



Scientific Drilling

**NM OIL CONSERVATION
ARTESIA DISTRICT**

DEC 13 2018

Devon Energy

Eddy County, NM (NAD83 NME)

Spud Muffin 31-30

624H

OH

Plan #1

RECEIVED

30-015-45268

Anticollision Report

05 December, 2018



Scientific Drilling

www.scientificdrilling.com

Company:	Devon Energy	Local Co-ordinate Reference:	Well 624H
Project:	Eddy County, NM (NAD83 NME)	TVD Reference:	KB = 32' @ 2892.00usft
Reference Site:	Spud Muffin 31-30	MD Reference:	KB = 32' @ 2892.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	624H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Midland District
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 9,999.99 usft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program	Date	12/5/2018
From (usft)	To (usft)	Survey (Wellbore)
0.00	19,831.98	Plan #1 (OH)
		Tool Name
		MWD+HDGM
		Description
		OWSG MWD + HDGM

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Spud Muffin 31-30						
332H (Leam) - OH - Planned	19,817.31	19,964.73	1,407.37	1,108.02	4.701	CC
332H (Leam) - OH - Planned	19,831.98	19,964.73	1,407.48	1,107.94	4.699	ES
332H (Leam) - OH - Planned	19,832.96	19,964.73	1,407.49	1,107.94	4.699	SF
334H - OH - Plan #1	2,500.00	2,500.00	30.01	12.56	1.720	CC, ES
334H - OH - Plan #1	2,600.00	2,599.54	30.77	12.64	1.697	SF
623H (Leam) - OH - Planned	12,950.09	13,041.35	1,489.22	1,376.42	13.203	CC
623H (Leam) - OH - Planned	19,832.96	19,943.33	1,540.79	1,242.73	5.169	ES, SF
738H - OH - Plan #1	9,389.97	9,379.44	145.09	79.53	2.213	CC
738H - OH - Plan #1	9,400.00	9,389.33	145.10	79.47	2.211	ES
738H - OH - Plan #1	9,450.00	9,438.07	145.65	79.71	2.209	SF

Offset Design Spud Muffin 31-30 - 332H (Leam) - OH - Planned													Offset Site Error: 0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-89.92	2.44	-1,765.11	1,765.14				
100.00	100.00	92.39	92.39	0.12	0.13	-89.93	2.29	-1,765.07	1,765.07	1,764.83	0.25	7,098.151	
200.00	200.00	194.04	194.03	0.48	0.47	-89.94	1.76	-1,764.84	1,764.94	1,763.99	0.95	1,848.288	
300.00	300.00	295.67	295.67	0.84	0.84	-89.97	0.86	-1,764.71	1,764.72	1,763.04	1.68	1,051.554	
400.00	400.00	397.30	397.28	1.20	1.20	-90.01	-0.41	-1,764.39	1,764.40	1,762.00	2.40	734.634	
500.00	500.00	498.91	498.89	1.56	1.57	-90.07	-2.05	-1,763.98	1,764.00	1,760.87	3.13	564.375	
600.00	600.00	600.52	600.47	1.91	1.94	-90.13	-4.07	-1,763.47	1,763.50	1,759.65	3.85	458.083	
700.00	700.00	702.10	702.02	2.27	2.30	-90.21	-6.46	-1,762.86	1,762.91	1,758.34	4.57	385.398	
800.00	800.00	803.66	803.54	2.63	2.67	-90.30	-9.22	-1,762.17	1,762.24	1,756.94	5.30	332.547	
900.00	900.00	905.21	905.03	2.99	3.04	-90.40	-12.35	-1,761.38	1,761.48	1,755.45	6.02	292.381	
1,000.00	1,000.00	1,006.72	1,006.49	3.35	3.40	-90.52	-15.85	-1,760.49	1,760.63	1,753.88	6.75	260.816	
1,100.00	1,100.00	1,108.21	1,107.89	3.71	3.77	-90.64	-19.73	-1,759.51	1,759.71	1,752.23	7.48	235.352	
1,200.00	1,200.00	1,209.66	1,209.25	4.07	4.14	-90.78	-23.97	-1,758.44	1,758.70	1,750.50	8.20	214.373	
1,300.00	1,300.00	1,311.08	1,310.56	4.42	4.51	-90.93	-28.58	-1,757.28	1,757.62	1,748.69	8.93	196.788	
1,400.00	1,400.00	1,412.47	1,411.82	4.78	4.88	-91.09	-33.56	-1,756.02	1,756.47	1,746.81	9.66	181.832	
1,500.00	1,500.00	1,513.81	1,513.01	5.14	5.25	-91.27	-38.91	-1,754.67	1,755.24	1,744.85	10.39	168.955	
1,600.00	1,600.00	1,615.11	1,614.14	5.50	5.62	-91.48	-44.83	-1,753.23	1,753.95	1,742.83	11.12	157.749	

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

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Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 332H (Leam) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
1,700.00	1,700.00	1,716.36	1,715.19	5.88	5.99	-91.66	-50.72	-1,751.69	1,752.59	1,740.74	11.85	147.909		
1,800.00	1,800.00	1,817.57	1,816.18	6.22	6.37	-91.87	-57.17	-1,750.06	1,751.18	1,738.60	12.58	139.198		
1,900.00	1,900.00	1,918.72	1,917.09	6.57	6.74	-92.10	-63.99	-1,748.34	1,749.71	1,736.39	13.31	131.431		
2,000.00	2,000.00	2,019.82	2,017.92	6.93	7.12	-92.33	-71.17	-1,746.53	1,748.18	1,734.14	14.05	124.462		
2,100.00	2,100.00	2,120.86	2,118.66	7.29	7.49	-92.58	-78.71	-1,744.62	1,746.62	1,731.84	14.78	118.174		
2,200.00	2,200.00	2,221.84	2,219.31	7.65	7.87	-92.85	-86.62	-1,742.63	1,745.01	1,729.49	15.52	112.471		
2,300.00	2,300.00	2,322.76	2,319.87	8.01	8.25	-93.12	-94.89	-1,740.54	1,743.36	1,727.11	16.25	107.275		
2,400.00	2,400.00	2,423.61	2,420.33	8.37	8.63	-93.41	-103.52	-1,738.36	1,741.69	1,724.70	16.99	102.520		
2,500.00	2,500.00	2,524.40	2,520.68	8.73	9.01	-93.71	-112.50	-1,736.09	1,739.99	1,722.26	17.73	98.154		
2,600.00	2,599.99	2,625.19	2,621.01	9.07	9.39	-96.03	-121.86	-1,733.73	1,738.20	1,719.76	18.45	94.219		
2,700.00	2,699.96	2,726.05	2,721.38	9.39	9.77	-95.81	-131.59	-1,731.27	1,736.27	1,717.12	19.15	90.643		
2,800.00	2,799.86	2,826.98	2,821.76	9.72	10.16	-95.63	-141.68	-1,728.72	1,734.17	1,714.31	19.87	87.296		
2,900.00	2,899.68	2,927.96	2,922.16	10.04	10.54	-95.51	-152.15	-1,726.08	1,731.89	1,711.31	20.58	84.154		
3,000.00	2,999.37	3,028.96	3,022.54	10.37	10.93	-95.43	-162.99	-1,723.34	1,729.42	1,708.12	21.30	81.198		
3,100.00	3,098.90	3,129.98	3,122.90	10.71	11.32	-95.40	-174.20	-1,720.51	1,726.75	1,704.72	22.02	78.409		
3,200.00	3,198.36	3,230.45	3,222.67	11.04	11.71	-95.36	-185.66	-1,717.62	1,723.95	1,701.21	22.75	75.782		
3,300.00	3,297.81	3,330.40	3,321.92	11.38	12.10	-95.31	-197.10	-1,714.73	1,721.16	1,697.68	23.48	73.311		
3,400.00	3,397.26	3,430.35	3,421.18	11.73	12.49	-95.27	-208.54	-1,711.84	1,718.38	1,694.15	24.21	70.979		
3,500.00	3,496.71	3,530.31	3,520.43	12.07	12.88	-95.23	-219.98	-1,708.95	1,715.56	1,690.82	24.94	68.775		
3,600.00	3,596.17	3,630.26	3,619.68	12.42	13.27	-95.19	-231.42	-1,706.07	1,712.76	1,687.08	25.68	66.689		
3,700.00	3,695.62	3,730.21	3,718.94	12.77	13.66	-95.15	-242.86	-1,703.18	1,709.97	1,683.54	26.42	64.714		
3,800.00	3,795.07	3,830.16	3,818.19	13.13	14.05	-95.11	-254.30	-1,700.29	1,707.17	1,680.01	27.17	62.841		
3,900.00	3,894.52	3,930.12	3,917.45	13.48	14.44	-95.07	-265.75	-1,697.40	1,704.38	1,676.47	27.91	61.063		
4,000.00	3,993.97	4,030.07	4,016.70	13.84	14.83	-95.02	-277.19	-1,694.51	1,701.59	1,672.93	28.66	59.372		
4,100.00	4,093.43	4,130.02	4,115.96	14.20	15.22	-94.98	-288.63	-1,691.62	1,698.80	1,669.39	29.41	57.765		
4,200.00	4,192.88	4,229.98	4,215.21	14.56	15.61	-94.94	-300.07	-1,688.73	1,696.00	1,665.84	30.16	56.233		
4,300.00	4,292.33	4,329.93	4,314.46	14.92	16.01	-94.90	-311.51	-1,685.84	1,693.21	1,662.30	30.91	54.774		
4,400.00	4,391.78	4,429.88	4,413.72	15.28	16.40	-94.85	-322.95	-1,682.96	1,690.43	1,658.76	31.67	53.381		
4,500.00	4,491.23	4,529.84	4,512.97	15.65	16.79	-94.81	-334.39	-1,680.07	1,687.64	1,655.21	32.42	52.050		
4,600.00	4,590.69	4,629.79	4,612.23	16.01	17.18	-94.77	-345.83	-1,677.18	1,684.85	1,651.67	33.18	50.779		
4,700.00	4,690.14	4,729.74	4,711.48	16.38	17.57	-94.72	-357.27	-1,674.29	1,682.06	1,648.13	33.94	49.562		
4,800.00	4,789.59	4,829.70	4,810.73	16.75	17.97	-94.68	-368.72	-1,671.40	1,679.28	1,644.58	34.70	48.397		
4,900.00	4,889.04	4,929.65	4,909.99	17.11	18.36	-94.64	-380.16	-1,668.51	1,676.49	1,641.04	35.46	47.280		
5,000.00	4,988.50	5,029.60	5,009.24	17.48	18.75	-94.59	-391.60	-1,665.62	1,673.71	1,637.49	36.22	46.209		
5,100.00	5,087.95	5,129.56	5,108.50	17.85	19.15	-94.55	-403.04	-1,662.73	1,670.93	1,633.95	36.98	45.181		
5,200.00	5,187.40	5,229.51	5,207.75	18.22	19.54	-94.51	-414.48	-1,659.85	1,668.15	1,630.40	37.75	44.193		
5,300.00	5,286.85	5,329.46	5,307.01	18.60	19.93	-94.48	-425.92	-1,656.96	1,665.37	1,626.86	38.51	43.244		
5,400.00	5,386.30	5,429.42	5,406.26	18.97	20.33	-94.42	-437.36	-1,654.07	1,662.59	1,623.31	39.28	42.331		
5,500.00	5,485.76	5,529.37	5,505.51	19.34	20.72	-94.38	-448.80	-1,651.18	1,659.81	1,619.77	40.04	41.452		
5,600.00	5,585.21	5,629.32	5,604.77	19.72	21.11	-94.33	-460.25	-1,648.29	1,657.03	1,616.22	40.81	40.605		
5,700.00	5,684.66	5,729.28	5,704.02	20.09	21.51	-94.29	-471.69	-1,645.40	1,654.26	1,612.68	41.58	39.789		
5,800.00	5,784.11	5,829.23	5,803.28	20.46	21.90	-94.24	-483.13	-1,642.51	1,651.48	1,609.14	42.34	39.002		
5,900.00	5,883.57	5,929.18	5,902.53	20.84	22.29	-94.20	-494.57	-1,639.63	1,648.71	1,605.59	43.11	38.242		
6,000.00	5,983.02	6,029.14	6,001.79	21.21	22.69	-94.15	-506.01	-1,636.74	1,645.93	1,602.05	43.88	37.509		
6,100.00	6,082.56	6,129.07	6,101.03	21.59	23.08	-94.05	-517.45	-1,633.85	1,643.25	1,598.60	44.65	36.804		
6,200.00	6,182.25	6,228.97	6,200.22	21.96	23.48	-93.99	-528.88	-1,630.96	1,640.75	1,595.34	45.41	36.131		
6,300.00	6,282.06	6,328.78	6,299.33	22.32	23.87	-93.67	-540.31	-1,628.08	1,638.46	1,592.29	46.17	35.489		
6,400.00	6,381.96	6,428.48	6,398.34	22.68	24.26	-93.39	-551.72	-1,625.20	1,636.38	1,589.46	46.92	34.876		
6,500.00	6,481.93	6,528.05	6,497.21	23.03	24.66	-93.05	-563.12	-1,622.32	1,634.55	1,586.88	47.67	34.291		
6,600.00	6,581.92	6,627.44	6,595.91	23.38	25.05	-92.34	-574.50	-1,619.45	1,632.99	1,584.58	48.40	33.738		
6,700.00	6,681.92	6,726.74	6,694.52	23.71	25.44	-92.75	-585.86	-1,616.58	1,631.81	1,582.49	49.13	33.211		
6,800.00	6,781.92	6,826.04	6,793.12	24.04	25.83	-98.16	-597.23	-1,613.71	1,630.33	1,580.47	49.86	32.701		

