-142.09	-163.2	-136.9	136.4	118.1	18.27	7.464	
3,100.0	3,075.6	3,098.2	3,083.6	11.1	9.7	-141.45	-173.4	-144.7	143.3	124.3	19.06	7.520	
3,200.0	3,174.3	3,198.0	3,182.6	11.6	10.1	-140.86	-183.5	-152.4	150.3	130.4	19.85	7.571	
3,300.0	3,273.0	3,297.7	3,281.5	12.0	10.5	-140.33	-193.6	-160.2	157.3	136.6	20.64	7.618	
3,400.0	3,371.7	3,397.5	3,380.4	12.5	10.9	-139.84	-203.8	-168.0	164.3	142.8	21.44	7.662	
3,500.0	3,470.4	3,497.2	3,479.3	13.0	11.3	-139.39	-213.9	-175.8	171.3	149.0	22.24	7.702	
3,600.0	3,569.1	3,597.0	3,578.3	13.4	11.7	-138.98	-224.1	-183.6	178.3	155.2	23.04	7.739	
3,700.0	3,667.8	3,696.7	3,677.2	13.9	12.1	-138.60	-234.2	-191.3	185.3	161.5	23.84	7.773	
3,800.0	3,766.5	3,796.5	3,776.1	14.3	12.5	-138.25	-244.4	-199.1	192.3	167.7	24.64	7.805	
3,900.0	3,865.2	3,895.1	3,874.0	14.8	12.9	-138.00	-254.1	-206.6	199.5	174.1	25.41	7.850	
4,000.0	3,963.9	3,992.1	3,970.5	15.3	13.1	-138.48	-261.6	-212.4	207.7	181.7	26.01	7.986	
4,100.0	4,062.6	4,088.6	4,066.8	15.7	13.4	-139.71	-266.5	-216.1	217.4	190.9	26.51	8.201	
4,200.0	4,161.4	4,184.5	4,162.7	16.2	13.6	-141.57	-268.7	-217.8	228.6	201.7	26.89	8.499	
4,300.0	4,260.1	4,281.9	4,260.1	16.7	13.8	-143.84	-268.9	-218.0	241.3	214.0	27.22	8.863	
4,400.0	4,358.8	4,380.6	4,358.8	17.1	14.0	-145.96	-268.9	-218.0	254.4	226.9	27.54	9.237	
4,500.0	4,457.5	4,479.3	4,457.5	17.6	14.2	-147.87	-268.9	-218.0	267.9	240.0	27.88	9.608	
4,584.5	4,540.9	4,562.7	4,540.9	18.0	14.3	-149.34	-268.9	-218.0	279.5	251.3	28.18	9.917	
4,600.0	4,556.2	4,578.0	4,556.2	18.1	14.4	-149.62	-268.9	-218.0	281.6	253.4	28.24	9.973	
4,700.0	4,655.2	4,677.1	4,655.2	18.4	14.6	-151.09	-268.9	-218.0	293.6	265.1	28.56	10.282	
4,800.0	4,754.7	4,776.5	4,754.7	18.6	14.8	-152.12	-268.9	-218.0	302.7	273.8	28.89	10.476	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,876.3	4,854.5	18.9	15.0	-152.77	-268.9	-218.0	308.7	279.5	29.24	10.559	
5,000.0	4,954.4	4,976.2	4,954.4	19.1	15.2	-153.07	-268.9	-218.0	311.7	282.1	29.58	10.536	
5,045.6	5,000.0	5,021.8	5,000.0	19.1	15.3	89.98	-268.9	-218.0	312.0	282.2	29.86	10.450	
5,100.0	5,054.4	5,076.2	5,054.4	19.2	15.4	89.98	-268.9	-218.0	312.0	281.9	30.09	10.369	
5,200.0	5,154.4	5,176.2	5,154.4	19.4	15.6	89.98	-268.9	-218.0	312.0	281.5	30.52	10.224	
5,300.0	5,254.4	5,276.2	5,254.4	19.6	15.8	89.98	-268.9	-218.0	312.0	281.1	30.95	10.083	
5,400.0	5,354.4	5,376.2	5,354.4	19.8	16.0	89.98	-268.9	-218.0	312.0	280.7	31.38	9.944	
5,500.0	5,454.4	5,476.2	5,454.4	19.9	16.2	89.98	-268.9	-218.0	312.0	280.2	31.82	9.807	
5,600.0	5,554.4	5,576.2	5,554.4	20.1	16.5	89.98	-268.9	-218.0	312.0	279.8	32.26	9.674	
5,700.0	5,654.4	5,676.2	5,654.4	20.3	16.7	89.98	-268.9	-218.0	312.0	279.3	32.70	9.542	
5,800.0	5,754.4	5,776.2	5,754.4	20.5	16.9	89.98	-268.9	-218.0	312.0	278.9	33.15	9.414	
5,900.0	5,854.4	5,876.2	5,854.4	20.7	17.1	89.98	-268.9	-218.0	312.0	278.4	33.60	9.288	
6,000.0	5,954.4	5,976.2	5,954.4	20.9	17.3	89.98	-268.9	-218.0	312.0	278.0	34.05	9.165	
6,100.0	6,054.4	6,076.2	6,054.4	21.0	17.6	89.98	-268.9	-218.0	312.0	277.5	34.50	9.044	
6,200.0	6,154.4	6,176.2	6,154.4	21.2	17.8	89.98	-268.9	-218.0	312.0	277.1	34.96	8.925	
6,300.0	6,254.4	6,276.2	6,254.4	21.4	18.0	89.98	-268.9	-218.0	312.0	276.6	35.42	8.809	
6,400.0	6,354.4	6,376.2	6,354.4	21.6	18.3	89.98	-268.9	-218.0	312.0	276.1	35.88	8.696	
6,500.0	6,454.4	6,476.2	6,454.4	21.8	18.5	89.98	-268.9	-218.0	312.0	275.7	36.35	8.584	
6,535.8	6,490.2	6,512.1	6,490.2	21.9	18.6	89.90	-268.4	-218.0	312.0	275.5	36.50	8.548	
6,609.3	6,563.6	6,584.9	6,562.8	22.0	18.7	88.79	-262.4	-218.0	312.1	275.4	36.70	8.504	
6,650.0	6,604.4	6,624.8	6,602.2	22.1	18.8	88.79	-256.2	-218.0	312.3	275.6	36.66	8.517	
6,700.0	6,654.2	6,673.5	6,649.7	22.2	18.8	87.62	-245.8	-218.0	312.7	276.0	36.70	8.519	
6,750.0	6,703.6	6,721.7	6,696.1	22.3	18.8	86.47	-232.6	-218.0	313.2	276.5	36.71	8.533	
6,800.0	6,752.4	6,769.6	6,741.2	22.3	18.9	85.34	-216.6	-218.0	313.9	277.2	36.69	8.556	
6,850.0	6,800.4	6,817.1	6,784.9	22.4	18.9	84.24	-198.0	-218.0	314.8	278.2	36.66	8.587	
6,900.0	6,847.4	6,864.3	6,827.1	22.4	18.9	83.17	-176.8	-218.0	315.8	279.2	36.63	8.623	
6,950.0	6,893.2	6,911.2	6,867.6	22.4	18.9	82.14	-153.2	-218.0	317.0	280.4	36.59	8.662	
7,000.0	6,937.6	6,957.8	6,906.4	22.4	18.9	81.15	-127.4	-218.0	318.2	281.7	36.57	8.702	
7,050.0	6,980.3	7,004.1	6,943.3	22.4	18.9	80.21	-99.4	-218.0	319.6	283.0	36.56	8.741	
7,100.0	7,021.3	7,050.0	6,978.1	22.4	18.9	79.31	-69.5	-218.0	321.0	284.4	36.58	8.776	
7,150.0	7,060.4	7,095.9	7,011.1	22.4	18.9	78.47	-37.6	-218.0	322.5	285.9	36.63	8.805	
7,200.0	7,097.3	7,141.5	7,041.9	22.4	18.9	77.68	-4.0	-218.0	324.0	287.3	36.72	8.824	
7,250.0	7,131.9	7,186.9	7,070.5	22.4	18.9	76.94	31.2	-218.0	325.5	288.7	36.85	8.833	
7,300.0	7,164.0	7,232.0	7,096.8	22.4	19.0	76.27	67.9	-218.0	327.1	290.0	37.05	8.828	
7,350.0	7,193.7	7,277.0	7,120.9	22.4	19.1	75.65	105.9	-218.0	328.6	291.3	37.31	8.808	
7,400.0	7,220.6	7,321.9	7,142.5	22.5	19.3	75.09	145.2	-218.0	330.1	292.5	37.62	8.774	
7,450.0	7,244.7	7,366.6	7,161.8	22.6	19.6	74.59	185.5	-218.0	331.6	293.5	38.03	8.718	
7,500.0	7,265.8	7,411.1	7,178.7	22.7	19.9	74.15	226.7	-218.0	333.0	294.5	38.52	8.645	
7,550.0	7,284.0	7,455.6	7,193.1	22.9	20.3	73.78	268.8	-218.1	334.3	295.2	39.08	8.554	
7,600.0	7,299.1	7,500.0	7,205.0	23.1	20.8	73.47	311.6	-218.1	335.6	295.9	39.74	8.445	
7,650.0	7,311.1	7,544.3	7,214.4	23.4	21.2	73.22	354.9	-218.1	336.8	296.3	40.49	8.318	
7,700.0	7,319.8	7,588.5	7,221.2	23.9	21.7	73.03	398.6	-218.1	337.8	296.5	41.32	8.176	
7,750.0	7,325.3	7,632.8	7,225.6	24.3	22.2	72.91	442.6	-218.1	338.8	296.6	42.24	8.020	
7,800.0	7,327.5	7,677.0	7,227.3	24.9	22.8	72.85	486.7	-218.1	339.7	296.4	43.25	7.855	
7,821.0	7,327.5	7,695.5	7,227.3	25.1	23.1	72.84	505.3	-218.1	340.0	296.3	43.69	7.783	
7,821.2	7,327.5	7,695.8	7,227.3	25.1	23.1	72.84	505.5	-218.1	340.0	296.3	43.69	7.782	
7,822.2	7,327.5	7,696.7	7,227.3	25.2	23.1	72.84	506.5	-218.1	340.0	296.3	43.72	7.778	
7,900.0	7,326.3	7,774.5	7,226.2	26.1	24.2	72.93	584.3	-218.1	341.2	295.5	45.68	7.470	
8,000.0	7,324.8	7,874.5	7,224.9	27.5	25.7	73.05	684.3	-218.1	342.8	294.2	48.60	7.053	
8,100.0	7,323.2	7,974.5	7,223.6	29.0	27.3	73.16	784.2	-218.1	344.3	292.5	51.75	6.653	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-221 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,200.0	7,321.7	8,074.5	7,222.3	30.7	29.0	73.27	884.2	-218.2	345.8	290.7	55.10	6.276	