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Offset Design Spud Muffin 31-30 - 332H (Learn) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
6,900.00	6,881.92	6,925.35	6,891.73	24.38	26.22	-98.57	-608.59	-1,610.84	1,629.12	1,578.54	50.58	32.206		
7,000.00	6,981.92	7,024.65	6,990.33	24.72	26.62	-98.98	-619.96	-1,607.97	1,628.01	1,576.89	51.31	31.727		
7,100.00	7,081.92	7,123.95	7,088.94	25.05	27.01	-99.39	-631.33	-1,605.10	1,626.97	1,574.93	52.04	31.263		
7,200.00	7,181.92	7,223.25	7,187.55	25.39	27.40	-99.80	-642.69	-1,602.23	1,626.02	1,573.25	52.77	30.813		
7,300.00	7,281.92	7,322.55	7,286.15	25.73	27.79	-100.21	-654.06	-1,599.36	1,625.16	1,571.66	53.50	30.378		
7,400.00	7,381.92	7,421.85	7,384.76	26.07	28.18	-100.63	-665.43	-1,596.49	1,624.38	1,570.15	54.23	29.952		
7,500.00	7,481.92	7,521.15	7,483.37	26.41	28.58	-101.04	-676.79	-1,593.62	1,623.69	1,568.73	54.96	29.541		
7,600.00	7,581.92	7,619.25	7,580.85	26.75	28.96	-101.42	-687.36	-1,590.95	1,623.12	1,567.43	55.69	29.147		
7,700.00	7,681.92	7,717.54	7,678.71	27.08	29.34	-101.75	-696.34	-1,588.68	1,622.69	1,566.29	56.40	28.769		
7,800.00	7,781.92	7,816.13	7,777.00	27.43	29.71	-102.02	-703.71	-1,586.82	1,622.38	1,565.27	57.11	28.406		
7,900.00	7,881.92	7,914.95	7,875.65	27.77	30.07	-102.23	-709.44	-1,585.37	1,622.17	1,564.35	57.82	28.057		
8,000.00	7,981.92	8,013.94	7,974.55	28.11	30.42	-102.38	-713.53	-1,584.34	1,622.03	1,563.52	58.51	27.721		
8,100.00	8,081.92	8,113.06	8,073.63	28.45	30.77	-102.46	-715.97	-1,583.73	1,621.95	1,562.75	59.20	27.398		
8,200.00	8,181.92	8,212.25	8,172.82	28.79	31.09	-102.49	-716.75	-1,583.53	1,621.93	1,562.07	59.88	27.095		
8,300.00	8,281.92	8,312.25	8,272.82	29.13	31.39	-102.49	-716.75	-1,583.53	1,621.93	1,561.43	60.50	26.807		
8,400.00	8,381.92	8,412.25	8,372.82	29.48	31.69	-102.49	-716.75	-1,583.53	1,621.93	1,560.78	61.15	26.525		
8,500.00	8,481.92	8,512.25	8,472.82	29.82	31.99	-102.49	-716.75	-1,583.53	1,621.93	1,560.14	61.79	26.248		
8,600.00	8,581.92	8,612.25	8,572.82	30.16	32.29	-102.49	-716.75	-1,583.53	1,621.93	1,559.49	62.44	25.976		
8,700.00	8,681.92	8,712.25	8,672.82	30.51	32.60	-102.49	-716.75	-1,583.53	1,621.93	1,558.84	63.09	25.709		
8,800.00	8,781.92	8,812.25	8,772.82	30.85	32.90	-102.49	-716.75	-1,583.53	1,621.93	1,558.19	63.74	25.447		
8,900.00	8,881.92	8,912.25	8,872.82	31.20	33.21	-102.49	-716.75	-1,583.53	1,621.93	1,557.54	64.39	25.189		
9,000.00	8,981.92	9,012.25	8,972.82	31.54	33.52	-102.49	-716.75	-1,583.53	1,621.93	1,556.89	65.04	24.936		
9,100.00	9,081.92	9,112.91	9,073.48	31.89	33.83	-102.49	-716.75	-1,583.53	1,621.93	1,556.23	65.70	24.687		
9,200.00	9,181.92	9,355.12	9,308.44	32.23	34.44	-100.73	-665.87	-1,583.53	1,617.38	1,550.93	66.45	24.339		
9,297.08	9,279.00	9,528.27	9,453.13	32.57	34.73	-97.41	-571.96	-1,583.53	1,607.36	1,540.44	66.92	24.021		
9,300.00	9,281.92	9,532.46	9,456.25	32.58	34.73	-89.35	-569.16	-1,583.53	1,607.02	1,540.09	66.93	24.010		
9,350.00	9,331.85	9,599.15	9,503.05	32.75	34.81	-88.32	-521.70	-1,583.53	1,601.26	1,534.06	67.20	23.828		
9,400.00	9,381.37	9,657.99	9,539.52	32.91	34.88	-87.43	-475.56	-1,583.53	1,595.49	1,528.01	67.48	23.644		
9,450.00	9,430.11	9,710.91	9,568.13	33.06	34.93	-86.66	-431.07	-1,583.53	1,589.82	1,522.06	67.78	23.463		
9,500.00	9,477.71	9,759.29	9,590.59	33.21	34.98	-85.98	-388.23	-1,583.53	1,584.33	1,516.31	68.03	23.290		
9,550.00	9,523.79	9,804.15	9,608.12	33.35	35.02	-85.37	-346.95	-1,583.53	1,579.05	1,510.78	68.27	23.129		
9,600.00	9,568.01	9,846.25	9,621.59	33.48	35.06	-84.82	-307.07	-1,583.53	1,574.00	1,505.51	68.49	22.982		
9,650.00	9,610.02	9,886.14	9,631.61	33.60	35.10	-84.31	-268.47	-1,583.53	1,569.19	1,500.51	68.68	22.849		
9,700.00	9,649.52	9,924.25	9,638.66	33.72	35.14	-83.83	-231.03	-1,583.53	1,564.61	1,495.78	68.83	22.731		
9,750.00	9,686.20	9,960.91	9,643.08	33.83	35.18	-83.39	-194.64	-1,583.53	1,560.26	1,491.30	68.96	22.627		
9,800.00	9,719.78	9,996.37	9,645.13	33.94	35.22	-82.97	-159.24	-1,583.53	1,556.12	1,487.06	69.05	22.534		
9,850.00	9,750.01	10,035.14	9,645.65	34.05	35.27	-82.51	-120.47	-1,583.53	1,552.12	1,482.97	69.14	22.448		
9,900.00	9,776.65	10,077.33	9,646.15	34.16	35.32	-82.08	-78.29	-1,583.53	1,548.07	1,478.85	69.23	22.362		
9,950.00	9,799.50	10,121.62	9,646.66	34.27	35.40	-81.75	-34.01	-1,583.53	1,543.83	1,474.50	69.33	22.269		
10,000.00	9,818.40	10,167.66	9,647.20	34.39	35.49	-81.55	12.04	-1,583.53	1,539.24	1,469.79	69.45	22.164		
10,050.00	9,833.18	10,215.11	9,647.76	34.50	35.59	-81.52	59.48	-1,583.53	1,534.20	1,464.61	69.59	22.045		
10,100.00	9,843.75	10,263.61	9,648.32	34.62	35.71	-81.68	107.98	-1,583.53	1,528.84	1,458.86	69.78	21.907		
10,150.00	9,850.02	10,312.79	9,648.90	34.74	35.85	-82.05	157.15	-1,583.53	1,522.49	1,452.50	70.00	21.751		
10,194.18	9,851.95	10,356.50	9,649.41	34.85	35.98	-82.56	200.87	-1,583.53	1,516.58	1,446.35	70.23	21.595		
10,200.00	9,851.98	10,362.27	9,649.48	34.87	36.00	-82.56	206.63	-1,583.53	1,515.77	1,445.51	70.26	21.573		
10,214.18	9,852.05	10,376.31	9,649.64	34.91	36.04	-82.55	220.67	-1,583.53	1,513.80	1,443.46	70.34	21.521		
10,300.00	9,852.49	10,461.48	9,650.64	35.16	36.35	-82.56	305.81	-1,583.53	1,503.15	1,432.27	70.88	21.207		
10,400.00	9,852.99	10,561.03	9,651.80	35.50	36.75	-82.57	405.37	-1,583.53	1,493.93	1,422.32	71.61	20.862		
10,500.00	9,853.50	10,660.86	9,652.97	35.89	37.20	-82.59	505.20	-1,583.53	1,488.17	1,415.72	72.45	20.541		
10,589.17	9,853.95	10,750.00	9,654.01	36.28	37.65	-82.62	594.33	-1,583.53	1,485.95	1,412.67	73.28	20.278		
10,600.00	9,854.01	10,760.82	9,654.14	36.33	37.71	-82.62	605.16	-1,583.53	1,485.84	1,412.46	73.38	20.247		
10,700.00	9,854.51	10,860.82	9,655.31	36.81	38.26	-82.64	705.14	-1,583.53	1,484.89	1,410.47	74.42	19.953		

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 332H (Leam) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
10,800.00	9,855.02	10,960.81	9,856.48	37.35	38.87	-82.66	805.13	-1,583.53	1,483.94	1,408.39	75.55	19.841		
10,900.00	9,855.53	11,060.81	9,857.65	37.93	39.51	-82.68	905.12	-1,583.53	1,482.99	1,406.22	76.78	19.316		
11,000.00	9,856.03	11,160.80	9,858.81	38.56	40.20	-82.70	1,005.11	-1,583.53	1,482.04	1,403.95	78.09	18.978		
11,100.00	9,856.54	11,260.79	9,859.98	39.23	40.93	-82.73	1,105.09	-1,583.53	1,481.09	1,401.60	79.49	18.633		
11,200.00	9,857.04	11,360.79	9,861.15	39.94	41.70	-82.75	1,205.08	-1,583.53	1,480.14	1,399.18	80.97	18.281		
11,300.00	9,857.55	11,460.78	9,862.32	40.70	42.50	-82.77	1,305.07	-1,583.53	1,479.19	1,396.68	82.52	17.926		
11,400.00	9,858.06	11,560.78	9,863.49	41.49	43.34	-82.79	1,405.05	-1,583.53	1,478.25	1,394.10	84.14	17.568		
11,500.00	9,858.56	11,660.77	9,864.66	42.32	44.21	-82.81	1,505.04	-1,583.53	1,477.30	1,391.46	85.83	17.211		
11,600.00	9,859.07	11,760.76	9,865.83	43.18	45.11	-82.83	1,605.03	-1,583.53	1,476.35	1,388.76	87.59	16.855		
11,700.00	9,859.58	11,860.76	9,867.00	44.07	46.04	-82.85	1,705.02	-1,583.53	1,475.40	1,386.00	89.40	16.503		
11,800.00	9,860.08	11,960.75	9,868.17	44.99	46.99	-82.87	1,805.00	-1,583.53	1,474.45	1,383.18	91.28	16.154		
11,900.00	9,860.59	12,060.75	9,869.34	45.94	47.97	-82.90	1,904.99	-1,583.53	1,473.50	1,380.30	93.20	15.810		
12,000.00	9,861.09	12,160.74	9,870.51	46.92	48.97	-82.92	2,004.98	-1,583.53	1,472.56	1,377.38	95.17	15.472		
12,100.00	9,861.60	12,260.73	9,871.68	47.92	50.00	-82.94	2,104.96	-1,583.53	1,471.61	1,374.42	97.19	15.141		
12,200.00	9,862.11	12,360.73	9,872.85	48.94	51.04	-82.96	2,204.95	-1,583.53	1,470.66	1,371.40	99.26	14.817		
12,300.00	9,862.61	12,460.72	9,874.02	49.99	52.11	-82.98	2,304.94	-1,583.53	1,469.71	1,368.35	101.36	14.500		
12,400.00	9,863.12	12,560.72	9,875.18	51.05	53.19	-83.00	2,404.93	-1,583.53	1,468.77	1,365.26	103.50	14.190		
12,500.00	9,863.62	12,660.71	9,876.35	52.14	54.29	-83.02	2,504.91	-1,583.53	1,467.82	1,362.13	105.68	13.889		
12,600.00	9,864.13	12,760.70	9,877.52	53.24	55.41	-83.05	2,604.90	-1,583.53	1,466.87	1,358.97	107.90	13.595		
12,700.00	9,864.64	12,860.70	9,878.69	54.38	56.54	-83.07	2,704.89	-1,583.53	1,465.93	1,355.78	110.14	13.309		
12,800.00	9,865.14	12,960.69	9,879.86	55.49	57.69	-83.09	2,804.87	-1,583.53	1,464.98	1,352.56	112.42	13.031		
12,900.00	9,865.65	13,060.69	9,881.03	56.64	58.85	-83.11	2,904.86	-1,583.53	1,464.03	1,349.31	114.73	12.761		
13,000.00	9,866.15	13,160.68	9,882.20	57.81	60.02	-83.13	3,004.85	-1,583.53	1,463.09	1,346.03	117.06	12.499		
13,100.00	9,866.66	13,260.67	9,883.37	58.99	61.21	-83.15	3,104.84	-1,583.53	1,462.14	1,342.73	119.41	12.244		
13,200.00	9,867.17	13,360.67	9,884.54	60.17	62.41	-83.18	3,204.82	-1,583.53	1,461.20	1,339.40	121.79	11.997		
13,300.00	9,867.67	13,460.66	9,885.71	61.38	63.61	-83.20	3,304.81	-1,583.53	1,460.25	1,336.06	124.20	11.758		
13,400.00	9,868.18	13,560.66	9,886.88	62.59	64.83	-83.22	3,404.80	-1,583.53	1,459.31	1,332.69	126.62	11.525		
13,500.00	9,868.69	13,660.65	9,888.05	63.81	66.06	-83.24	3,504.78	-1,583.53	1,458.36	1,329.30	129.08	11.300		
13,600.00	9,869.19	13,760.64	9,889.22	65.04	67.30	-83.26	3,604.77	-1,583.53	1,457.42	1,325.89	131.53	11.081		
13,700.00	9,869.70	13,860.64	9,890.39	66.28	68.54	-83.29	3,704.76	-1,583.53	1,456.47	1,322.47	134.01	10.869		
13,800.00	9,870.20	13,960.63	9,891.55	67.53	69.79	-83.31	3,804.75	-1,583.53	1,455.53	1,319.03	136.50	10.663		
13,900.00	9,870.71	14,060.63	9,892.72	68.79	71.05	-83.33	3,904.73	-1,583.53	1,454.59	1,315.57	139.02	10.463		
14,000.00	9,871.22	14,160.62	9,893.89	70.06	72.32	-83.35	4,004.72	-1,583.53	1,453.64	1,312.10	141.54	10.270		
14,100.00	9,871.72	14,260.61	9,895.06	71.33	73.60	-83.37	4,104.71	-1,583.53	1,452.70	1,308.61	144.09	10.082		
14,200.00	9,872.23	14,360.61	9,896.23	72.61	74.88	-83.40	4,204.69	-1,583.53	1,451.76	1,305.11	146.64	9.900		
14,300.00	9,872.73	14,460.60	9,897.40	73.90	76.17	-83.42	4,304.68	-1,583.53	1,450.81	1,301.60	149.21	9.723		
14,400.00	9,873.24	14,560.60	9,898.57	75.19	77.46	-83.44	4,404.67	-1,583.53	1,449.87	1,298.08	151.79	9.552		
14,500.00	9,873.75	14,660.59	9,899.74	76.49	78.76	-83.46	4,504.66	-1,583.53	1,448.93	1,294.54	154.38	9.385		
14,600.00	9,874.25	14,760.58	9,900.91	77.80	80.06	-83.48	4,604.64	-1,583.53	1,447.99	1,291.00	156.99	9.224		
14,700.00	9,874.76	14,860.58	9,902.08	79.11	81.37	-83.51	4,704.63	-1,583.53	1,447.04	1,287.44	159.60	9.067		
14,800.00	9,875.27	14,960.57	9,903.25	80.43	82.69	-83.53	4,804.62	-1,583.53	1,446.10	1,283.87	162.23	8.914		
14,900.00	9,875.77	15,060.57	9,904.42	81.75	84.01	-83.55	4,904.60	-1,583.53	1,445.16	1,280.30	164.86	8.766		
15,000.00	9,876.28	15,160.56	9,905.59	83.07	85.33	-83.57	5,004.59	-1,583.53	1,444.22	1,276.71	167.50	8.622		
15,100.00	9,876.78	15,260.55	9,906.75	84.40	86.66	-83.59	5,104.58	-1,583.53	1,443.28	1,273.12	170.15	8.482		
15,200.00	9,877.29	15,360.55	9,907.92	85.73	87.99	-83.62	5,204.57	-1,583.53	1,442.34	1,269.52	172.81	8.346		
15,300.00	9,877.80	15,460.54	9,909.09	87.07	89.32	-83.64	5,304.55	-1,583.53	1,441.39	1,265.91	175.48	8.214		
15,400.00	9,878.30	15,560.54	9,910.26	88.41	90.66	-83.66	5,404.54	-1,583.53	1,440.45	1,262.30	178.16	8.085		
15,500.00	9,878.81	15,660.53	9,911.43	89.76	92.01	-83.68	5,504.53	-1,583.53	1,439.51	1,258.67	180.84	7.960		
15,600.00	9,879.31	15,757.93	9,911.85	91.11	93.32	-83.68	5,601.93	-1,583.53	1,438.68	1,255.16	183.49	7.840		
15,700.00	9,879.82	15,857.92	9,911.38	92.46	94.67	-83.64	5,701.92	-1,583.53	1,437.90	1,251.73	186.17	7.724		
15,800.00	9,880.33	15,957.91	9,910.91	93.82	96.02	-83.59	5,801.91	-1,583.53	1,437.14	1,248.28	188.85	7.610		
15,900.00	9,880.83	16,057.91	9,910.44	95.17	97.37	-83.55	5,901.90	-1,583.53	1,436.38	1,244.84	191.54	7.499		