8,300.0	7,320.2	8,174.5	7,220.9	32.4	30.8	73.39	984.2	-218.2	347.4	288.7	58.62	5.926	
8,400.0	7,318.6	8,274.4	7,219.6	34.2	32.7	73.50	1,084.2	-218.2	348.9	286.6	62.27	5.603	
8,500.0	7,317.1	8,374.4	7,218.3	36.1	34.6	73.61	1,184.1	-218.2	350.4	284.4	66.04	5.306	
8,600.0	7,315.5	8,474.4	7,217.0	38.0	36.6	73.72	1,284.1	-218.2	352.0	282.1	69.91	5.035	
8,700.0	7,314.0	8,574.4	7,215.6	40.0	38.6	73.82	1,384.1	-218.2	353.5	279.7	73.86	4.786	
8,800.0	7,312.5	8,674.4	7,214.3	42.0	40.7	73.93	1,484.1	-218.2	355.1	277.2	77.88	4.559	
8,900.0	7,310.9	8,774.4	7,213.0	44.0	42.8	74.04	1,584.1	-218.3	356.6	274.7	81.97	4.351	
9,000.0	7,309.4	8,874.4	7,211.7	46.1	44.9	74.14	1,684.0	-218.3	358.2	272.1	86.10	4.160	
9,100.0	7,307.9	8,974.4	7,210.3	48.2	47.0	74.25	1,784.0	-218.3	359.7	269.4	90.28	3.984	
9,200.0	7,306.3	9,074.3	7,209.0	50.3	49.1	74.35	1,884.0	-218.3	361.3	266.8	94.51	3.823	
9,300.0	7,304.8	9,174.3	7,207.7	52.4	51.3	74.45	1,984.0	-218.3	362.8	264.1	98.76	3.674	
9,400.0	7,303.3	9,274.3	7,206.3	54.6	53.5	74.56	2,083.9	-218.3	364.4	261.3	103.05	3.536	
9,500.0	7,301.7	9,374.3	7,205.0	56.8	55.7	74.66	2,183.9	-218.4	365.9	258.6	107.37	3.408	
9,600.0	7,300.2	9,474.3	7,203.7	58.9	57.9	74.76	2,283.9	-218.4	367.5	255.8	111.71	3.290	
9,700.0	7,298.7	9,574.3	7,202.4	61.1	60.1	74.86	2,383.9	-218.4	369.0	253.0	116.07	3.179	
9,800.0	7,297.1	9,674.3	7,201.0	63.3	62.3	74.95	2,483.8	-218.4	370.6	250.1	120.46	3.076	
9,900.0	7,295.6	9,774.2	7,199.7	65.6	64.6	75.05	2,583.8	-218.4	372.1	247.3	124.86	2.980	
10,000.0	7,294.1	9,874.2	7,198.4	67.8	66.8	75.15	2,683.8	-218.4	373.7	244.4	129.28	2.891	
10,100.0	7,292.5	9,974.2	7,197.1	70.0	69.0	75.25	2,783.8	-218.5	375.3	241.5	133.72	2.806	
10,200.0	7,291.0	10,074.2	7,195.7	72.3	71.3	75.34	2,883.8	-218.5	376.8	238.7	138.17	2.727	
10,300.0	7,289.5	10,174.2	7,194.4	74.5	73.6	75.44	2,983.7	-218.5	378.4	235.8	142.63	2.653	
10,400.0	7,287.9	10,274.2	7,193.1	76.8	75.8	75.53	3,083.7	-218.5	379.9	232.8	147.11	2.583	
10,500.0	7,286.4	10,374.2	7,191.8	79.0	78.1	75.62	3,183.7	-218.5	381.5	229.9	151.59	2.517	
10,600.0	7,284.8	10,474.1	7,190.4	81.3	80.4	75.71	3,283.7	-218.5	383.1	227.0	156.09	2.454	
10,700.0	7,283.3	10,574.1	7,189.1	83.6	82.6	75.81	3,383.6	-218.5	384.6	224.0	160.59	2.395	
10,800.0	7,281.8	10,674.1	7,187.8	85.8	84.9	75.90	3,483.6	-218.6	386.2	221.1	165.11	2.339	
10,856.4	7,280.9	10,730.5	7,187.0	87.1	86.2	75.95	3,540.0	-218.6	387.1	219.4	167.66	2.309	
10,900.0	7,280.2	10,774.1	7,186.5	88.0	87.2	75.99	3,583.6	-218.6	387.5	218.1	169.38	2.288	
11,000.0	7,278.7	10,874.1	7,185.1	90.0	89.5	75.98	3,683.6	-218.6	385.8	212.9	172.95	2.231	
11,065.3	7,277.7	10,939.3	7,184.3	91.3	91.0	75.91	3,748.8	-218.6	383.0	207.8	175.12	2.187	
11,100.0	7,277.2	10,974.0	7,183.8	92.0	91.8	75.84	3,783.4	-218.6	381.1	204.5	176.57	2.158	
11,200.0	7,275.6	11,073.8	7,182.5	94.2	94.1	75.67	3,883.3	-218.6	375.6	194.7	180.88	2.076	
11,300.0	7,274.1	11,173.6	7,181.2	96.5	96.4	75.48	3,983.1	-218.6	370.1	184.9	185.18	1.998	
11,400.0	7,272.5	11,273.5	7,179.8	98.7	98.7	75.29	4,082.9	-218.7	364.6	175.1	189.47	1.924	
11,500.0	7,271.0	11,373.3	7,178.5	101.0	101.0	75.10	4,182.8	-218.7	359.1	165.3	193.75	1.853	
11,600.0	7,269.5	11,473.2	7,177.2	103.2	103.3	74.90	4,282.6	-218.7	353.6	155.6	198.03	1.786	
11,700.0	7,267.9	11,573.0	7,175.9	105.5	105.6	74.69	4,382.4	-218.7	348.1	145.8	202.29	1.721	
11,760.0	7,267.0	11,632.9	7,175.1	106.8	106.9	74.56	4,442.3	-218.7	344.8	140.0	204.84	1.683 SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	178.85	-15.0	0.3	15.0	15.0	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	178.85	-15.0	0.3	15.0	14.7	0.27	54.601	
200.0	200.0	200.0	200.0	0.4	0.4	178.85	-15.0	0.3	15.0	14.2	0.82	18.200	
300.0	300.0	300.0	300.0	0.7	0.7	178.85	-15.0	0.3	15.0	13.6	1.37	10.920	
400.0	400.0	400.0	400.0	1.0	1.0	178.85	-15.0	0.3	15.0	13.1	1.92	7.800	
500.0	500.0	500.0	500.0	1.2	1.2	178.85	-15.0	0.3	15.0	12.5	2.47	6.067	
600.0	600.0	600.0	600.0	1.5	1.5	178.85	-15.0	0.3	15.0	12.0	3.02	4.964	CC
700.0	700.0	699.9	699.9	1.8	1.8	-176.45	-15.4	-1.0	15.4	11.8	3.55	4.334	ES
800.0	800.0	799.6	799.5	2.1	2.0	-164.01	-16.4	-4.7	17.1	13.0	4.07	4.204	
900.0	900.0	899.2	898.9	2.3	2.3	-34.04	-18.2	-11.0	20.2	15.6	4.58	4.414	
1,000.0	999.9	998.6	997.9	2.5	2.6	-23.80	-20.7	-19.7	23.8	18.7	5.08	4.690	
1,100.0	1,099.7	1,097.9	1,096.5	2.8	2.9	-15.49	-24.0	-30.8	27.8	22.2	5.59	4.972	
1,200.0	1,199.3	1,197.0	1,194.6	3.1	3.2	-8.53	-27.9	-44.4	32.0	25.9	6.10	5.248	
1,300.0	1,298.6	1,296.0	1,292.1	3.4	3.6	-2.52	-32.5	-60.5	36.5	29.9	6.63	5.517	
1,400.0	1,397.5	1,394.8	1,389.1	3.7	4.1	2.78	-37.8	-78.9	41.3	34.2	7.16	5.773	
1,414.8	1,412.1	1,409.4	1,403.4	3.8	4.1	3.52	-38.6	-81.8	42.1	34.8	7.24	5.810	
1,500.0	1,496.2	1,494.5	1,486.6	4.1	4.5	7.37	-43.6	-98.9	46.3	38.6	7.72	5.996	
1,600.0	1,595.0	1,594.3	1,584.2	4.5	5.0	11.06	-49.3	-119.0	51.5	43.2	8.31	6.198	
1,700.0	1,693.7	1,694.1	1,681.8	4.9	5.6	14.06	-55.1	-139.0	56.8	47.9	8.91	6.377	
1,800.0	1,792.4	1,794.0	1,779.4	5.3	6.1	16.55	-60.9	-159.1	62.3	52.8	9.54	6.532	
1,900.0	1,891.1	1,893.8	1,877.0	5.7	6.6	18.62	-66.7	-179.2	67.9	57.7	10.19	6.664	
2,000.0	1,989.8	1,993.6	1,974.6	6.2	7.2	20.39	-72.4	-199.2	73.6	62.7	10.86	6.777	
2,100.0	2,088.5	2,093.4	2,072.2	6.6	7.7	21.89	-78.2	-219.3	79.3	67.8	11.54	6.873	
2,200.0	2,187.2	2,193.2	2,169.8	7.0	8.3	23.20	-84.0	-239.4	85.1	72.8	12.23	6.955	
2,300.0	2,285.9	2,293.0	2,267.4	7.5	8.8	24.34	-89.8	-259.4	90.9	77.9	12.94	7.024	
2,400.0	2,384.6	2,392.9	2,365.0	7.9	9.4	25.34	-95.5	-279.5	96.7	83.0	13.65	7.084	
2,500.0	2,483.3	2,492.7	2,462.7	8.4	9.9	26.22	-101.3	-299.6	102.6	88.2	14.37	7.136	
2,600.0	2,582.0	2,592.5	2,560.3	8.8	10.5	27.02	-107.1	-319.6	108.4	93.3	15.10	7.181	
2,700.0	2,680.7	2,692.3	2,657.9	9.3	11.0	27.73	-112.9	-339.7	114.3	98.5	15.84	7.220	
2,800.0	2,779.4	2,792.1	2,755.5	9.7	11.6	28.37	-118.6	-359.8	120.3	103.7	16.58	7.254	
2,900.0	2,878.2	2,891.9	2,853.1	10.2	12.2	28.94	-124.4	-379.8	126.2	108.9	17.33	7.284	
3,000.0	2,976.9	2,991.7	2,950.7	10.7	12.7	29.47	-130.2	-399.9	132.1	114.1	18.08	7.310	
3,100.0	3,075.6	3,091.6	3,048.3	11.1	13.3	29.95	-136.0	-420.0	138.1	119.3	18.83	7.333	
3,200.0	3,174.3	3,191.4	3,145.9	11.6	13.8	30.40	-141.7	-440.0	144.1	124.5	19.59	7.354	
3,300.0	3,273.0	3,291.2	3,243.5	12.0	14.4	30.80	-147.5	-460.1	150.0	129.7	20.35	7.373	
3,400.0	3,371.7	3,391.0	3,341.1	12.5	15.0	31.18	-153.3	-480.1	156.0	134.9	21.11	7.389	