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

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Well Error: 0.00 usft
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Local Co-ordinate Reference: Well 624H
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Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
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Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 332H (Leam) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
16,000.00	9,881.34	16,157.90	9,709.96	96.54	98.73	-83.51	6,001.89	-1,583.53	1,435.62	1,241.38	194.24	7.391		
16,100.00	9,881.85	16,257.89	9,709.49	97.90	100.09	-83.48	6,101.88	-1,583.53	1,434.87	1,237.93	196.94	7.288		
16,200.00	9,882.35	16,357.88	9,709.02	99.27	101.45	-83.42	6,201.87	-1,583.53	1,434.11	1,234.47	199.84	7.183		
16,300.00	9,882.86	16,457.87	9,708.55	100.64	102.82	-83.38	6,301.86	-1,583.53	1,433.36	1,231.00	202.35	7.083		
16,400.00	9,883.36	16,557.86	9,708.08	102.01	104.19	-83.34	6,401.85	-1,583.53	1,432.60	1,227.53	205.07	6.986		
16,500.00	9,883.87	16,657.85	9,707.61	103.38	105.56	-83.29	6,501.84	-1,583.53	1,431.85	1,224.06	207.79	6.891		
16,600.00	9,884.38	16,757.85	9,707.14	104.76	106.93	-83.25	6,601.83	-1,583.53	1,431.10	1,220.59	210.51	6.798		
16,700.00	9,884.88	16,857.84	9,706.67	106.14	108.30	-83.21	6,701.82	-1,583.53	1,430.35	1,217.11	213.24	6.708		
16,800.00	9,885.39	16,957.83	9,706.20	107.52	109.68	-83.16	6,801.81	-1,583.53	1,429.60	1,213.63	215.97	6.620		
16,900.00	9,885.89	17,057.82	9,705.72	108.90	111.06	-83.12	6,901.80	-1,583.53	1,428.85	1,210.15	218.70	6.533		
17,000.00	9,886.40	17,157.81	9,705.25	110.29	112.44	-83.08	7,001.79	-1,583.53	1,428.10	1,206.68	221.44	6.449		
17,100.00	9,886.91	17,257.80	9,704.78	111.68	113.82	-83.03	7,101.78	-1,583.53	1,427.35	1,203.17	224.18	6.367		
17,200.00	9,887.41	17,357.79	9,704.31	113.06	115.21	-82.99	7,201.77	-1,583.53	1,426.60	1,199.68	226.92	6.287		
17,300.00	9,887.92	17,457.78	9,703.84	114.46	116.59	-82.95	7,301.76	-1,583.53	1,425.85	1,196.19	229.67	6.208		
17,400.00	9,888.43	17,557.77	9,703.37	115.85	117.98	-82.91	7,401.75	-1,583.53	1,425.11	1,192.69	232.42	6.132		
17,500.00	9,888.93	17,657.77	9,702.90	117.24	119.37	-82.86	7,501.74	-1,583.53	1,424.36	1,189.19	235.17	6.057		
17,600.00	9,889.44	17,757.76	9,702.43	118.64	120.76	-82.82	7,601.73	-1,583.53	1,423.62	1,185.70	237.92	5.983		
17,700.00	9,889.94	17,857.75	9,701.95	120.03	122.15	-82.77	7,701.72	-1,583.53	1,422.88	1,182.20	240.68	5.912		
17,800.00	9,890.45	17,957.74	9,701.48	121.43	123.55	-82.73	7,801.71	-1,583.53	1,422.13	1,178.69	243.44	5.842		
17,900.00	9,890.96	18,057.73	9,701.01	122.83	124.94	-82.69	7,901.70	-1,583.53	1,421.39	1,175.19	246.20	5.773		
18,000.00	9,891.46	18,157.72	9,700.54	124.23	126.34	-82.64	8,001.69	-1,583.53	1,420.65	1,171.68	248.97	5.706		
18,100.00	9,891.97	18,257.72	9,700.07	125.64	127.74	-82.60	8,101.68	-1,583.53	1,419.91	1,168.18	251.73	5.641		
18,200.00	9,892.47	18,357.71	9,699.60	127.04	129.14	-82.56	8,201.67	-1,583.53	1,419.17	1,164.67	254.50	5.576		
18,300.00	9,892.98	18,457.70	9,699.13	128.44	130.54	-82.51	8,301.66	-1,583.53	1,418.43	1,161.16	257.27	5.513		
18,400.00	9,893.49	18,557.69	9,698.66	129.85	131.94	-82.47	8,401.65	-1,583.53	1,417.70	1,157.65	260.04	5.452		
18,500.00	9,893.99	18,657.68	9,698.18	131.26	133.34	-82.43	8,501.64	-1,583.53	1,416.96	1,154.14	262.82	5.391		
18,600.00	9,894.50	18,757.67	9,697.71	132.67	134.74	-82.38	8,601.63	-1,583.53	1,416.22	1,150.63	265.59	5.332		
18,700.00	9,895.01	18,857.66	9,697.24	134.08	136.15	-82.34	8,701.63	-1,583.53	1,415.49	1,147.12	268.37	5.274		
18,800.00	9,895.51	18,957.66	9,696.77	135.49	137.55	-82.29	8,801.62	-1,583.53	1,414.76	1,143.61	271.15	5.218		
18,900.00	9,896.02	19,057.65	9,696.30	136.90	138.96	-82.25	8,901.61	-1,583.53	1,414.02	1,140.09	273.93	5.162		
19,000.00	9,896.52	19,157.64	9,695.83	138.31	140.37	-82.21	9,001.60	-1,583.53	1,413.29	1,136.58	276.71	5.107		
19,100.00	9,897.03	19,257.63	9,695.36	139.73	141.78	-82.16	9,101.59	-1,583.53	1,412.56	1,133.07	279.49	5.054		
19,200.00	9,897.54	19,357.62	9,694.89	141.14	143.19	-82.12	9,201.58	-1,583.53	1,411.83	1,129.55	282.28	5.002		
19,300.00	9,898.04	19,457.61	9,694.42	142.56	144.60	-82.07	9,301.57	-1,583.53	1,411.10	1,126.04	285.06	4.950		
19,400.00	9,898.55	19,557.60	9,693.94	143.97	146.01	-82.03	9,401.56	-1,583.53	1,410.37	1,122.52	287.85	4.900		
19,500.00	9,899.05	19,657.60	9,693.47	145.39	147.42	-81.99	9,501.55	-1,583.53	1,409.64	1,119.00	290.64	4.850		
19,600.00	9,899.56	19,757.59	9,693.00	146.81	148.84	-81.94	9,601.54	-1,583.53	1,408.91	1,115.49	293.42	4.802		
19,700.00	9,900.07	19,857.58	9,692.53	148.23	150.25	-81.90	9,701.53	-1,583.53	1,408.19	1,111.97	296.21	4.754		
19,800.00	9,900.57	19,957.57	9,692.06	149.65	151.66	-81.85	9,801.52	-1,583.53	1,407.46	1,108.46	299.00	4.707		
19,817.31	9,900.66	19,964.73	9,692.03	149.89	151.77	-81.85	9,808.68	-1,583.53	1,407.37	1,108.02	299.35	4.701 CC		
19,831.88	9,901.00	19,964.73	9,692.03	150.10	151.77	-81.84	9,808.68	-1,583.53	1,407.48	1,107.94	299.54	4.699 ES		
19,832.96	9,901.01	19,964.73	9,692.03	150.11	151.77	-81.84	9,808.68	-1,583.53	1,407.49	1,107.94	299.55	4.699 SF		

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 334H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-89.60	0.21	-30.01	30.01					
100.00	100.00	100.00	100.00	0.12	0.12	-89.60	0.21	-30.01	30.01	29.77	0.24	123.125		
200.00	200.00	200.00	200.00	0.48	0.48	-89.60	0.21	-30.01	30.01	29.05	0.96	31.241		
300.00	300.00	300.00	300.00	0.84	0.84	-89.60	0.21	-30.01	30.01	28.34	1.68	17.890		
400.00	400.00	400.00	400.00	1.20	1.20	-89.60	0.21	-30.01	30.01	27.62	2.39	12.534		
500.00	500.00	500.00	500.00	1.56	1.56	-89.60	0.21	-30.01	30.01	26.90	3.11	9.646		
600.00	600.00	600.00	600.00	1.91	1.91	-89.60	0.21	-30.01	30.01	26.18	3.83	7.839		
700.00	700.00	700.00	700.00	2.27	2.27	-89.60	0.21	-30.01	30.01	25.47	4.55	6.603		
800.00	800.00	800.00	800.00	2.63	2.63	-89.60	0.21	-30.01	30.01	24.75	5.26	5.703		
900.00	900.00	900.00	900.00	2.99	2.99	-89.60	0.21	-30.01	30.01	24.03	5.98	5.020		
1,000.00	1,000.00	1,000.00	1,000.00	3.35	3.35	-89.60	0.21	-30.01	30.01	23.32	6.70	4.482		
1,100.00	1,100.00	1,100.00	1,100.00	3.71	3.71	-89.60	0.21	-30.01	30.01	22.60	7.41	4.049		
1,200.00	1,200.00	1,200.00	1,200.00	4.07	4.07	-89.60	0.21	-30.01	30.01	21.88	8.13	3.692		
1,300.00	1,300.00	1,300.00	1,300.00	4.42	4.42	-89.60	0.21	-30.01	30.01	21.17	8.85	3.392		
1,400.00	1,400.00	1,400.00	1,400.00	4.78	4.78	-89.60	0.21	-30.01	30.01	20.45	9.56	3.138		
1,500.00	1,500.00	1,500.00	1,500.00	5.14	5.14	-89.60	0.21	-30.01	30.01	19.73	10.28	2.919		
1,600.00	1,600.00	1,600.00	1,600.00	5.50	5.50	-89.60	0.21	-30.01	30.01	19.02	11.00	2.729		
1,700.00	1,700.00	1,700.00	1,700.00	5.86	5.86	-89.60	0.21	-30.01	30.01	18.30	11.71	2.562		
1,800.00	1,800.00	1,800.00	1,800.00	6.22	6.22	-89.60	0.21	-30.01	30.01	17.58	12.43	2.414		
1,900.00	1,900.00	1,900.00	1,900.00	6.57	6.57	-89.60	0.21	-30.01	30.01	16.86	13.15	2.283		
2,000.00	2,000.00	2,000.00	2,000.00	6.93	6.93	-89.60	0.21	-30.01	30.01	16.15	13.87	2.165		
2,100.00	2,100.00	2,100.00	2,100.00	7.29	7.29	-89.60	0.21	-30.01	30.01	15.43	14.58	2.058		
2,200.00	2,200.00	2,200.00	2,200.00	7.65	7.65	-89.60	0.21	-30.01	30.01	14.71	15.30	1.962		
2,300.00	2,300.00	2,300.00	2,300.00	8.01	8.01	-89.60	0.21	-30.01	30.01	14.00	16.02	1.874		
2,400.00	2,400.00	2,400.00	2,400.00	8.37	8.37	-89.60	0.21	-30.01	30.01	13.28	16.73	1.794		
2,500.00	2,500.00	2,500.00	2,500.00	8.73	8.73	-89.60	0.21	-30.01	30.01	12.56	17.45	1.720 CC, ES		
2,600.00	2,599.99	2,599.54	2,599.54	9.07	9.07	91.20	-0.22	-30.76	30.77	12.64	18.13	1.697 SF		
2,700.00	2,699.96	2,699.04	2,699.00	9.39	9.40	93.38	-1.52	-33.01	33.08	14.30	18.78	1.761		
2,800.00	2,799.86	2,798.45	2,798.31	9.72	9.73	96.35	-3.68	-36.74	37.01	17.58	19.43	1.905		
2,900.00	2,899.68	2,897.72	2,897.40	10.04	10.07	99.59	-6.69	-41.96	42.65	22.57	20.08	2.124		
3,000.00	2,999.37	2,996.81	2,996.19	10.37	10.41	102.66	-10.55	-48.65	50.04	29.31	20.73	2.413		
3,100.00	3,098.90	3,095.68	3,094.61	10.71	10.75	105.35	-15.26	-56.81	59.21	37.82	21.39	2.768		
3,200.00	3,198.36	3,194.33	3,192.83	11.04	11.09	107.02	-20.80	-66.40	69.89	47.84	22.05	3.170		
3,300.00	3,297.81	3,292.75	3,290.22	11.38	11.43	107.35	-27.17	-77.43	81.76	59.05	22.71	3.601		
3,400.00	3,397.26	3,390.87	3,387.29	11.73	11.78	106.84	-34.35	-89.87	94.78	71.41	23.36	4.057		
3,500.00	3,496.71	3,488.65	3,483.75	12.07	12.13	105.80	-42.33	-103.70	108.97	84.95	24.02	4.537		
3,600.00	3,596.17	3,587.35	3,580.95	12.42	12.50	104.65	-50.90	-118.53	123.91	99.21	24.70	5.016		
3,700.00	3,695.62	3,686.20	3,678.30	12.77	12.86	103.74	-59.48	-133.40	138.90	113.50	25.40	5.469		
3,800.00	3,795.07	3,785.05	3,775.65	13.13	13.23	103.01	-68.06	-148.26	153.92	127.82	26.10	5.898		
3,900.00	3,894.52	3,883.90	3,872.99	13.48	13.61	102.41	-76.64	-163.13	168.96	142.15	26.80	6.303		
4,000.00	3,993.97	3,982.74	3,970.34	13.84	13.98	101.91	-85.23	-177.99	184.01	156.49	27.52	6.687		
4,100.00	4,093.43	4,081.59	4,067.69	14.20	14.36	101.49	-93.81	-192.86	199.07	170.84	28.23	7.052		
4,200.00	4,192.88	4,180.44	4,165.04	14.56	14.75	101.12	-102.39	-207.72	214.15	185.20	28.95	7.397		
4,300.00	4,292.33	4,279.29	4,262.38	14.92	15.13	100.80	-110.97	-222.59	229.23	199.55	29.67	7.726		
4,400.00	4,391.78	4,378.14	4,359.73	15.28	15.52	100.52	-119.56	-237.45	244.31	213.92	30.40	8.038		
4,500.00	4,491.23	4,476.99	4,457.08	15.65	15.91	100.28	-128.14	-252.32	259.40	228.28	31.12	8.334		
4,600.00	4,590.69	4,575.84	4,554.42	16.01	16.30	100.06	-136.72	-267.18	274.50	242.65	31.85	8.617		
4,700.00	4,690.14	4,674.69	4,651.77	16.38	16.70	99.86	-145.30	-282.05	289.60	257.01	32.59	8.887		
4,800.00	4,789.59	4,773.54	4,749.12	16.75	17.09	99.68	-153.89	-296.91	304.70	271.38	33.32	9.144		
4,900.00	4,889.04	4,872.38	4,846.47	17.11	17.49	99.52	-162.47	-311.78	319.81	285.75	34.06	9.389		
5,000.00	4,988.50	4,971.23	4,943.81	17.48	17.89	99.38	-171.05	-326.65	334.91	300.11	34.80	9.624		
5,100.00	5,087.95	5,070.08	5,041.16	17.85	18.29	99.24	-179.63	-341.51	350.02	314.48	35.54	9.848		

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 334H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.00	5,187.40	5,168.93	5,138.51	18.22	18.69	99.12	-188.22	-356.38	365.13	328.85	36.29	10.063	
5,300.00	5,288.85	5,267.78	5,235.85	18.60	19.09	99.01	-196.80	-371.24	380.25	343.22	37.03	10.268	
5,400.00	5,388.30	5,368.63	5,333.20	18.97	19.50	98.91	-205.38	-386.11	395.36	357.58	37.78	10.466	
5,500.00	5,485.76	5,465.48	5,430.55	19.34	19.90	98.81	-213.96	-400.97	410.48	371.95	38.53	10.655	
5,600.00	5,585.21	5,564.33	5,527.89	19.72	20.31	98.72	-222.55	-415.84	425.59	386.32	39.27	10.836	
5,700.00	5,684.66	5,663.17	5,625.24	20.09	20.72	98.64	-231.13	-430.70	440.71	400.68	40.03	11.011	
5,800.00	5,784.11	5,762.02	5,722.59	20.46	21.13	98.56	-239.71	-445.57	455.83	415.05	40.78	11.178	
5,900.00	5,883.57	5,860.87	5,819.94	20.84	21.54	98.49	-248.29	-460.43	470.94	429.41	41.53	11.340	
6,000.00	5,983.02	5,959.72	5,917.28	21.21	21.95	98.42	-256.88	-475.30	486.06	443.78	42.28	11.495	
6,100.00	6,082.56	6,058.58	6,014.64	21.59	22.36	98.41	-265.46	-490.16	501.06	458.02	43.04	11.643	
6,200.00	6,182.25	6,157.44	6,112.00	21.96	22.77	98.20	-274.04	-505.03	515.81	472.03	43.78	11.782	
6,300.00	6,282.06	6,256.26	6,209.32	22.32	23.18	97.83	-282.62	-519.89	530.35	485.84	44.51	11.915	
6,400.00	6,381.96	6,355.03	6,306.58	22.68	23.59	97.30	-291.20	-534.75	544.71	499.47	45.24	12.041	
6,500.00	6,481.93	6,453.70	6,403.76	23.03	24.01	96.63	-299.76	-549.58	558.94	512.99	45.95	12.163	
6,600.00	6,581.92	6,556.89	6,505.43	23.38	24.44	-84.21	-308.58	-564.86	572.89	526.19	46.70	12.266	
6,700.00	6,681.92	6,664.81	6,611.85	23.71	24.88	-85.17	-316.91	-579.28	585.56	538.07	47.49	12.330	
6,800.00	6,781.92	6,772.93	6,719.16	24.04	25.31	-85.98	-324.27	-592.03	596.80	548.54	48.27	12.384	
6,900.00	6,881.92	6,881.77	6,827.26	24.38	25.74	-86.65	-330.65	-603.07	606.57	557.54	49.04	12.370	
7,000.00	6,981.92	6,991.07	6,936.02	24.72	26.15	-87.21	-338.01	-612.37	614.81	565.02	49.79	12.347	
7,100.00	7,081.92	7,100.74	7,045.34	25.05	26.56	-87.64	-340.35	-619.89	621.49	570.95	50.54	12.297	
7,200.00	7,181.92	7,210.70	7,155.10	25.39	26.96	-87.96	-343.66	-625.61	626.58	575.30	51.27	12.221	
7,300.00	7,281.92	7,320.87	7,265.18	25.73	27.35	-88.18	-345.91	-629.51	630.05	578.05	51.99	12.118	
7,400.00	7,381.92	7,431.18	7,375.46	26.07	27.72	-88.29	-347.10	-631.57	631.89	579.19	52.69	11.992	
7,500.00	7,481.92	7,537.64	7,481.92	26.41	28.07	-88.31	-347.31	-631.93	632.20	578.83	53.37	11.845	
7,600.00	7,581.92	7,637.84	7,581.92	26.75	28.40	-88.31	-347.31	-631.93	632.20	578.16	54.05	11.697	
7,700.00	7,681.92	7,737.84	7,681.92	27.08	28.72	-88.31	-347.31	-631.93	632.20	577.48	54.72	11.553	
7,800.00	7,781.92	7,837.84	7,781.92	27.43	29.05	-88.31	-347.31	-631.93	632.20	576.81	55.39	11.413	
7,900.00	7,881.92	7,937.84	7,881.92	27.77	29.37	-88.31	-347.31	-631.93	632.20	576.13	56.07	11.275	
8,000.00	7,981.92	8,037.84	7,981.92	28.11	29.70	-88.31	-347.31	-631.93	632.20	575.46	56.75	11.141	
8,100.00	8,081.92	8,137.84	8,081.92	28.45	30.03	-88.31	-347.31	-631.93	632.20	574.78	57.42	11.009	
8,200.00	8,181.92	8,237.84	8,181.92	28.79	30.35	-88.31	-347.31	-631.93	632.20	574.10	58.10	10.881	
8,300.00	8,281.92	8,337.84	8,281.92	29.13	30.68	-88.31	-347.31	-631.93	632.20	573.42	58.78	10.755	
8,400.00	8,381.92	8,437.84	8,381.92	29.48	31.01	-88.31	-347.31	-631.93	632.20	572.74	59.46	10.632	
8,500.00	8,481.92	8,537.84	8,481.92	29.82	31.34	-88.31	-347.31	-631.93	632.20	572.06	60.15	10.511	
8,600.00	8,581.92	8,637.84	8,581.92	30.16	31.67	-88.31	-347.31	-631.93	632.20	571.38	60.83	10.393	
8,700.00	8,681.92	8,737.84	8,681.92	30.51	32.00	-88.31	-347.31	-631.93	632.20	570.69	61.51	10.276	
8,800.00	8,781.92	8,837.84	8,781.92	30.85	32.34	-88.31	-347.31	-631.93	632.20	570.01	62.19	10.165	
8,900.00	8,881.92	8,937.84	8,881.92	31.20	32.67	-88.31	-347.31	-631.93	632.20	569.33	62.88	10.054	
9,000.00	8,981.92	9,037.84	8,981.92	31.54	33.00	-88.31	-347.31	-631.93	632.20	568.64	63.56	9.946	
9,100.00	9,081.92	9,137.84	9,081.92	31.89	33.34	-88.31	-347.31	-631.93	632.20	567.95	64.25	9.840	
9,100.65	9,082.58	9,138.29	9,082.58	31.89	33.34	-88.31	-347.31	-631.93	632.20	567.95	64.25	9.839	
9,200.00	9,181.92	9,234.01	9,178.17	32.23	33.65	-88.01	-343.92	-632.00	632.39	567.46	64.93	9.739	
9,297.08	9,279.00	9,322.76	9,265.30	32.57	33.92	-86.53	-327.52	-632.32	633.63	568.04	65.59	9.661	
9,300.00	9,281.92	9,325.35	9,267.80	32.58	33.93	-78.46	-326.84	-632.33	633.69	568.09	65.60	9.659	
9,350.00	9,331.85	9,369.12	9,309.53	32.75	34.05	-77.36	-313.64	-632.59	634.60	568.69	65.92	9.627	
9,400.00	9,381.37	9,412.17	9,349.46	32.91	34.16	-76.35	-297.60	-632.90	635.19	568.89	66.20	9.595	
9,450.00	9,430.11	9,454.55	9,387.49	33.06	34.26	-75.44	-278.92	-633.27	635.42	568.98	66.44	9.564	
9,500.00	9,477.71	9,500.00	9,426.62	33.21	34.35	-74.54	-255.82	-633.72	635.27	568.60	66.67	9.529	
9,550.00	9,523.78	9,537.57	9,457.49	33.35	34.42	-73.88	-234.44	-634.14	634.69	567.88	66.80	9.501	
9,600.00	9,568.01	9,578.32	9,489.32	33.48	34.49	-73.25	-209.01	-634.63	633.69	566.76	66.93	9.469	
9,650.00	9,610.02	9,618.64	9,518.96	33.60	34.54	-72.72	-181.70	-635.17	632.23	565.23	67.01	9.435	
9,700.00	9,649.52	9,658.57	9,546.35	33.72	34.59	-72.29	-152.65	-635.74	630.31	563.26	67.06	9.399	