3,500.0	3,470.4	3,490.8	3,438.7	13.0	15.5	31.53	-159.1	-500.2	162.0	140.1	21.88	7.404	
3,600.0	3,569.1	3,590.6	3,536.3	13.4	16.1	31.85	-164.8	-520.3	168.0	145.3	22.65	7.418	
3,700.0	3,667.8	3,690.5	3,634.0	13.9	16.7	32.15	-170.6	-540.3	174.0	150.6	23.42	7.430	
3,800.0	3,766.5	3,790.3	3,731.6	14.3	17.2	32.43	-176.4	-560.4	180.0	155.8	24.19	7.441	
3,900.0	3,865.2	3,890.1	3,829.2	14.8	17.8	32.70	-182.2	-580.5	186.0	161.0	24.96	7.451	
4,000.0	3,963.9	3,989.9	3,926.8	15.3	18.4	32.94	-187.9	-600.5	192.0	166.3	25.74	7.460	
4,100.0	4,062.6	4,089.7	4,024.4	15.7	18.9	33.17	-193.7	-620.6	198.0	171.5	26.51	7.468	
4,200.0	4,161.4	4,189.5	4,122.0	16.2	19.5	33.39	-199.5	-640.7	204.0	176.7	27.29	7.476	
4,300.0	4,260.1	4,289.4	4,219.6	16.7	20.1	33.60	-205.3	-660.7	210.0	182.0	28.07	7.483	
4,400.0	4,358.8	4,389.2	4,317.2	17.1	20.6	33.79	-211.0	-680.8	216.1	187.2	28.85	7.490	
4,500.0	4,457.5	4,489.0	4,414.8	17.6	21.2	33.97	-216.8	-700.9	222.1	192.4	29.63	7.496	
4,584.5	4,540.9	4,573.4	4,497.3	18.0	21.7	34.12	-221.7	-717.8	227.2	196.9	30.29	7.500	
4,600.0	4,556.2	4,588.8	4,512.4	18.1	21.8	34.15	-222.6	-720.9	228.1	197.7	30.40	7.504	
4,700.0	4,655.2	4,688.5	4,609.9	18.4	22.3	34.09	-228.3	-741.0	236.0	205.0	31.01	7.612	
4,800.0	4,754.7	4,787.9	4,707.1	18.6	22.9	33.62	-234.1	-760.9	246.8	215.4	31.49	7.840	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,886.8	4,803.8	18.9	23.5	32.81	-239.8	-780.8	260.6	228.7	31.84	8.184	
5,000.0	4,954.4	4,985.2	4,900.1	19.1	24.0	31.74	-245.5	-800.6	277.3	245.2	32.09	8.643	
5,045.6	5,000.0	5,029.9	4,943.8	19.1	24.3	-85.72	-248.1	-809.6	286.0	253.6	32.39	8.830	
5,100.0	5,054.4	5,083.1	4,995.8	19.2	24.6	-86.49	-251.2	-820.3	296.7	264.2	32.53	9.122	
5,200.0	5,154.4	5,191.7	5,102.4	19.4	25.0	-87.78	-257.0	-840.4	314.9	282.2	32.75	9.615	
5,300.0	5,254.4	5,302.4	5,211.7	19.6	25.4	-88.72	-261.7	-856.8	329.7	296.6	33.04	9.978	
5,400.0	5,354.4	5,414.2	5,322.8	19.8	25.7	-89.37	-265.3	-869.3	340.8	307.4	33.38	10.210	
5,500.0	5,454.4	5,527.0	5,435.2	19.9	26.0	-89.78	-267.7	-877.7	348.2	314.4	33.75	10.318	
5,600.0	5,554.4	5,640.2	5,548.3	20.1	26.2	-89.98	-268.9	-881.8	351.8	317.7	34.15	10.302	
5,700.0	5,654.4	5,746.3	5,654.4	20.3	26.3	-90.00	-269.0	-882.2	352.2	317.6	34.57	10.188	
5,800.0	5,754.4	5,846.3	5,754.4	20.5	26.5	-90.00	-269.0	-882.2	352.2	317.2	34.99	10.066	
5,900.0	5,854.4	5,946.3	5,854.4	20.7	26.6	-90.00	-269.0	-882.2	352.2	316.8	35.41	9.947	
6,000.0	5,954.4	6,046.3	5,954.4	20.9	26.8	-90.00	-269.0	-882.2	352.2	316.4	35.83	9.829	
6,100.0	6,054.4	6,146.3	6,054.4	21.0	26.9	-90.00	-269.0	-882.2	352.2	316.0	36.26	9.713	
6,200.0	6,154.4	6,246.3	6,154.4	21.2	27.1	-90.00	-269.0	-882.2	352.2	315.5	36.69	9.599	
6,300.0	6,254.4	6,346.3	6,254.4	21.4	27.2	-90.00	-269.0	-882.2	352.2	315.1	37.13	9.487	
6,400.0	6,354.4	6,446.3	6,354.4	21.6	27.4	-90.00	-269.0	-882.2	352.2	314.7	37.56	9.377	
6,500.0	6,454.4	6,546.3	6,454.4	21.8	27.5	-90.00	-269.0	-882.2	352.2	314.2	38.00	9.269	
6,607.7	6,562.1	6,654.2	6,562.1	22.0	27.7	-89.00	-262.9	-882.1	352.2	313.5	38.62	9.120	
6,609.3	6,563.6	6,655.8	6,563.6	22.0	27.7	-88.97	-262.7	-882.1	352.2	313.5	38.63	9.117	
6,650.0	6,604.4	6,696.0	6,603.4	22.1	27.7	-87.17	-256.4	-882.0	352.2	313.4	38.75	9.089	
6,700.0	6,654.2	6,745.1	6,651.3	22.2	27.8	-86.15	-246.0	-881.8	352.2	313.1	39.07	9.014	
6,750.0	6,703.6	6,793.7	6,698.1	22.3	27.8	-85.15	-232.7	-881.6	352.2	312.8	39.35	8.950	
6,800.0	6,752.4	6,842.0	6,743.6	22.3	27.8	-84.18	-216.6	-881.3	352.2	312.6	39.58	8.897	
6,850.0	6,800.4	6,889.9	6,787.6	22.4	27.8	-83.23	-197.7	-881.0	352.2	312.4	39.77	8.855	
6,900.0	6,847.4	6,937.5	6,830.1	22.4	27.8	-82.31	-176.4	-880.6	352.2	312.3	39.92	8.823	
6,950.0	6,893.2	6,984.7	6,870.9	22.4	27.8	-81.42	-152.5	-880.2	352.1	312.1	40.02	8.799	
7,000.0	6,937.6	7,031.7	6,909.9	22.4	27.8	-80.56	-126.4	-879.7	352.1	312.0	40.09	8.782	
7,050.0	6,980.3	7,078.3	6,946.9	22.4	27.8	-79.75	-98.2	-879.2	352.0	311.8	40.13	8.771	
7,100.0	7,021.3	7,124.6	6,982.0	22.4	27.8	-78.97	-67.9	-878.7	351.8	311.6	40.16	8.761	
7,150.0	7,060.4	7,170.7	7,015.0	22.4	27.8	-78.23	-35.7	-878.2	351.6	311.4	40.18	8.750	
7,200.0	7,097.3	7,216.6	7,045.9	22.4	27.8	-77.54	-1.8	-877.6	351.3	311.1	40.22	8.735	
7,250.0	7,131.9	7,262.2	7,074.5	22.4	27.8	-76.89	33.7	-876.9	351.0	310.7	40.29	8.711	
7,300.0	7,164.0	7,307.6	7,100.8	22.4	27.8	-76.30	70.7	-876.3	350.6	310.1	40.41	8.674	
7,350.0	7,193.7	7,352.8	7,124.8	22.4	27.8	-75.75	109.1	-875.6	350.0	309.4	40.61	8.621	
7,400.0	7,220.6	7,400.0	7,147.3	22.5	27.9	-75.22	150.5	-874.9	349.5	308.6	40.89	8.547	
7,450.0	7,244.7	7,442.8	7,165.5	22.6	27.9	-74.80	189.2	-874.2	348.7	307.5	41.26	8.452	
7,500.0	7,265.8	7,487.5	7,182.2	22.7	28.0	-74.41	230.7	-873.5	347.9	306.2	41.76	8.332	
7,550.0	7,284.0	7,532.2	7,196.4	22.9	28.1	-74.07	273.0	-872.8	347.0	304.7	42.39	8.188	
7,600.0	7,299.1	7,576.7	7,208.1	23.1	28.3	-73.78	315.9	-872.0	346.0	302.9	43.15	8.020	
7,650.0	7,311.1	7,621.2	7,217.3	23.4	28.5	-73.56	359.4	-871.3	344.9	300.8	44.04	7.831	
7,700.0	7,319.8	7,665.5	7,223.9	23.9	28.7	-73.39	403.3	-870.5	343.6	298.6	45.07	7.624	
7,750.0	7,325.3	7,709.9	7,227.9	24.3	29.0	-73.28	447.4	-869.7	342.3	296.1	46.23	7.404	
7,800.0	7,327.5	7,754.2	7,229.4	24.9	29.3	-73.23	491.7	-869.0	340.8	293.3	47.51	7.173	
7,821.0	7,327.5	7,773.6	7,229.2	25.1	29.4	-73.23	511.2	-868.6	340.2	292.1	48.10	7.072	
7,821.2	7,327.5	7,773.9	7,229.2	25.1	29.4	-73.23	511.4	-868.6	340.2	292.1	48.10	7.071	
7,822.2	7,327.5	7,774.8	7,229.2	25.2	29.5	-73.23	512.4	-868.6	340.1	292.0	48.13	7.067	
7,900.0	7,326.3	7,852.6	7,228.4	26.1	30.1	-73.15	590.1	-867.2	337.5	287.4	50.08	6.739	
8,000.0	7,324.8	7,952.6	7,227.3	27.5	31.2	-73.05	690.0	-865.5	334.1	281.1	52.94	6.310	
8,100.0	7,323.2	8,052.5	7,226.2	29.0	32.4	-72.95	789.9	-863.8	330.7	274.7	56.02	5.903	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-241 - Wellbore #1 - Plan #2 (2-5-16)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,200.0	7,321.7	8,152.4	7,225.1	30.7	33.8	-72.85	889.9	-862.0	327.3	268.0	59.27	5.521	
8,300.0	7,320.2	8,252.4	7,224.0	32.4	35.3	-72.74	989.8	-860.3	323.9	261.2	62.68	5.167	
8,400.0	7,318.6	8,352.3	7,222.9	34.2	36.9	-72.64	1,089.7	-858.5	320.5	254.3	66.21	4.840	
8,500.0	7,317.1	8,452.3	7,221.8	36.1	38.6	-72.53	1,189.6	-856.8	317.1	247.2	69.85	4.539	
8,600.0	7,315.5	8,552.2	7,220.7	38.0	40.4	-72.41	1,289.5	-855.1	313.7	240.1	73.58	4.263	