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 334H - OH - Plan #1													Offset Site Error:
Survey Program: 0-MWD+HDGM													Offset Well Error:
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
9,750.00	9,886.20	9,700.00	9,572.55	33.83	34.63	-71.93	-120.58	-636.36	627.92	560.82	67.10	9.358	
9,800.00	9,719.78	9,737.47	9,594.20	33.94	34.66	-71.73	-90.00	-636.96	625.04	557.96	67.09	9.317	
9,850.00	9,750.01	9,776.54	9,614.59	34.05	34.68	-71.60	-56.70	-637.61	621.68	554.60	67.08	9.267	
9,900.00	9,776.65	9,815.40	9,632.58	34.16	34.69	-71.58	-22.26	-638.28	617.85	550.77	67.08	9.211	
9,950.00	9,799.50	9,850.00	9,646.59	34.27	34.70	-71.69	9.36	-638.90	613.56	546.52	67.05	9.151	
10,000.00	9,818.40	9,892.69	9,661.22	34.39	34.70	-71.86	49.45	-639.69	608.79	541.68	67.12	9.071	
10,050.00	9,833.18	9,931.20	9,671.81	34.50	34.69	-72.15	86.46	-640.41	603.61	536.43	67.18	8.985	
10,100.00	9,843.75	9,969.68	9,679.90	34.62	34.68	-72.56	124.06	-641.15	598.03	530.75	67.28	8.889	
10,150.00	9,850.02	10,008.16	9,685.44	34.74	34.67	-73.07	162.13	-641.89	592.08	524.66	67.42	8.782	
10,194.18	9,851.95	10,042.19	9,688.20	34.85	34.66	-73.61	196.04	-642.55	586.54	518.96	67.59	8.678	
10,200.00	9,851.98	10,050.00	9,688.55	34.87	34.66	-73.61	203.84	-642.71	585.82	518.20	67.62	8.663	
10,214.18	9,852.05	10,057.63	9,688.78	34.91	34.66	-73.61	211.46	-642.85	584.06	516.39	67.67	8.631	
10,300.00	9,852.49	10,141.60	9,690.19	35.16	34.71	-73.51	295.40	-644.50	575.15	507.07	68.08	8.448	
10,400.00	9,852.99	10,241.32	9,691.83	35.50	35.01	-73.47	395.09	-646.46	567.87	499.19	68.68	8.269	
10,500.00	9,853.50	10,341.24	9,693.47	35.89	35.37	-73.50	494.97	-648.42	563.94	494.53	69.41	8.125	
10,567.55	9,853.84	10,408.78	9,694.58	36.19	35.64	-73.57	562.50	-649.75	563.17	493.20	69.97	8.049	
10,589.17	9,853.95	10,430.40	9,694.94	36.28	35.74	-73.60	584.11	-650.17	563.25	493.09	70.16	8.028	
10,600.00	9,854.01	10,441.23	9,695.12	36.33	35.79	-73.62	594.93	-650.38	563.33	493.07	70.26	8.018	
10,700.00	9,854.51	10,541.21	9,696.76	36.81	36.25	-73.76	694.89	-652.35	564.06	492.83	71.23	7.919	
10,800.00	9,855.02	10,641.20	9,698.41	37.35	36.77	-73.90	794.84	-654.31	564.79	492.50	72.29	7.813	
10,900.00	9,855.53	10,741.19	9,700.06	37.93	37.33	-74.04	894.79	-656.27	565.52	492.07	73.45	7.699	
11,000.00	9,856.03	10,841.18	9,701.70	38.56	37.94	-74.19	994.75	-658.24	566.26	491.56	74.70	7.580	
11,100.00	9,856.54	10,941.16	9,703.35	39.23	38.59	-74.33	1,094.70	-660.20	567.00	490.96	76.04	7.456	
11,200.00	9,857.04	11,041.15	9,704.99	39.94	39.29	-74.47	1,194.66	-662.16	567.74	490.28	77.46	7.329	
11,300.00	9,857.55	11,141.14	9,706.64	40.70	40.03	-74.61	1,294.61	-664.12	568.49	489.52	78.97	7.199	
11,400.00	9,858.06	11,241.13	9,708.28	41.49	40.80	-74.75	1,394.57	-666.09	569.24	488.70	80.54	7.068	
11,500.00	9,858.56	11,341.12	9,709.93	42.32	41.61	-74.89	1,494.52	-668.05	569.99	487.81	82.19	6.935	
11,600.00	9,859.07	11,441.10	9,711.58	43.18	42.46	-75.03	1,594.48	-670.01	570.75	486.85	83.90	6.802	
11,700.00	9,859.58	11,541.09	9,713.22	44.07	43.34	-75.16	1,694.43	-671.98	571.51	485.83	85.68	6.670	
11,800.00	9,860.08	11,641.08	9,714.87	44.99	44.25	-75.30	1,794.39	-673.94	572.28	484.76	87.52	6.539	
11,900.00	9,860.59	11,741.07	9,716.51	45.94	45.19	-75.44	1,894.34	-675.90	573.04	483.64	89.41	6.409	
12,000.00	9,861.09	11,841.05	9,718.16	46.92	46.15	-75.58	1,994.30	-677.88	573.82	482.46	91.35	6.281	
12,100.00	9,861.60	11,941.04	9,719.80	47.92	47.15	-75.71	2,094.25	-679.83	574.59	481.24	93.35	6.155	
12,200.00	9,862.11	12,041.03	9,721.45	48.94	48.16	-75.85	2,194.21	-681.79	575.37	479.98	95.39	6.032	
12,300.00	9,862.61	12,141.02	9,723.10	49.99	49.20	-75.99	2,294.16	-683.75	576.15	478.67	97.47	5.911	
12,400.00	9,863.12	12,241.00	9,724.74	51.05	50.26	-76.12	2,394.12	-685.72	576.93	477.33	99.60	5.792	
12,500.00	9,863.62	12,340.99	9,726.39	52.14	51.34	-76.26	2,494.07	-687.68	577.72	475.95	101.77	5.677	
12,600.00	9,864.13	12,440.98	9,728.03	53.24	52.44	-76.40	2,594.03	-689.64	578.51	474.54	103.97	5.564	
12,700.00	9,864.64	12,540.97	9,729.68	54.36	53.55	-76.53	2,693.98	-691.60	579.30	473.10	106.20	5.455	
12,800.00	9,865.14	12,640.95	9,731.33	55.49	54.69	-76.66	2,793.93	-693.57	580.10	471.63	108.47	5.348	
12,900.00	9,865.65	12,740.94	9,732.97	56.64	55.83	-76.80	2,893.89	-695.53	580.90	470.13	110.77	5.244	
13,000.00	9,866.15	12,839.41	9,734.37	57.81	56.98	-76.91	2,993.33	-697.46	581.75	468.67	113.09	5.144	
13,100.00	9,866.66	12,939.41	9,734.86	58.99	58.15	-76.93	3,092.31	-699.42	582.82	467.41	115.41	5.050	
13,200.00	9,867.17	13,039.40	9,735.35	60.17	59.34	-76.95	3,192.28	-701.39	583.88	466.13	117.75	4.959	
13,300.00	9,867.67	13,139.40	9,735.84	61.38	60.54	-76.98	3,292.25	-703.35	584.95	464.83	120.12	4.870	
13,400.00	9,868.18	13,239.39	9,736.33	62.59	61.75	-77.00	3,392.23	-705.31	586.01	463.50	122.52	4.783	
13,500.00	9,868.69	13,339.38	9,736.82	63.81	62.97	-77.02	3,492.20	-707.27	587.08	462.15	124.93	4.699	
13,600.00	9,869.19	13,439.38	9,737.31	65.04	64.21	-77.04	3,592.17	-709.23	588.14	460.78	127.36	4.618	
13,700.00	9,869.70	13,539.37	9,737.80	66.28	65.45	-77.07	3,692.15	-711.19	589.21	459.40	129.81	4.539	
13,800.00	9,870.20	13,639.37	9,738.29	67.53	66.70	-77.09	3,792.12	-713.16	590.27	458.00	132.28	4.462	
13,900.00	9,870.71	13,739.36	9,738.78	68.79	67.96	-77.11	3,892.10	-715.12	591.34	456.58	134.76	4.388	
14,000.00	9,871.22	13,839.35	9,739.26	70.06	69.23	-77.13	3,992.07	-717.08	592.41	455.14	137.26	4.316	

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 334H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,100.00	9,871.72	13,939.35	9,739.75	71.33	70.50	-77.15	4,092.04	-719.04	593.47	453.69	139.78	4.248		
14,200.00	9,872.23	14,039.34	9,740.24	72.61	71.79	-77.18	4,192.02	-721.00	594.54	452.23	142.31	4.178		
14,300.00	9,872.73	14,139.34	9,740.73	73.90	73.08	-77.20	4,291.99	-722.96	595.60	450.75	144.85	4.112		
14,400.00	9,873.24	14,239.33	9,741.22	75.19	74.37	-77.22	4,391.96	-724.93	596.67	449.26	147.41	4.048		
14,500.00	9,873.75	14,339.32	9,741.71	76.49	75.68	-77.24	4,491.94	-726.89	597.73	447.76	149.98	3.985		
14,600.00	9,874.25	14,439.32	9,742.20	77.80	76.99	-77.26	4,591.91	-728.85	598.80	446.24	152.56	3.925		
14,700.00	9,874.76	14,539.31	9,742.69	79.11	78.30	-77.28	4,691.88	-730.81	599.87	444.72	155.15	3.866		
14,800.00	9,875.27	14,639.31	9,743.18	80.43	79.62	-77.31	4,791.86	-732.77	600.93	443.18	157.75	3.809		
14,900.00	9,875.77	14,739.30	9,743.67	81.75	80.95	-77.33	4,891.83	-734.73	602.00	441.64	160.36	3.754		
15,000.00	9,876.28	14,839.30	9,744.16	83.07	82.28	-77.35	4,991.81	-736.70	603.07	440.09	162.98	3.700		
15,100.00	9,876.78	14,939.29	9,744.65	84.40	83.61	-77.37	5,091.78	-738.68	604.13	438.52	165.61	3.648		
15,200.00	9,877.29	15,039.28	9,745.14	85.73	84.95	-77.39	5,191.75	-740.62	605.20	436.95	168.25	3.597		
15,300.00	9,877.80	15,139.28	9,745.63	87.07	86.29	-77.41	5,291.73	-742.58	606.27	435.37	170.89	3.548		
15,400.00	9,878.30	15,239.27	9,746.12	88.41	87.64	-77.43	5,391.70	-744.54	607.33	433.78	173.55	3.499		
15,500.00	9,878.81	15,339.27	9,746.61	89.76	88.99	-77.45	5,491.67	-746.50	608.40	432.19	176.21	3.453		
15,600.00	9,879.31	15,439.26	9,747.10	91.11	90.35	-77.47	5,591.65	-748.47	609.47	430.59	178.88	3.407		
15,700.00	9,879.82	15,539.25	9,747.59	92.46	91.70	-77.49	5,691.62	-750.43	610.53	428.98	181.55	3.363		
15,800.00	9,880.33	15,639.25	9,748.08	93.82	93.07	-77.51	5,791.59	-752.39	611.60	427.36	184.24	3.320		
15,900.00	9,880.83	15,739.24	9,748.57	95.17	94.43	-77.53	5,891.57	-754.35	612.67	425.74	186.93	3.278		
16,000.00	9,881.34	15,839.24	9,749.06	96.54	95.80	-77.56	5,991.54	-756.31	613.73	424.11	189.62	3.237		
16,100.00	9,881.85	15,939.23	9,749.55	97.90	97.17	-77.58	6,091.52	-758.28	614.80	422.48	192.32	3.197		
16,200.00	9,882.35	16,039.22	9,750.04	99.27	98.54	-77.60	6,191.49	-760.24	615.87	420.84	195.03	3.158		
16,300.00	9,882.86	16,139.22	9,750.53	100.64	99.92	-77.62	6,291.46	-762.20	616.94	419.20	197.74	3.120		
16,400.00	9,883.36	16,239.21	9,751.02	102.01	101.30	-77.64	6,391.44	-764.16	618.00	417.55	200.46	3.083		
16,500.00	9,883.87	16,339.21	9,751.51	103.38	102.68	-77.66	6,491.41	-766.12	619.07	415.89	203.18	3.047		
16,600.00	9,884.38	16,439.20	9,752.00	104.76	104.06	-77.68	6,591.38	-768.08	620.14	414.23	205.91	3.012		
16,700.00	9,884.88	16,539.19	9,752.49	106.14	105.45	-77.70	6,691.36	-770.05	621.21	412.57	208.64	2.977		
16,800.00	9,885.39	16,639.19	9,752.98	107.52	106.84	-77.72	6,791.33	-772.01	622.27	410.90	211.37	2.944		
16,900.00	9,885.89	16,739.18	9,753.47	108.90	108.23	-77.74	6,891.30	-773.97	623.34	409.23	214.11	2.911		
17,000.00	9,886.40	16,839.18	9,753.96	110.29	109.62	-77.76	6,991.28	-775.93	624.41	407.55	216.86	2.879		
17,100.00	9,886.91	16,939.17	9,754.45	111.68	111.02	-77.78	7,091.25	-777.89	625.48	405.87	219.60	2.848		
17,200.00	9,887.41	17,039.16	9,754.94	113.06	112.41	-77.80	7,191.23	-779.85	626.55	404.19	222.36	2.818		
17,300.00	9,887.92	17,139.16	9,755.43	114.46	113.81	-77.82	7,291.20	-781.82	627.61	402.50	225.11	2.788		
17,400.00	9,888.43	17,239.15	9,755.91	115.85	115.21	-77.83	7,391.17	-783.78	628.68	400.81	227.87	2.759		
17,500.00	9,888.93	17,339.15	9,756.40	117.24	116.61	-77.85	7,491.15	-785.74	629.75	399.12	230.63	2.731		
17,600.00	9,889.44	17,439.14	9,756.89	118.64	118.02	-77.87	7,591.12	-787.70	630.82	397.42	233.40	2.703		
17,700.00	9,889.94	17,539.14	9,757.38	120.03	119.42	-77.89	7,691.09	-789.66	631.89	395.72	236.17	2.676		
17,800.00	9,890.45	17,639.13	9,757.87	121.43	120.83	-77.91	7,791.07	-791.62	632.96	394.01	238.94	2.649		
17,900.00	9,890.96	17,739.12	9,758.36	122.83	122.24	-77.93	7,891.04	-793.59	634.02	392.31	241.72	2.623		
18,000.00	9,891.46	17,839.12	9,758.85	124.23	123.65	-77.95	7,991.01	-795.55	635.09	390.60	244.50	2.598		
18,100.00	9,891.97	17,939.11	9,759.34	125.64	125.06	-77.97	8,090.99	-797.51	636.16	388.88	247.28	2.573		
18,200.00	9,892.47	18,039.11	9,759.83	127.04	126.47	-77.99	8,190.96	-799.47	637.23	387.17	250.06	2.548		
18,300.00	9,892.98	18,139.10	9,760.32	128.44	127.88	-78.01	8,290.94	-801.43	638.30	385.45	252.85	2.524		
18,400.00	9,893.49	18,239.09	9,760.81	129.85	129.30	-78.03	8,390.91	-803.39	639.37	383.73	255.64	2.501		
18,500.00	9,893.99	18,339.09	9,761.30	131.26	130.71	-78.04	8,490.88	-805.36	640.44	382.01	258.43	2.478		
18,600.00	9,894.50	18,439.08	9,761.79	132.67	132.13	-78.06	8,590.86	-807.32	641.51	380.28	261.22	2.456		
18,700.00	9,895.01	18,539.08	9,762.28	134.08	133.55	-78.08	8,690.83	-809.28	642.58	378.56	264.02	2.434		
18,800.00	9,895.51	18,639.07	9,762.77	135.49	134.97	-78.10	8,790.80	-811.24	643.65	376.83	266.82	2.412		
18,900.00	9,896.02	18,739.06	9,763.26	136.90	136.39	-78.12	8,890.78	-813.20	644.71	375.10	269.62	2.391		
19,000.00	9,896.52	18,839.06	9,763.75	138.31	137.81	-78.14	8,990.75	-815.16	645.78	373.36	272.42	2.371		
19,100.00	9,897.03	18,939.05	9,764.24	139.73	139.23	-78.16	9,090.72	-817.13	646.85	371.63	275.23	2.350		
19,200.00	9,897.54	19,039.05	9,764.73	141.14	140.65	-78.17	9,190.70	-819.09	647.92	369.89	278.04	2.330		