8,700.0	7,314.0	8,652.1	7,219.6	40.0	42.2	-72.30	1,389.5	-853.3	310.3	232.9	77.38	4.010	
8,800.0	7,312.5	8,752.1	7,218.5	42.0	44.1	-72.18	1,489.4	-851.6	306.9	225.6	81.25	3.777	
8,900.0	7,310.9	8,852.0	7,217.4	44.0	46.0	-72.06	1,589.3	-849.8	303.5	218.3	85.17	3.563	
9,000.0	7,309.4	8,952.0	7,216.3	46.1	48.0	-71.94	1,689.2	-848.1	300.1	211.0	89.13	3.367	
9,100.0	7,307.9	9,051.9	7,215.2	48.2	49.9	-71.81	1,789.1	-846.4	296.7	203.6	93.14	3.186	
9,200.0	7,306.3	9,151.8	7,214.1	50.3	52.0	-71.69	1,889.1	-844.6	293.3	196.1	97.17	3.019	
9,300.0	7,304.8	9,251.8	7,213.0	52.4	54.0	-71.55	1,989.0	-842.9	289.9	188.7	101.24	2.864	
9,400.0	7,303.3	9,351.7	7,211.9	54.6	56.1	-71.42	2,088.9	-841.1	286.5	181.2	105.32	2.721	
9,500.0	7,301.7	9,451.7	7,210.8	56.8	58.2	-71.28	2,188.8	-839.4	283.2	173.7	109.43	2.588	
9,600.0	7,300.2	9,551.6	7,209.7	58.9	60.3	-71.14	2,288.7	-837.7	279.8	166.2	113.55	2.464	
9,700.0	7,298.7	9,651.5	7,208.6	61.1	62.4	-71.00	2,388.7	-835.9	276.4	158.7	117.68	2.349	
9,800.0	7,297.1	9,751.5	7,207.5	63.3	64.5	-70.85	2,488.6	-834.2	273.0	151.2	121.83	2.241	
9,900.0	7,295.6	9,851.4	7,206.4	65.6	66.7	-70.70	2,588.5	-832.4	269.6	143.7	125.98	2.140	
10,000.0	7,294.1	9,951.4	7,205.3	67.8	68.8	-70.54	2,688.4	-830.7	266.3	136.1	130.14	2.046	
10,100.0	7,292.5	10,051.3	7,204.2	70.0	71.0	-70.38	2,788.3	-828.9	262.9	128.6	134.30	1.957	
10,200.0	7,291.0	10,151.2	7,203.1	72.3	73.2	-70.22	2,888.2	-827.2	259.5	121.0	138.47	1.874	
10,300.0	7,289.5	10,251.2	7,202.0	74.5	75.4	-70.05	2,988.2	-825.5	256.1	113.5	142.64	1.796	
10,400.0	7,287.9	10,351.1	7,200.9	76.8	77.6	-69.88	3,088.1	-823.7	252.8	106.0	146.80	1.722	
10,500.0	7,286.4	10,446.2	7,199.8	79.0	79.5	-69.76	3,183.2	-822.7	250.0	99.3	150.74	1.659	
10,547.0	7,285.7	10,489.7	7,199.4	80.1	80.4	-69.78	3,226.6	-823.2	249.7	97.1	152.56	1.637	
10,600.0	7,284.8	10,538.6	7,198.8	81.3	81.3	-69.87	3,275.6	-824.5	250.1	95.5	154.68	1.617	
10,700.0	7,283.3	10,635.0	7,197.8	83.6	83.4	-70.18	3,371.8	-829.0	252.8	93.8	159.00	1.590	
10,800.0	7,281.8	10,735.0	7,196.7	85.8	85.6	-70.53	3,471.6	-834.1	255.9	92.3	163.59	1.564	
10,856.4	7,280.9	10,791.3	7,196.1	87.1	86.9	-70.73	3,527.9	-836.9	257.6	91.4	166.19	1.550	
10,900.0	7,280.2	10,834.9	7,195.6	88.0	87.9	-70.87	3,571.4	-839.2	259.2	91.4	167.81	1.545 SF	
11,000.0	7,278.7	10,934.7	7,194.5	90.0	90.2	-71.36	3,671.1	-844.2	265.4	94.0	171.37	1.549	
11,065.3	7,277.7	10,999.7	7,193.8	91.3	91.7	-71.78	3,736.0	-847.5	271.2	97.5	173.65	1.562	
11,100.0	7,277.2	11,034.2	7,193.4	92.0	92.5	-72.05	3,770.5	-849.2	274.7	99.4	175.30	1.567	
11,200.0	7,275.6	11,133.6	7,192.3	94.2	94.7	-72.80	3,869.7	-854.3	284.7	104.5	180.18	1.580	
11,300.0	7,274.1	11,233.0	7,191.2	96.5	97.0	-73.49	3,969.0	-859.3	294.8	109.7	185.04	1.593	
11,400.0	7,272.5	11,332.5	7,190.1	98.7	99.3	-74.14	4,068.3	-864.4	304.9	115.0	189.87	1.606	
11,500.0	7,271.0	11,431.9	7,189.0	101.0	101.6	-74.74	4,167.6	-869.4	315.1	120.4	194.69	1.618	
11,600.0	7,269.5	11,531.3	7,187.9	103.2	103.9	-75.31	4,266.9	-874.4	325.2	125.8	199.49	1.630	
11,700.0	7,267.9	11,630.8	7,186.8	105.5	106.2	-75.84	4,366.2	-879.5	335.5	131.2	204.27	1.642	
11,760.0	7,267.0	11,690.4	7,186.2	106.8	107.5	-76.15	4,425.8	-882.5	341.6	134.5	207.14	1.649	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-0.60	60.0	-0.6	60.1	60.0	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-0.60	60.0	-0.6	60.1	59.8	0.28	214.264	
200.0	200.0	202.0	202.0	0.4	0.4	-0.60	60.0	-0.6	60.1	59.2	0.83	72.367	
300.0	300.0	302.0	302.0	0.7	0.7	-0.60	60.0	-0.6	60.1	58.7	1.38	43.536	
400.0	400.0	402.0	402.0	1.0	1.0	-0.60	60.0	-0.6	60.1	58.1	1.93	31.132	
500.0	500.0	502.0	502.0	1.2	1.2	-0.60	60.0	-0.6	60.1	57.6	2.48	24.229	
600.0	600.0	602.0	602.0	1.5	1.5	-0.60	60.0	-0.6	60.1	57.0	3.03	19.832	
700.0	700.0	702.0	702.0	1.8	1.8	-0.60	60.0	-0.6	60.1	56.5	3.58	16.786	
800.0	800.0	802.0	802.0	2.1	2.1	-0.60	60.0	-0.6	60.1	55.9	4.13	14.551	CC, ES
900.0	900.0	902.0	902.0	2.3	2.3	117.41	60.0	-0.6	60.6	56.0	4.65	13.033	
1,000.0	999.9	1,001.9	1,001.9	2.5	2.6	120.58	60.0	-0.6	62.5	57.4	5.16	12.110	
1,100.0	1,099.7	1,101.7	1,101.7	2.8	2.9	125.41	60.0	-0.6	66.1	60.4	5.69	11.620	
1,200.0	1,199.3	1,201.3	1,201.3	3.1	3.2	131.29	60.0	-0.6	71.8	65.6	6.23	11.534	
1,300.0	1,298.6	1,300.6	1,300.6	3.4	3.4	137.52	60.0	-0.6	80.1	73.3	6.77	11.828	
1,400.0	1,397.5	1,399.5	1,399.5	3.7	3.7	143.49	60.0	-0.6	91.2	83.9	7.32	12.467	
1,414.8	1,412.1	1,414.1	1,414.1	3.8	3.7	144.33	60.0	-0.6	93.1	85.7	7.40	12.588	
1,500.0	1,496.2	1,498.2	1,498.2	4.1	4.0	148.68	60.0	-0.6	104.6	96.7	7.86	13.294	
1,600.0	1,595.0	1,597.0	1,597.0	4.5	4.3	152.70	60.0	-0.6	118.6	110.2	8.41	14.095	
1,700.0	1,693.7	1,697.4	1,697.4	4.9	4.5	156.37	58.9	-0.2	132.4	123.5	8.93	14.831	
1,800.0	1,792.4	1,798.0	1,797.9	5.3	4.7	160.25	55.2	1.0	145.4	136.0	9.41	15.460	
1,900.0	1,891.1	1,898.3	1,898.0	5.7	4.9	164.34	49.0	3.1	157.9	148.0	9.89	15.967	
2,000.0	1,989.8	1,998.4	1,997.7	6.2	5.2	168.64	40.4	6.0	170.2	159.8	10.39	16.387	
2,100.0	2,088.5	2,097.0	2,095.7	6.6	5.4	172.74	30.5	9.4	182.9	172.0	10.90	16.778	
2,200.0	2,187.2	2,195.3	2,193.5	7.0	5.7	176.31	20.5	12.8	196.3	184.9	11.44	17.169	
2,300.0	2,285.9	2,293.7	2,291.3	7.5	5.9	179.41	10.6	16.2	210.5	198.5	11.99	17.548	
2,400.0	2,384.6	2,392.1	2,389.2	7.9	6.2	-177.88	0.7	19.5	225.1	212.6	12.57	17.909	
2,500.0	2,483.3	2,490.5	2,487.0	8.4	6.5	-175.51	-9.2	22.9	240.2	227.1	13.17	18.247	
2,600.0	2,582.0	2,588.9	2,584.8	8.8	6.8	-173.41	-19.2	26.3	255.7	241.9	13.78	18.562	
2,700.0	2,680.7	2,687.3	2,682.6	9.3	7.1	-171.56	-29.1	29.6	271.5	257.1	14.40	18.854	
2,800.0	2,779.4	2,785.7	2,780.5	9.7	7.4	-169.91	-39.0	33.0	287.5	272.4	15.03	19.124	
2,900.0	2,878.2	2,884.1	2,878.3	10.2	7.7	-168.43	-48.9	36.4	303.7	288.0	15.67	19.374	
3,000.0	2,976.9	2,982.5	2,976.1	10.7	8.1	-167.10	-58.9	39.7	320.1	303.7	16.33	19.605	
3,100.0	3,075.6	3,080.8	3,074.0	11.1	8.4	-165.90	-68.8	43.1	336.6	319.6	16.99	19.818	
3,200.0	3,174.3	3,179.2	3,171.8	11.6	8.7	-164.82	-78.7	46.5	353.3	335.6	17.65	20.016	
3,300.0	3,273.0	3,277.6	3,269.6	12.0	9.0	-163.83	-88.6	49.9	370.1	351.8	18.32	20.200	
3,400.0	3,371.7	3,376.0	3,367.4	12.5	9.4	-162.93	-98.6	53.2	387.0	368.0	19.00	20.370	
3,500.0	3,470.4	3,474.4	3,465.3	13.0	9.7	-162.10	-108.5	56.6	403.9	384.3	19.68	20.529	
3,600.0	3,569.1	3,572.8	3,563.1	13.4	10.1	-161.34	-118.4	60.0	421.0	400.6	20.36	20.677	