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



Scientific Drilling, Intl
Anticollision Report



Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 334H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,300.00	9,898.04	19,139.04	9,765.22	142.56	142.08	-78.19	9,290.67	-821.05	648.99	368.15	280.84	2.311	
19,400.00	9,898.55	19,239.03	9,765.71	143.97	143.50	-78.21	9,390.64	-823.01	850.06	366.41	283.66	2.292	
19,500.00	9,899.05	19,339.03	9,766.20	145.39	144.93	-78.23	9,490.62	-824.97	651.13	364.66	286.47	2.273	
19,600.00	9,899.56	19,439.02	9,766.69	146.81	146.35	-78.25	9,590.59	-826.94	652.20	362.92	289.28	2.255	
19,700.00	9,900.07	19,539.02	9,767.18	148.23	147.78	-78.27	9,690.57	-828.90	653.27	361.17	292.10	2.236	
19,800.00	9,900.57	19,639.01	9,767.67	149.65	149.21	-78.28	9,790.54	-830.86	654.34	359.42	294.92	2.219	
19,831.98	9,901.00	19,670.99	9,767.82	150.10	149.67	-78.27	9,822.51	-831.49	654.73	358.92	295.80	2.213	
19,832.96	9,901.01	19,671.97	9,767.83	150.11	149.68	-78.27	9,823.49	-831.51	654.74	358.91	295.83	2.213	

Company: Devon Energy
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Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 623H (Leam) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	-86.51	158.22	-2,595.59	2,600.42					
100.00	100.00	90.80	90.80	0.12	0.12	-86.51	158.22	-2,595.59	2,600.41	2,600.16	0.25	N/A		
200.00	200.00	190.80	190.80	0.48	0.46	-86.51	158.22	-2,595.59	2,600.41	2,599.46	0.94	2,757.708		
300.00	300.00	290.80	290.80	0.84	0.82	-86.51	158.22	-2,595.59	2,600.41	2,598.75	1.66	1,566.601		
400.00	400.00	390.80	390.80	1.20	1.18	-86.51	158.22	-2,595.59	2,600.41	2,598.03	2.38	1,094.057		
500.00	500.00	490.80	490.80	1.56	1.54	-86.51	158.22	-2,595.59	2,600.41	2,597.31	3.09	840.525		
600.00	600.00	590.80	590.80	1.91	1.90	-86.51	158.22	-2,595.59	2,600.41	2,596.59	3.81	682.390		
700.00	700.00	690.80	690.80	2.27	2.25	-86.51	158.22	-2,595.59	2,600.41	2,595.88	4.53	574.338		
800.00	800.00	790.80	790.80	2.63	2.61	-86.51	158.22	-2,595.59	2,600.41	2,595.16	5.24	495.824		
900.00	900.00	890.80	890.80	2.99	2.97	-86.51	158.22	-2,595.59	2,600.41	2,594.44	5.96	436.195		
1,000.00	1,000.00	990.80	990.80	3.35	3.33	-86.51	158.22	-2,595.59	2,600.41	2,593.73	6.68	389.369		
1,100.00	1,100.00	1,090.80	1,090.80	3.71	3.69	-86.51	158.22	-2,595.59	2,600.41	2,593.01	7.40	351.622		
1,200.00	1,200.00	1,190.80	1,190.80	4.07	4.05	-86.51	158.22	-2,595.59	2,600.41	2,592.29	8.11	320.547		
1,300.00	1,300.00	1,290.80	1,290.80	4.42	4.41	-86.51	158.22	-2,595.59	2,600.41	2,591.58	8.83	294.519		
1,400.00	1,400.00	1,390.80	1,390.80	4.78	4.76	-86.51	158.22	-2,595.59	2,600.41	2,590.86	9.55	272.400		
1,500.00	1,500.00	1,490.80	1,490.80	5.14	5.12	-86.51	158.22	-2,595.59	2,600.41	2,590.14	10.26	253.371		
1,600.00	1,600.00	1,590.80	1,590.80	5.50	5.48	-86.51	158.22	-2,595.59	2,600.41	2,589.43	10.98	236.828		
1,700.00	1,700.00	1,690.80	1,690.80	5.86	5.84	-86.51	158.22	-2,595.59	2,600.41	2,588.71	11.70	222.312		
1,800.00	1,800.00	1,790.80	1,790.80	6.22	6.20	-86.51	158.22	-2,595.59	2,600.41	2,587.99	12.41	209.473		
1,900.00	1,900.00	1,890.80	1,890.80	6.57	6.56	-86.51	158.22	-2,595.59	2,600.41	2,587.27	13.13	198.036		
2,000.00	2,000.00	1,990.80	1,990.80	6.93	6.92	-86.51	158.22	-2,595.59	2,600.41	2,586.56	13.85	187.783		
2,100.00	2,100.00	2,090.80	2,090.80	7.29	7.27	-86.51	158.22	-2,595.59	2,600.41	2,585.84	14.56	178.539		
2,200.00	2,200.00	2,190.80	2,190.80	7.65	7.63	-86.51	158.22	-2,595.59	2,600.41	2,585.12	15.28	170.163		
2,300.00	2,300.00	2,290.80	2,290.80	8.01	7.99	-86.51	158.22	-2,595.59	2,600.41	2,584.41	16.00	162.538		
2,400.00	2,400.00	2,390.80	2,390.80	8.37	8.35	-86.51	158.22	-2,595.59	2,600.41	2,583.69	16.72	155.567		
2,500.00	2,500.00	2,490.80	2,490.80	8.73	8.71	-86.51	158.22	-2,595.59	2,600.41	2,582.97	17.43	149.169		
2,600.00	2,599.99	2,649.15	2,649.13	9.07	9.25	93.51	157.14	-2,593.98	2,599.44	2,581.13	18.31	141.981		
2,700.00	2,699.96	2,813.25	2,813.09	9.39	9.80	93.56	153.45	-2,588.48	2,596.12	2,578.96	19.16	135.480		
2,800.00	2,799.86	2,977.01	2,976.46	9.72	10.35	93.65	147.16	-2,579.12	2,590.45	2,570.44	20.01	129.455		
2,900.00	2,899.88	3,140.24	3,138.91	10.04	10.91	93.77	138.31	-2,565.94	2,582.43	2,561.58	20.85	123.849		
3,000.00	2,999.37	3,302.78	3,300.16	10.37	11.48	93.93	126.93	-2,549.00	2,572.08	2,550.40	21.68	118.614		
3,100.00	3,098.90	3,464.48	3,459.92	10.71	12.06	94.13	113.08	-2,528.39	2,559.43	2,536.92	22.51	113.699		
3,200.00	3,198.36	3,625.11	3,617.90	11.04	12.65	94.17	96.85	-2,504.22	2,544.44	2,521.11	23.33	109.064		
3,300.00	3,297.81	3,784.89	3,775.20	11.38	13.10	94.18	83.34	-2,484.10	2,527.57	2,503.51	24.06	105.045		
3,400.00	3,397.26	3,943.43	3,931.66	11.73	13.48	94.18	72.10	-2,467.37	2,510.56	2,485.80	24.75	101.418		
3,500.00	3,496.71	3,941.97	3,928.12	12.07	13.86	94.19	60.88	-2,450.65	2,493.55	2,468.09	25.45	97.966		
3,600.00	3,596.17	4,040.51	4,024.58	12.42	14.25	94.19	49.63	-2,433.92	2,476.53	2,450.38	26.16	94.681		
3,700.00	3,695.62	4,139.06	4,121.04	12.77	14.64	94.19	38.39	-2,417.19	2,459.52	2,432.66	26.87	91.551		
3,800.00	3,795.07	4,237.60	4,217.50	13.13	15.04	94.20	27.15	-2,400.46	2,442.51	2,414.94	27.58	88.568		
3,900.00	3,894.52	4,336.14	4,313.96	13.48	15.44	94.20	15.92	-2,383.73	2,425.50	2,397.21	28.29	85.724		
4,000.00	3,993.97	4,434.68	4,410.42	13.84	15.84	94.20	4.68	-2,367.01	2,408.49	2,379.48	29.01	83.009		
4,100.00	4,093.43	4,533.23	4,506.88	14.20	16.25	94.21	-6.56	-2,350.28	2,391.48	2,361.74	29.74	80.417		
4,200.00	4,192.88	4,631.77	4,603.34	14.56	16.65	94.21	-17.79	-2,333.55	2,374.47	2,344.00	30.47	77.939		
4,300.00	4,292.33	4,730.31	4,699.80	14.92	17.07	94.21	-29.03	-2,316.82	2,357.46	2,326.26	31.20	75.570		
4,400.00	4,391.78	4,828.85	4,796.26	15.28	17.48	94.22	-40.27	-2,300.09	2,340.45	2,308.52	31.93	73.303		
4,500.00	4,491.23	4,927.40	4,892.72	15.65	17.90	94.22	-51.50	-2,283.37	2,323.44	2,290.77	32.66	71.132		
4,600.00	4,590.69	5,025.94	4,989.18	16.01	18.31	94.22	-62.74	-2,266.64	2,306.42	2,273.02	33.40	69.051		
4,700.00	4,690.14	5,124.48	5,085.64	16.38	18.73	94.23	-73.98	-2,249.91	2,289.41	2,255.27	34.14	67.056		
4,800.00	4,789.59	5,223.02	5,182.10	16.75	19.15	94.23	-85.21	-2,233.18	2,272.40	2,237.52	34.88	65.142		
4,900.00	4,889.04	5,321.57	5,278.56	17.11	19.58	94.23	-96.45	-2,216.45	2,255.39	2,219.76	35.63	63.304		
5,000.00	4,988.50	5,420.11	5,375.02	17.48	20.00	94.24	-107.68	-2,199.73	2,238.38	2,202.01	36.37	61.538		
5,100.00	5,087.95	5,518.65	5,471.48	17.85	20.43	94.24	-118.92	-2,183.00	2,221.37	2,184.25	37.12	59.840		