3,700.0	3,667.8	3,671.2	3,660.9	13.9	10.4	-160.64	-128.3	63.3	438.1	417.1	21.05	20.816	
3,800.0	3,766.5	3,769.6	3,758.8	14.3	10.7	-159.99	-138.3	66.7	455.3	433.5	21.74	20.945	
3,900.0	3,865.2	3,867.9	3,856.6	14.8	11.1	-159.39	-148.2	70.1	472.5	450.1	22.43	21.067	
4,000.0	3,963.9	3,966.3	3,954.4	15.3	11.4	-158.83	-158.1	73.4	489.8	466.7	23.12	21.181	
4,100.0	4,062.6	4,064.7	4,052.2	15.7	11.8	-158.31	-168.0	76.8	507.1	483.3	23.82	21.288	
4,200.0	4,161.4	4,163.1	4,150.1	16.2	12.1	-157.82	-178.0	80.2	524.4	499.9	24.52	21.389	
4,300.0	4,260.1	4,261.5	4,247.9	16.7	12.5	-157.36	-187.9	83.6	541.8	516.6	25.22	21.484	
4,400.0	4,358.8	4,359.9	4,345.7	17.1	12.8	-156.94	-197.8	86.9	559.2	533.3	25.92	21.574	
4,500.0	4,457.5	4,458.3	4,443.6	17.6	13.2	-156.54	-207.7	90.3	576.7	550.1	26.63	21.659	
4,584.5	4,540.9	4,541.4	4,526.2	18.0	13.5	-156.21	-216.1	93.1	591.5	564.2	27.22	21.728	
4,600.0	4,556.2	4,556.7	4,541.4	18.1	13.5	-156.18	-217.7	93.7	594.1	566.8	27.34	21.735	
4,700.0	4,655.2	4,655.4	4,639.5	18.4	13.9	-155.86	-227.6	97.0	609.6	581.6	28.02	21.757	
4,800.0	4,754.7	4,754.4	4,738.0	18.6	14.2	-155.40	-237.6	100.4	621.9	593.2	28.67	21.691	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,853.7	4,836.7	18.9	14.6	-154.81	-247.6	103.8	631.2	601.9	29.29	21.545	
5,000.0	4,954.4	4,956.1	4,938.6	19.1	15.0	-154.08	-257.6	107.2	637.3	607.4	29.87	21.331	
5,045.6	5,000.0	5,004.9	4,987.2	19.1	15.1	89.32	-261.5	108.5	638.8	608.6	30.18	21.165	
5,100.0	5,054.4	5,063.3	5,045.5	19.2	15.2	89.64	-265.0	109.7	639.8	609.4	30.46	21.007	
5,200.0	5,154.4	5,170.9	5,153.0	19.4	15.5	89.96	-268.6	111.0	641.0	610.0	30.93	20.721	
5,300.0	5,254.4	5,274.3	5,256.4	19.6	15.7	90.00	-269.0	111.1	641.1	609.7	31.37	20.436	
5,400.0	5,354.4	5,374.3	5,356.4	19.8	15.9	90.00	-269.0	111.1	641.1	609.3	31.79	20.165	
5,500.0	5,454.4	5,474.3	5,456.4	19.9	16.1	90.00	-269.0	111.1	641.1	608.9	32.21	19.901	
5,600.0	5,554.4	5,574.3	5,556.4	20.1	16.3	90.00	-269.0	111.1	641.1	608.4	32.64	19.641	
5,700.0	5,654.4	5,674.3	5,656.4	20.3	16.6	90.00	-269.0	111.1	641.1	608.0	33.07	19.386	
5,800.0	5,754.4	5,774.3	5,756.4	20.5	16.8	90.00	-269.0	111.1	641.1	607.6	33.50	19.136	
5,900.0	5,854.4	5,874.3	5,856.4	20.7	17.0	90.00	-269.0	111.1	641.1	607.1	33.94	18.890	
6,000.0	5,954.4	5,974.3	5,956.4	20.9	17.2	90.00	-269.0	111.1	641.1	606.7	34.38	18.648	
6,100.0	6,054.4	6,074.3	6,056.4	21.0	17.4	90.00	-269.0	111.1	641.1	606.3	34.82	18.411	
6,200.0	6,154.4	6,174.3	6,156.4	21.2	17.6	90.00	-269.0	111.1	641.1	605.8	35.27	18.179	
6,300.0	6,254.4	6,274.3	6,256.4	21.4	17.9	90.00	-269.0	111.1	641.1	605.4	35.71	17.950	
6,400.0	6,354.4	6,374.3	6,356.4	21.6	18.1	90.00	-269.0	111.1	641.1	604.9	36.17	17.726	
6,500.0	6,454.4	6,474.3	6,456.4	21.8	18.3	90.00	-269.0	111.1	641.1	604.5	36.62	17.507	
6,572.2	6,526.6	6,546.4	6,528.6	22.0	18.5	90.00	-269.0	111.1	641.1	604.1	36.95	17.350	
6,609.3	6,563.6	6,583.5	6,565.6	22.0	18.6	90.00	-268.9	111.1	641.1	604.0	37.12	17.271	
6,650.0	6,604.4	6,624.3	6,606.4	22.1	18.6	90.94	-267.7	111.1	641.1	603.9	37.24	17.215	
6,700.0	6,654.2	6,674.3	6,656.1	22.2	18.7	90.93	-263.3	111.1	641.2	603.8	37.41	17.138	
6,750.0	6,703.6	6,724.2	6,705.5	22.3	18.8	90.90	-255.6	111.1	641.3	603.8	37.54	17.082	
6,800.0	6,752.4	6,774.2	6,754.3	22.3	18.8	90.88	-244.7	111.1	641.5	603.8	37.64	17.044	
6,850.0	6,800.4	6,824.2	6,802.2	22.4	18.9	90.85	-230.7	111.1	641.7	604.0	37.70	17.022	
6,900.0	6,847.4	6,874.1	6,849.1	22.4	18.9	90.81	-213.5	111.1	642.0	604.3	37.74	17.012	
6,950.0	6,893.2	6,924.1	6,894.8	22.4	18.9	90.78	-193.4	111.1	642.3	604.6	37.76	17.011	
7,000.0	6,937.6	6,974.0	6,939.0	22.4	18.9	90.74	-170.3	111.1	642.7	604.9	37.78	17.014	
7,050.0	6,980.3	7,023.9	6,981.7	22.4	18.9	90.69	-144.3	111.1	643.1	605.3	37.80	17.015	
7,100.0	7,021.3	7,073.8	7,022.5	22.4	18.9	90.65	-115.6	111.1	643.6	605.8	37.84	17.009	
7,150.0	7,060.4	7,123.7	7,061.4	22.4	18.9	90.60	-84.4	111.1	644.1	606.2	37.91	16.990	
7,200.0	7,097.3	7,173.6	7,098.2	22.4	18.9	90.55	-50.6	111.1	644.7	606.7	38.03	16.953	
7,250.0	7,131.9	7,223.5	7,132.6	22.4	19.0	90.49	-14.6	111.1	645.3	607.1	38.20	16.892	
7,300.0	7,164.0	7,273.4	7,164.7	22.4	19.1	90.44	23.6	111.1	646.0	607.5	38.45	16.802	
7,350.0	7,193.7	7,323.3	7,194.2	22.4	19.2	90.38	63.9	111.1	646.6	607.9	38.77	16.679	
7,400.0	7,220.6	7,373.2	7,220.9	22.5	19.4	90.32	105.9	111.1	647.3	608.1	39.18	16.520	
7,450.0	7,244.7	7,423.0	7,244.9	22.6	19.6	90.26	149.6	111.1	648.1	608.4	39.70	16.326	
7,500.0	7,265.8	7,472.9	7,266.0	22.7	19.9	90.20	194.8	111.1	648.8	608.5	40.31	16.095	
7,550.0	7,284.0	7,522.7	7,284.1	22.9	20.3	90.14	241.3	111.1	649.6	608.6	41.03	15.831	
7,600.0	7,299.1	7,572.6	7,299.1	23.1	20.7	90.07	288.8	111.1	650.4	608.5	41.86	15.537	
7,650.0	7,311.1	7,622.5	7,311.0	23.4	21.1	90.01	337.2	111.0	651.2	608.4	42.79	15.218	
7,700.0	7,319.8	7,672.3	7,319.7	23.9	21.6	89.95	386.3	111.0	652.0	608.2	43.82	14.879	
7,750.0	7,325.3	7,722.2	7,325.1	24.3	22.2	89.88	435.9	111.0	652.9	607.9	44.94	14.526	
7,800.0	7,327.5	7,772.0	7,327.4	24.9	22.8	89.82	485.6	111.0	653.7	607.5	46.15	14.165	
7,821.0	7,327.5	7,792.9	7,327.3	25.1	23.0	89.80	506.6	111.0	654.0	607.4	46.67	14.013	
7,821.2	7,327.5	7,793.2	7,327.3	25.1	23.0	89.80	506.8	111.0	654.0	607.4	46.68	14.011	
7,822.2	7,327.5	7,794.1	7,327.3	25.2	23.1	89.80	507.8	111.0	654.1	607.4	46.70	14.005	
7,900.0	7,326.3	7,871.9	7,326.1	26.1	24.1	89.79	585.6	111.0	655.4	606.7	48.68	13.463	
8,000.0	7,324.8	7,971.9	7,324.5	27.5	25.6	89.79	685.5	111.0	657.0	605.4	51.62	12.728	
8,100.0	7,323.2	8,071.9	7,322.9	29.0	27.2	89.78	785.5	111.0	658.7	603.9	54.81	12.019	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20T-321 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,200.0	7,321.7	8,171.9	7,321.3	30.7	28.9	89.77	885.5	111.0	660.4	602.2	58.20	11.347	
8,300.0	7,320.2	8,271.9	7,319.6	32.4	30.6	89.77	985.4	111.0	662.1	600.3	61.76	10.720	
8,400.0	7,318.6	8,371.9	7,318.0	34.2	32.5	89.76	1,085.4	111.0	663.8	598.3	65.47	10.139	
8,500.0	7,317.1	8,471.9	7,316.4	36.1	34.4	89.76	1,185.4	111.0	665.4	596.1	69.29	9.603	
8,600.0	7,315.5	8,571.8	7,314.8	38.0	36.3	89.75	1,285.4	111.0	667.1	593.9	73.22	9.111	
8,700.0	7,314.0	8,671.8	7,313.2	40.0	38.3	89.75	1,385.3	111.0	668.8	591.6	77.23	8.659	
8,800.0	7,312.5	8,771.8	7,311.6	42.0	40.4	89.74	1,485.3	111.0	670.5	589.2	81.32	8.245	
8,900.0	7,310.9	8,871.8	7,310.0	44.0	42.4	89.74	1,585.3	111.0	672.2	586.7	85.47	7.864	
9,000.0	7,309.4	8,971.8	7,308.4	46.1	44.5	89.73	1,685.3	111.0	673.8	584.2	89.67	7.514	
9,100.0	7,307.9	9,071.8	7,306.8	48.2	46.7	89.72	1,785.2	111.0	675.5	581.6	93.92	7.192	
9,200.0	7,306.3	9,171.8	7,305.2	50.3	48.8	89.72	1,885.2	111.0	677.2	579.0	98.21	6.895	
9,300.0	7,304.8	9,271.7	7,303.6	52.4	51.0	89.71	1,985.2	111.0	678.9	576.3	102.53	6.621	
9,400.0	7,303.3	9,371.7	7,302.0	54.6	53.1	89.71	2,085.2	111.0	680.5	573.7	106.89	6.367	
9,500.0	7,301.7	9,471.7	7,300.4	56.8	55.3	89.70	2,185.1	111.0	682.2	570.9	111.27	6.131	
9,600.0	7,300.2	9,571.7	7,298.8	58.9	57.5	89.70	2,285.1	110.9	683.9	568.2	115.68	5.912	
9,700.0	7,298.7	9,671.7	7,297.2	61.1	59.7	89.69	2,385.1	110.9	685.6	565.5	120.11	5.708	
9,800.0	7,297.1	9,771.7	7,295.6	63.3	62.0	89.69	2,485.0	110.9	687.3	562.7	124.56	5.517	
9,900.0	7,295.6	9,871.7	7,294.0	65.6	64.2	89.68	2,585.0	110.9	688.9	559.9	129.03	5.339	
10,000.0	7,294.1	9,971.6	7,292.4	67.8	66.4	89.68	2,685.0	110.9	690.6	557.1	133.51	5.173	
10,100.0	7,292.5	10,071.6	7,290.8	70.0	68.7	89.67	2,785.0	110.9	692.3	554.3	138.01	5.016	
10,200.0	7,291.0	10,171.6	7,289.1	72.3	70.9	89.67	2,884.9	110.9	694.0	551.5	142.52	4.869	
10,300.0	7,289.5	10,271.6	7,287.5	74.5	73.2	89.66	2,984.9	110.9	695.7	548.6	147.04	4.731	
10,400.0	7,287.9	10,371.6	7,285.9	76.8	75.4	89.66	3,084.9	110.9	697.3	545.8	151.57	4.601	
10,500.0	7,286.4	10,471.6	7,284.3	79.0	77.7	89.65	3,184.9	110.9	699.0	542.9	156.11	4.478	
10,600.0	7,284.8	10,571.6	7,282.7	81.3	80.0	89.65	3,284.8	110.9	700.7	540.0	160.66	4.361	
10,700.0	7,283.3	10,671.5	7,281.1	83.6	82.3	89.64	3,384.8	110.9	702.4	537.2	165.22	4.251	
10,800.0	7,281.8	10,771.5	7,279.5	85.8	84.5	89.64	3,484.8	110.9	704.0	534.3	169.78	4.147	
10,856.4	7,280.9	10,827.9	7,278.6	87.1	85.8	89.64	3,541.1	110.9	705.0	532.6	172.36	4.090	
10,900.0	7,280.2	10,871.5	7,277.9	88.0	86.8	89.65	3,584.8	110.9	705.4	531.2	174.17	4.050	
11,000.0	7,278.7	10,971.5	7,276.3	90.0	89.1	89.67	3,684.7	110.9	703.8	525.8	178.04	3.953	
11,065.3	7,277.7	11,036.8	7,275.3	91.3	90.6	89.69	3,750.0	110.9	700.9	520.4	180.45	3.884	
11,100.0	7,277.2	11,071.4	7,274.7	92.0	91.4	89.68	3,784.6	110.9	698.9	517.0	181.98	3.841	
11,200.0	7,275.6	11,171.2	7,273.1	94.2	93.7	89.67	3,884.4	110.9	693.3	506.8	186.52	3.717	
11,300.0	7,274.1	11,271.1	7,271.5	96.5	96.0	89.67	3,984.2	110.9	687.7	496.6	191.08	3.599	
11,400.0	7,272.5	11,370.9	7,269.9	98.7	98.3	89.66	4,084.1	110.9	682.1	486.5	195.64	3.487	
11,500.0	7,271.0	11,470.7	7,268.3	101.0	100.6	89.65	4,183.9	110.8	676.5	476.3	200.20	3.379	
11,600.0	7,269.5	11,570.6	7,266.7	103.2	102.9	89.64	4,283.7	110.8	670.9	466.1	204.77	3.276	
11,700.0	7,267.9	11,670.4	7,265.1	105.5	105.2	89.63	4,383.6	110.8	665.3	455.9	209.34	3.178	
11,760.0	7,267.0	11,730.3	7,264.1	106.8	106.4	89.63	4,443.5	110.8	661.9	450.0	211.95	3.123 SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-0.47	45.0	-0.4	45.0	45.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-0.47	45.0	-0.4	45.0	44.7	0.28	162.039	
200.0	200.0	201.0	201.0	0.4	0.4	-0.47	45.0	-0.4	45.0	44.1	0.83	54.372	
300.0	300.0	301.0	301.0	0.7	0.7	-0.47	45.0	-0.4	45.0	43.6	1.38	32.667	
400.0	400.0	401.0	401.0	1.0	1.0	-0.47	45.0	-0.4	45.0	43.0	1.93	23.347	
500.0	500.0	501.0	501.0	1.2	1.2	-0.47	45.0	-0.4	45.0	42.5	2.48	18.164	
600.0	600.0	601.0	601.0	1.5	1.5	-0.47	45.0	-0.4	45.0	41.9	3.03	14.865	
700.0	700.0	701.0	701.0	1.8	1.8	-0.47	45.0	-0.4	45.0	41.4	3.57	12.580	
800.0	800.0	801.0	801.0	2.1	2.1	-0.47	45.0	-0.4	45.0	40.8	4.12	10.903	CC, ES
900.0	900.0	901.0	901.0	2.3	2.3	117.90	45.0	-0.4	45.6	40.9	4.65	9.799	
1,000.0	999.9	1,000.9	1,000.9	2.5	2.6	122.06	45.0	-0.4	47.5	42.4	5.16	9.208	
1,100.0	1,099.7	1,100.7	1,100.7	2.8	2.9	128.21	45.0	-0.4	51.3	45.6	5.69	9.022	
1,200.0	1,199.3	1,200.3	1,200.3	3.1	3.2	135.32	45.0	-0.4	57.4	51.2	6.22	9.231	
1,300.0	1,298.6	1,299.6	1,299.6	3.4	3.4	142.38	45.0	-0.4	66.3	59.6	6.76	9.810	
1,400.0	1,397.5	1,398.5	1,398.5	3.7	3.7	148.70	45.0	-0.4	78.2	70.9	7.30	10.715	
1,414.8	1,412.1	1,413.1	1,413.1	3.8	3.7	149.57	45.0	-0.4	80.2	72.8	7.38	10.878	
1,500.0	1,496.2	1,497.2	1,497.2	4.1	4.0	154.61	44.2	0.6	92.3	84.5	7.81	11.817	
1,600.0	1,595.0	1,595.4	1,595.4	4.5	4.2	160.29	41.9	3.6	107.4	99.1	8.30	12.942	
1,700.0	1,693.7	1,693.0	1,692.8	4.9	4.4	165.68	38.1	8.6	123.7	114.9	8.79	14.077	
1,800.0	1,792.4	1,789.9	1,789.2	5.3	4.6	170.75	32.9	15.4	141.6	132.3	9.29	15.236	
1,900.0	1,891.1	1,885.9	1,884.6	5.7	4.9	175.47	26.2	24.1	161.2	151.4	9.82	16.420	
2,000.0	1,989.8	1,981.8	1,979.6	6.2	5.2	179.81	18.2	34.6	182.6	172.2	10.37	17.614	
2,100.0	2,088.5	2,078.6	2,075.4	6.6	5.5	-176.64	9.9	45.4	205.0	194.1	10.94	18.742	
2,200.0	2,187.2	2,175.3	2,171.1	7.0	5.8	-173.79	1.6	56.3	228.0	216.5	11.53	19.781	
2,300.0	2,285.9	2,272.0	2,266.9	7.5	6.2	-171.46	-6.6	67.1	251.5	239.4	12.13	20.734	
2,400.0	2,384.6	2,368.8	2,362.7	7.9	6.5	-169.52	-14.9	78.0	275.3	262.6	12.74	21.603	
2,500.0	2,483.3	2,465.5	2,458.5	8.4	6.8	-167.90	-23.2	88.8	299.4	286.0	13.37	22.397	
2,600.0	2,582.0	2,562.3	2,554.2	8.8	7.2	-166.51	-31.5	99.6	323.6	309.6	14.00	23.121	
2,700.0	2,680.7	2,659.0	2,650.0	9.3	7.6	-165.32	-39.8	110.5	348.0	333.4	14.63	23.783	
2,800.0	2,779.4	2,755.7	2,745.8	9.7	7.9	-164.28	-48.1	121.3	372.5	357.2	15.27	24.390	
2,900.0	2,878.2	2,852.5	2,841.6	10.2	8.3	-163.37	-56.4	132.2	397.1	381.2	15.92	24.947	
3,000.0	2,976.9	2,949.2	2,937.3	10.7	8.7	-162.57	-64.7	143.0	421.9	405.3	16.57	25.459	
3,100.0	3,075.6	3,046.0	3,033.1	11.1	9.1	-161.86	-73.0	153.9	446.6	429.4	17.22	25.932	
3,200.0	3,174.3	3,142.7	3,128.9	11.6	9.5	-161.22	-81.3	164.7	471.5	453.6	17.88	26.369	
3,300.0	3,273.0	3,239.4	3,224.6	12.0	9.8	-160.64	-89.6	175.6	496.3	477.8	18.54	26.773	
3,400.0	3,371.7	3,336.2	3,320.4	12.5	10.2	-160.12	-97.9	186.4	521.3	502.1	19.20	27.149	
3,500.0	3,470.4	3,432.9	3,416.2	13.0	10.6	-159.65	-106.2	197.2	546.2	526.4	19.86	27.498	
3,600.0	3,569.1	3,529.7	3,512.0	13.4	11.0	-159.22	-114.5	208.1	571.2	550.7	20.53	27.824	
3,700.0	3,667.8	3,626.4	3,607.7	13.9	11.4	-158.82	-122.8	218.9	596.3	575.1	21.20	28.129	
3,800.0	3,766.5	3,723.1	3,703.5	14.3	11.8	-158.46	-131.1	229.8	621.3	599.4	21.87	28.414	
3,900.0	3,865.2	3,819.9	3,799.3	14.8	12.2	-158.12	-139.3	240.6	646.4	623.8	22.54	28.681	
4,000.0	3,963.9	3,916.6	3,895.0	15.3	12.6	-157.81	-147.6	251.5	671.5	648.3	23.21	28.932	
4,100.0	4,062.6	4,013.4	3,990.8	15.7	13.0	-157.52	-155.9	262.3	696.6	672.7	23.88	29.168	
4,200.0	4,161.4	4,110.1	4,086.6	16.2	13.4	-157.26	-164.2	273.1	721.7	697.1	24.56	29.390	
4,300.0	4,260.1	4,206.8	4,182.4	16.7	13.8	-157.01	-172.5	284.0	746.8	721.6	25.23	29.600	
4,400.0	4,358.8	4,303.6	4,278.1	17.1	14.2	-156.77	-180.8	294.8	772.0	746.1	25.91	29.799	
4,500.0	4,457.5	4,400.3	4,373.9	17.6	14.6	-156.55	-189.1	305.7	797.1	770.5	26.58	29.987	
4,584.5	4,540.9	4,482.1	4,454.8	18.0	15.0	-156.38	-196.1	314.8	818.4	791.2	27.16	30.138	
4,600.0	4,556.2	4,497.1	4,469.7	18.1	15.0	-156.38	-197.4	316.5	822.3	795.0	27.27	30.154	
4,700.0	4,655.2	4,594.3	4,565.9	18.4	15.4	-156.31	-205.7	327.4	845.4	817.5	27.95	30.251	
4,800.0	4,754.7	4,692.1	4,662.8	18.6	15.9	-156.14	-214.1	338.4	865.5	836.9	28.59	30.269	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,854.5	4,790.5	4,760.1	18.9	16.3	-155.86	-222.6	349.4	882.4	853.2	29.20	30.219	
5,000.0	4,954.4	4,889.2	4,857.9	19.1	16.7	-155.48	-231.0	360.5	896.3	866.5	29.77	30.106	
5,045.6	5,000.0	4,934.3	4,902.6	19.1	16.9	87.82	-234.9	365.5	901.6	871.5	30.04	30.014	
5,100.0	5,054.4	4,988.2	4,955.9	19.2	17.1	88.13	-239.5	371.6	907.5	877.2	30.35	29.903	
5,200.0	5,154.4	5,087.2	5,053.9	19.4	17.5	88.68	-248.0	382.7	918.5	887.6	30.91	29.715	
5,300.0	5,254.4	5,205.7	5,171.3	19.6	18.0	89.29	-257.5	395.1	929.0	897.5	31.50	29.489	
5,400.0	5,354.4	5,339.8	5,304.9	19.8	18.3	89.75	-265.0	404.9	936.3	904.2	32.05	29.214	
5,500.0	5,454.4	5,474.7	5,439.7	19.9	18.6	89.98	-268.6	409.7	939.8	907.2	32.56	28.862	
5,600.0	5,554.4	5,590.5	5,555.4	20.1	18.9	90.00	-269.0	410.2	940.2	907.1	33.02	28.469	
5,700.0	5,654.4	5,690.5	5,655.4	20.3	19.1	90.00	-269.0	410.2	940.2	906.7	33.45	28.104	
5,800.0	5,754.4	5,790.5	5,755.4	20.5	19.2	90.00	-269.0	410.2	940.2	906.3	33.88	27.747	
5,900.0	5,854.4	5,890.5	5,855.4	20.7	19.4	90.00	-269.0	410.2	940.2	905.9	34.32	27.396	
6,000.0	5,954.4	5,990.5	5,955.4	20.9	19.6	90.00	-269.0	410.2	940.2	905.4	34.76	27.051	
6,100.0	6,054.4	6,090.5	6,055.4	21.0	19.8	90.00	-269.0	410.2	940.2	905.0	35.20	26.712	
6,200.0	6,154.4	6,190.5	6,155.4	21.2	20.0	90.00	-269.0	410.2	940.2	904.5	35.64	26.379	
6,300.0	6,254.4	6,290.5	6,255.4	21.4	20.2	90.00	-269.0	410.2	940.2	904.1	36.09	26.052	
6,400.0	6,354.4	6,390.5	6,355.4	21.6	20.4	90.00	-269.0	410.2	940.2	903.6	36.54	25.732	
6,500.0	6,454.4	6,490.5	6,455.4	21.8	20.7	90.00	-269.0	410.2	940.2	903.2	36.99	25.417	
6,536.8	6,491.2	6,527.2	6,492.2	21.9	20.7	89.97	-268.5	410.2	940.2	903.0	37.15	25.307	
6,609.3	6,563.6	6,599.1	6,563.8	22.0	20.8	89.60	-262.4	410.2	940.2	902.8	37.44	25.115	
6,650.0	6,604.4	6,639.1	6,603.2	22.1	20.9	90.24	-256.1	410.2	940.3	902.7	37.56	25.035	
6,700.0	6,654.2	6,687.7	6,650.7	22.2	20.9	89.84	-245.7	410.2	940.4	902.8	37.68	24.955	
6,750.0	6,703.6	6,735.9	6,697.0	22.3	20.9	89.44	-232.4	410.2	940.7	902.9	37.78	24.902	
6,800.0	6,752.4	6,783.8	6,742.1	22.3	21.0	89.05	-216.4	410.2	941.1	903.2	37.84	24.872	
6,850.0	6,800.4	6,831.3	6,785.8	22.4	21.0	88.67	-197.7	410.2	941.5	903.6	37.88	24.858	
6,900.0	6,847.4	6,878.5	6,827.9	22.4	20.9	88.29	-176.5	410.2	942.1	904.2	37.90	24.857	
6,950.0	6,893.2	6,925.3	6,868.4	22.4	20.9	87.92	-152.9	410.2	942.7	904.8	37.92	24.862	
7,000.0	6,937.6	6,971.9	6,907.1	22.4	20.9	87.56	-127.0	410.2	943.4	905.4	37.94	24.867	
7,050.0	6,980.3	7,018.2	6,943.9	22.4	20.9	87.21	-99.0	410.2	944.1	906.1	37.97	24.864	
7,100.0	7,021.3	7,064.2	6,978.8	22.4	20.9	86.87	-69.0	410.1	944.9	906.9	38.03	24.848	
7,150.0	7,060.4	7,109.9	7,011.7	22.4	20.8	86.54	-37.2	410.1	945.8	907.6	38.12	24.810	
7,200.0	7,097.3	7,155.5	7,042.4	22.4	20.8	86.23	-3.6	410.1	946.7	908.4	38.26	24.745	
7,250.0	7,131.9	7,200.0	7,070.4	22.4	20.8	85.94	31.0	410.1	947.6	909.1	38.45	24.647	
7,300.0	7,164.0	7,245.9	7,097.2	22.4	20.7	85.66	68.3	410.1	948.6	909.8	38.71	24.505	
7,350.0	7,193.7	7,290.9	7,121.2	22.4	20.7	85.39	106.3	410.1	949.5	910.5	39.04	24.320	
7,400.0	7,220.6	7,335.7	7,142.8	22.5	20.7	85.15	145.5	410.1	950.5	911.1	39.46	24.089	
7,450.0	7,244.7	7,380.3	7,162.1	22.6	20.7	84.93	185.8	410.1	951.5	911.6	39.96	23.811	
7,500.0	7,265.8	7,424.8	7,178.9	22.7	20.8	84.72	227.0	410.1	952.5	912.0	40.56	23.487	
7,550.0	7,284.0	7,469.3	7,193.3	22.9	21.0	84.54	269.1	410.1	953.5	912.3	41.24	23.122	
7,600.0	7,299.1	7,513.6	7,205.1	23.1	21.4	84.38	311.8	410.1	954.5	912.5	42.01	22.718	
7,650.0	7,311.1	7,557.9	7,214.5	23.4	21.8	84.24	355.0	410.1	955.4	912.5	42.88	22.281	
7,700.0	7,319.8	7,600.0	7,221.1	23.9	22.3	84.12	396.7	410.1	956.3	912.5	43.81	21.830	
7,750.0	7,325.3	7,646.2	7,225.6	24.3	22.8	84.02	442.7	410.1	957.2	912.4	44.87	21.334	
7,800.0	7,327.5	7,690.4	7,227.4	24.9	23.3	83.95	486.8	410.1	958.1	912.1	45.98	20.837	
7,821.0	7,327.5	7,708.9	7,227.3	25.1	23.6	83.92	505.3	410.1	958.4	912.0	46.47	20.626	
7,821.2	7,327.5	7,709.2	7,227.3	25.1	23.6	83.93	505.6	410.1	958.4	912.0	46.47	20.624	
7,822.2	7,327.5	7,710.1	7,227.3	25.2	23.6	83.93	506.5	410.1	958.5	912.0	46.50	20.614	
7,900.0	7,326.3	7,787.9	7,226.3	26.1	24.7	83.94	584.3	410.1	959.7	911.3	48.44	19.813	
8,000.0	7,324.8	7,887.9	7,225.0	27.5	26.1	83.97	684.3	410.1	961.4	910.0	51.36	18.720	
8,100.0	7,323.2	7,987.9	7,223.6	29.0	27.7	83.99	784.3	410.1	963.0	908.5	54.52	17.664	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-241 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,200.0	7,321.7	8,087.9	7,222.3	30.7	29.4	84.01	884.3	410.0	964.7	906.8	57.88	16.666	
8,300.0	7,320.2	8,187.9	7,221.0	32.4	31.2	84.03	984.2	410.0	966.3	904.9	61.42	15.732	
8,400.0	7,318.6	8,287.9	7,219.7	34.2	33.0	84.06	1,084.2	410.0	967.9	902.8	65.10	14.868	
8,500.0	7,317.1	8,387.9	7,218.3	36.1	34.9	84.08	1,184.2	410.0	969.6	900.7	68.91	14.071	
8,600.0	7,315.5	8,487.8	7,217.0	38.0	36.8	84.10	1,284.2	410.0	971.2	898.4	72.81	13.339	
8,700.0	7,314.0	8,587.8	7,215.7	40.0	38.8	84.12	1,384.1	410.0	972.9	896.1	76.80	12.667	
8,800.0	7,312.5	8,687.8	7,214.4	42.0	40.8	84.15	1,484.1	410.0	974.5	893.6	80.87	12.051	
8,900.0	7,310.9	8,787.8	7,213.0	44.0	42.9	84.17	1,584.1	410.0	976.2	891.2	85.00	11.485	
9,000.0	7,309.4	8,887.8	7,211.7	46.1	45.0	84.19	1,684.1	410.0	977.8	888.6	89.18	10.965	
9,100.0	7,307.9	8,987.8	7,210.4	48.2	47.1	84.21	1,784.0	409.9	979.4	886.0	93.41	10.486	
9,200.0	7,306.3	9,087.8	7,209.0	50.3	49.2	84.23	1,884.0	409.9	981.1	883.4	97.68	10.044	
9,300.0	7,304.8	9,187.7	7,207.7	52.4	51.3	84.26	1,984.0	409.9	982.7	880.7	101.99	9.636	
9,400.0	7,303.3	9,287.7	7,206.4	54.6	53.5	84.28	2,084.0	409.9	984.4	878.1	106.32	9.258	
9,500.0	7,301.7	9,387.7	7,205.1	56.8	55.7	84.30	2,184.0	409.9	986.0	875.3	110.69	8.908	
9,600.0	7,300.2	9,487.7	7,203.7	58.9	57.9	84.32	2,283.9	409.9	987.7	872.6	115.08	8.582	
9,700.0	7,298.7	9,587.7	7,202.4	61.1	60.1	84.34	2,383.9	409.9	989.3	869.8	119.49	8.279	
9,800.0	7,297.1	9,687.7	7,201.1	63.3	62.3	84.36	2,483.9	409.9	991.0	867.0	123.93	7.996	
9,900.0	7,295.6	9,787.7	7,199.8	65.6	64.5	84.39	2,583.9	409.9	992.6	864.2	128.38	7.732	
10,000.0	7,294.1	9,887.6	7,198.4	67.8	66.7	84.41	2,683.8	409.9	994.2	861.4	132.85	7.484	
10,100.0	7,292.5	9,987.6	7,197.1	70.0	68.9	84.43	2,783.8	409.8	995.9	858.6	137.33	7.252	
10,200.0	7,291.0	10,087.6	7,195.8	72.3	71.2	84.45	2,883.8	409.8	997.5	855.7	141.82	7.034	
10,300.0	7,289.5	10,187.6	7,194.5	74.5	73.4	84.47	2,983.8	409.8	999.2	852.8	146.33	6.828	
11,200.0	7,275.6	11,087.2	7,182.5	94.2	93.9	84.62	3,883.3	409.7	996.6	810.6	186.02	5.358	
11,300.0	7,274.1	11,187.1	7,181.2	96.5	96.2	84.60	3,983.1	409.7	991.0	800.5	190.56	5.201	
11,400.0	7,272.5	11,286.9	7,179.9	98.7	98.4	84.59	4,083.0	409.7	985.4	790.3	195.09	5.051	
11,500.0	7,271.0	11,386.8	7,178.6	101.0	100.7	84.57	4,182.8	409.7	979.8	780.2	199.64	4.908	
11,600.0	7,269.5	11,486.6	7,177.2	103.2	103.0	84.55	4,282.6	409.7	974.2	770.0	204.18	4.771	
11,700.0	7,267.9	11,586.4	7,175.9	105.5	105.3	84.53	4,382.5	409.7	968.6	759.8	208.73	4.640	
11,760.0	7,267.0	11,646.3	7,175.1	106.8	106.7	84.52	4,442.4	409.7	965.2	753.7	211.46	4.564	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Offset Design Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W - Niles Miller 20Y-401 - Wellbore #1 - Plan #1 (12-01-15

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

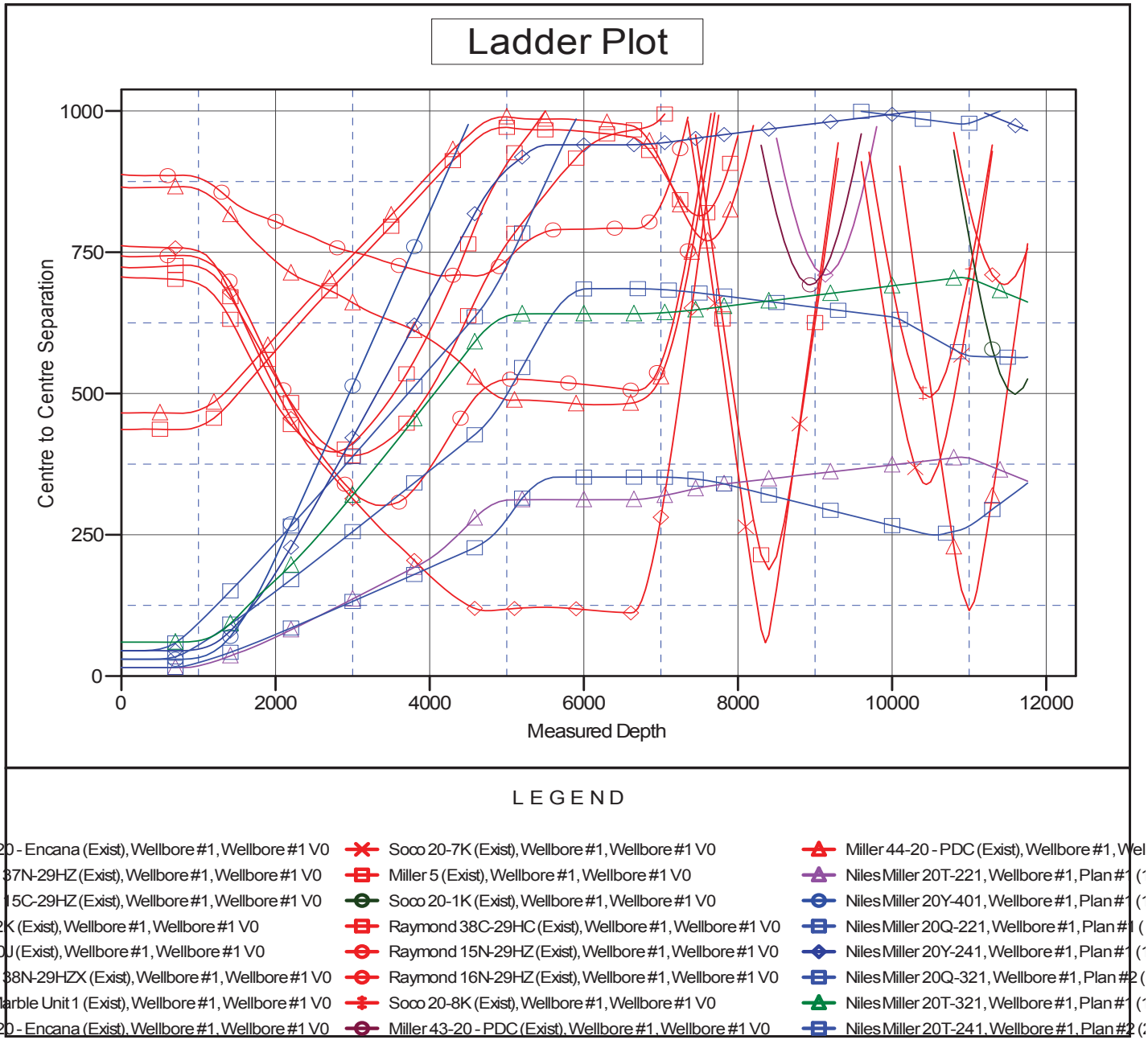
Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-0.52	30.0	-0.3	30.0	30.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-0.52	30.0	-0.3	30.0	29.7	0.28	107.988	
200.0	200.0	201.0	201.0	0.4	0.4	-0.52	30.0	-0.3	30.0	29.1	0.83	36.235	
300.0	300.0	301.0	301.0	0.7	0.7	-0.52	30.0	-0.3	30.0	28.6	1.38	21.770	
400.0	400.0	401.0	401.0	1.0	1.0	-0.52	30.0	-0.3	30.0	28.0	1.93	15.559	
500.0	500.0	501.0	501.0	1.2	1.2	-0.52	30.0	-0.3	30.0	27.5	2.48	12.105	
600.0	600.0	601.0	601.0	1.5	1.5	-0.52	30.0	-0.3	30.0	26.9	3.03	9.906	
700.0	700.0	701.0	701.0	1.8	1.8	-0.52	30.0	-0.3	30.0	26.4	3.57	8.383	
800.0	800.0	801.0	801.0	2.1	2.1	-0.52	30.0	-0.3	30.0	25.8	4.12	7.266	CC, ES
900.0	900.0	901.0	901.0	2.3	2.3	118.58	30.0	-0.3	30.6	25.9	4.65	6.574	
1,000.0	999.9	1,000.9	1,000.9	2.5	2.6	124.61	30.0	-0.3	32.6	27.5	5.16	6.322	SF
1,100.0	1,099.7	1,100.7	1,100.7	2.8	2.9	132.98	30.0	-0.3	36.7	31.1	5.69	6.463	
1,200.0	1,199.3	1,200.3	1,200.3	3.1	3.2	141.75	30.0	-0.3	43.5	37.3	6.22	6.999	
1,300.0	1,298.6	1,299.3	1,299.3	3.4	3.4	150.87	29.5	0.9	53.5	46.8	6.72	7.953	
1,400.0	1,397.5	1,397.4	1,397.3	3.7	3.6	159.90	27.9	4.4	67.6	60.4	7.21	9.377	
1,414.8	1,412.1	1,411.8	1,411.7	3.8	3.7	161.14	27.6	5.1	70.1	62.8	7.28	9.625	
1,500.0	1,496.2	1,494.5	1,494.2	4.1	3.9	167.55	25.5	10.1	85.6	77.9	7.71	11.106	
1,600.0	1,595.0	1,590.7	1,590.0	4.5	4.1	173.63	22.0	18.0	105.9	97.7	8.21	12.892	
1,700.0	1,693.7	1,685.8	1,684.5	4.9	4.4	178.58	17.7	28.0	128.5	119.8	8.74	14.704	
1,800.0	1,792.4	1,779.9	1,777.7	5.3	4.7	-177.30	12.5	40.0	153.4	144.1	9.29	16.523	
1,900.0	1,891.1	1,872.8	1,869.3	5.7	5.0	-173.82	6.5	53.9	180.6	170.7	9.85	18.334	
2,000.0	1,989.8	1,966.4	1,961.4	6.2	5.4	-170.84	-0.4	69.7	209.7	199.3	10.43	20.097	
2,100.0	2,088.5	2,061.5	2,054.8	6.6	5.8	-168.51	-7.4	85.9	239.4	228.4	11.03	21.700	
2,200.0	2,187.2	2,156.6	2,148.2	7.0	6.1	-166.70	-14.4	102.2	269.4	257.8	11.64	23.147	
2,300.0	2,285.9	2,251.7	2,241.6	7.5	6.6	-165.25	-21.5	118.4	299.6	287.3	12.25	24.451	
2,400.0	2,384.6	2,346.8	2,335.1	7.9	7.0	-164.06	-28.5	134.6	329.9	317.0	12.87	25.626	
2,500.0	2,483.3	2,441.9	2,428.5	8.4	7.4	-163.07	-35.5	150.8	360.4	346.9	13.50	26.690	
2,600.0	2,582.0	2,536.9	2,521.9	8.8	7.8	-162.24	-42.6	167.0	390.9	376.8	14.13	27.655	
2,700.0	2,680.7	2,632.0	2,615.4	9.3	8.3	-161.52	-49.6	183.3	421.5	406.7	14.77	28.533	
2,800.0	2,779.4	2,727.1	2,708.8	9.7	8.7	-160.91	-56.6	199.5	452.1	436.7	15.41	29.334	
2,900.0	2,878.2	2,822.2	2,802.2	10.2	9.2	-160.37	-63.6	215.7	482.8	466.7	16.06	30.068	
3,000.0	2,976.9	2,917.3	2,895.6	10.7	9.7	-159.89	-70.7	231.9	513.5	496.8	16.70	30.741	
3,100.0	3,075.6	3,012.4	2,989.1	11.1	10.1	-159.47	-77.7	248.2	544.3	526.9	17.35	31.361	
3,200.0	3,174.3	3,107.4	3,082.5	11.6	10.6	-159.10	-84.7	264.4	575.0	557.0	18.01	31.934	
3,300.0	3,273.0	3,202.5	3,175.9	12.0	11.1	-158.76	-91.8	280.6	605.8	587.1	18.66	32.464	
3,400.0	3,371.7	3,297.6	3,269.3	12.5	11.5	-158.45	-98.8	296.8	636.6	617.3	19.32	32.955	
3,500.0	3,470.4	3,392.7	3,362.8	13.0	12.0	-158.17	-105.8	313.0	667.4	647.5	19.98	33.412	
3,600.0	3,569.1	3,487.8	3,456.2	13.4	12.5	-157.92	-112.9	329.3	698.3	677.6	20.64	33.838	
3,700.0	3,667.8	3,582.9	3,549.6	13.9	12.9	-157.69	-119.9	345.5	729.1	707.8	21.30	34.236	
3,800.0	3,766.5	3,678.0	3,643.0	14.3	13.4	-157.48	-126.9	361.7	760.0	738.0	21.96	34.609	
3,900.0	3,865.2	3,773.0	3,736.5	14.8	13.9	-157.28	-134.0	377.9	790.8	768.2	22.62	34.958	
4,000.0	3,963.9	3,868.1	3,829.9	15.3	14.4	-157.10	-141.0	394.1	821.7	798.4	23.29	35.286	
4,100.0	4,062.6	3,963.2	3,923.3	15.7	14.9	-156.93	-148.0	410.4	852.6	828.6	23.95	35.595	
4,200.0	4,161.4	4,058.3	4,016.8	16.2	15.3	-156.78	-155.1	426.6	883.5	858.8	24.62	35.886	
4,300.0	4,260.1	4,153.4	4,110.2	16.7	15.8	-156.63	-162.1	442.8	914.3	889.1	25.29	36.160	
4,400.0	4,358.8	4,248.5	4,203.6	17.1	16.3	-156.49	-169.1	459.0	945.2	919.3	25.95	36.420	
4,500.0	4,457.5	4,343.6	4,297.0	17.6	16.8	-156.37	-176.1	475.2	976.1	949.5	26.62	36.665	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4968.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Niles Miller 20T-301
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.46°



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Niles Miller 20T-301
Project:	SEC.20-T3N-R66W	**TVD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Reference Site:	Niles Miller 3N66W20Y Pad Sec.20-T3N-R66W	**MD Reference:**	WELL @ 4968.0ft (Original Well Elev)
Site Error:	0.0 ft	**North Reference:**	True
Reference Well:	Niles Miller 20T-301	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (2-5-16)	**Offset TVD Reference:**	Offset Datum

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