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

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Offset Design Spud Muffin 31-30 - 623H (Leam) - OH - Planned												Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDMG												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,200.00	5,187.40	5,617.19	5,567.94	18.22	20.88	94.25	-130.16	-2,166.27	2,204.36	2,166.49	37.87	58.206	
5,300.00	5,286.85	5,715.73	5,664.40	18.60	21.29	94.25	-141.39	-2,149.54	2,187.35	2,148.73	38.62	56.634	
5,400.00	5,386.30	5,814.28	5,760.88	18.97	21.72	94.25	-152.63	-2,132.81	2,170.34	2,130.96	39.37	55.120	
5,500.00	5,485.76	5,912.82	5,857.32	19.34	22.15	94.26	-163.87	-2,116.09	2,153.33	2,113.20	40.13	53.660	
5,600.00	5,585.21	6,011.36	5,953.78	19.72	22.58	94.26	-175.10	-2,099.36	2,136.32	2,095.43	40.88	52.253	
5,700.00	5,684.66	6,109.90	6,050.24	20.09	23.01	94.27	-186.34	-2,082.63	2,119.30	2,077.66	41.64	50.895	
5,800.00	5,784.11	6,208.45	6,146.70	20.46	23.45	94.27	-197.58	-2,065.90	2,102.29	2,059.90	42.40	49.585	
5,900.00	5,883.57	6,306.99	6,243.16	20.84	23.88	94.27	-208.81	-2,049.17	2,085.28	2,042.13	43.16	48.319	
6,000.00	5,983.02	6,405.53	6,339.62	21.21	24.32	94.28	-220.05	-2,032.45	2,068.27	2,024.36	43.92	47.096	
6,100.00	6,082.56	6,504.06	6,436.06	21.59	24.76	94.09	-231.28	-2,015.72	2,051.20	2,006.52	44.68	45.913	
6,200.00	6,182.25	6,602.54	6,532.46	21.96	25.20	93.84	-242.51	-1,999.00	2,034.00	1,988.57	45.43	44.770	
6,300.00	6,282.06	6,700.94	6,628.78	22.32	25.63	93.54	-253.73	-1,982.30	2,016.70	1,970.51	46.19	43.665	
6,400.00	6,381.96	6,799.23	6,724.99	22.68	26.07	93.19	-264.94	-1,965.62	1,999.30	1,952.37	46.94	42.596	
6,500.00	6,481.93	6,897.38	6,821.07	23.03	26.51	92.79	-276.13	-1,948.95	1,981.83	1,934.15	47.68	41.562	
6,600.00	6,581.92	6,995.36	6,916.98	23.38	26.95	-87.67	-287.31	-1,932.32	1,964.32	1,915.90	48.42	40.565	
6,700.00	6,681.92	7,093.25	7,012.80	23.71	27.39	-87.98	-298.47	-1,915.70	1,946.82	1,897.67	49.16	39.604	
6,800.00	6,781.92	7,191.13	7,108.62	24.04	27.83	-88.30	-309.63	-1,899.09	1,929.38	1,879.49	49.89	38.671	
6,900.00	6,881.92	7,289.02	7,204.43	24.38	28.27	-88.63	-320.79	-1,882.47	1,912.01	1,861.38	50.63	37.764	
7,000.00	6,981.92	7,386.91	7,300.25	24.72	28.71	-88.96	-331.95	-1,865.85	1,894.69	1,843.32	51.37	36.884	
7,100.00	7,081.92	7,484.79	7,396.07	25.05	29.15	-89.29	-343.11	-1,849.24	1,877.43	1,825.32	52.11	36.027	
7,200.00	7,181.92	7,582.68	7,491.89	25.39	29.59	-89.64	-354.28	-1,832.62	1,860.24	1,807.39	52.86	35.195	
7,300.00	7,281.92	7,681.26	7,568.90	25.73	29.94	-89.91	-365.44	-1,815.95	1,843.60	1,790.02	53.58	34.410	
7,400.00	7,381.92	7,778.80	7,645.10	26.07	30.28	-90.16	-376.60	-1,800.70	1,826.11	1,773.82	54.29	33.672	
7,500.00	7,481.92	7,876.73	7,721.86	26.41	30.61	-90.40	-387.75	-1,786.56	1,813.80	1,758.80	55.00	32.978	
7,600.00	7,581.92	7,974.66	7,804.07	26.75	30.96	-90.64	-398.91	-1,772.41	1,800.65	1,744.94	55.71	32.322	
7,700.00	7,681.92	8,072.59	7,876.93	27.08	31.26	-90.83	-410.06	-1,758.26	1,788.65	1,732.25	56.39	31.718	
7,800.00	7,781.92	8,170.52	7,955.16	27.43	31.58	-91.03	-421.22	-1,744.11	1,777.81	1,720.73	57.07	31.149	
7,900.00	7,881.92	8,268.45	8,033.80	27.77	31.89	-91.20	-432.37	-1,729.96	1,768.12	1,710.37	57.75	30.618	
8,000.00	7,981.92	8,366.38	8,112.80	28.11	32.20	-91.36	-443.53	-1,715.81	1,758.59	1,701.17	58.41	30.124	
8,100.00	8,081.92	8,464.31	8,201.27	28.45	32.53	-91.51	-454.68	-1,701.66	1,748.90	1,693.13	59.09	29.651	
8,200.00	8,181.92	8,562.24	8,271.73	28.79	32.79	-91.61	-465.84	-1,687.51	1,745.96	1,686.25	59.71	29.241	
8,300.00	8,281.92	8,660.17	8,351.57	29.13	33.07	-91.70	-476.99	-1,673.36	1,740.86	1,680.51	60.34	28.849	
8,400.00	8,381.92	8,758.10	8,431.59	29.48	33.35	-91.78	-488.15	-1,659.21	1,736.90	1,675.93	60.97	28.480	
8,500.00	8,481.92	8,856.03	8,511.75	29.82	33.62	-91.83	-499.30	-1,645.06	1,732.75	1,672.50	61.58	28.161	
8,600.00	8,581.92	8,953.96	8,600.74	30.16	33.91	-91.87	-510.46	-1,630.91	1,728.60	1,668.21	62.22	27.845	
8,700.00	8,681.92	9,051.89	8,672.72	30.51	34.14	-91.88	-521.61	-1,616.76	1,724.45	1,664.06	62.76	27.594	
8,800.00	8,781.92	9,149.82	8,772.72	30.85	34.45	-91.88	-532.77	-1,602.61	1,720.30	1,660.00	63.34	27.305	
8,900.00	8,881.92	9,247.75	8,872.72	31.20	34.76	-91.88	-543.92	-1,588.46	1,716.15	1,656.00	64.09	27.021	
9,000.00	8,981.92	9,345.68	8,972.72	31.54	35.07	-91.88	-555.07	-1,574.31	1,712.00	1,652.00	64.76	26.743	
9,100.00	9,081.92	9,443.61	9,072.72	31.89	35.38	-91.88	-566.22	-1,560.16	1,707.85	1,648.00	65.43	26.469	
9,200.00	9,181.92	9,541.54	9,172.72	32.23	35.69	-91.88	-577.37	-1,546.01	1,703.70	1,644.00	66.10	26.202	
9,297.08	9,279.00	9,371.67	9,272.40	32.57	36.00	-91.86	-588.52	-1,531.86	1,703.83	1,665.08	66.76	25.943	
9,300.00	9,281.92	9,374.91	9,275.63	32.58	36.01	-93.85	-589.67	-1,531.86	1,703.83	1,665.08	66.78	25.935	
9,350.00	9,331.85	9,430.11	9,330.54	32.75	36.17	-93.80	-590.82	-1,531.86	1,703.83	1,665.08	67.11	25.798	
9,400.00	9,381.37	9,484.98	9,384.33	32.91	36.31	-93.79	-591.97	-1,531.86	1,703.83	1,665.08	67.43	25.663	
9,450.00	9,430.11	9,539.45	9,436.49	33.06	36.45	-93.83	-593.12	-1,531.86	1,703.83	1,665.08	67.71	25.530	
9,500.00	9,477.71	9,593.48	9,486.51	33.21	36.56	-93.91	-594.27	-1,531.86	1,703.83	1,665.08	67.98	25.398	
9,550.00	9,523.79	9,647.03	9,533.99	33.35	36.66	-94.04	-595.42	-1,531.86	1,703.83	1,665.08	68.22	25.267	
9,600.00	9,568.01	9,700.07	9,578.53	33.48	36.74	-94.21	-596.57	-1,531.86	1,703.83	1,665.08	68.44	25.136	
9,650.00	9,610.02	9,752.58	9,619.83	33.60	36.80	-94.43	-597.72	-1,531.86	1,703.83	1,665.08	68.65	25.006	
9,700.00	9,649.52	9,804.56	9,657.61	33.72	36.84	-94.69	-598.87	-1,531.86	1,703.83	1,665.08	68.83	24.874	
9,750.00	9,688.20	9,855.99	9,691.67	33.83	36.88	-94.99	-599.99	-1,531.86	1,703.83	1,665.08	69.01	24.741	

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 623H (Leam) - OH - Planned													Offset Site Error: 0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error: 0.00 usft
Reference				Offset			Semi Major Axis		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,800.00	9,719.78	9,906.88	9,721.83	33.94	36.89	-85.33	-168.55	-1,730.92	1,702.18	1,833.00	69.18	24.607	
9,850.00	9,750.01	9,957.24	9,747.99	34.05	36.89	-85.70	-125.54	-1,730.92	1,696.61	1,627.27	69.34	24.469	
9,900.00	9,776.65	10,007.08	9,770.06	34.16	36.89	-86.11	-80.86	-1,730.92	1,690.70	1,621.21	69.49	24.329	
9,950.00	9,799.50	10,056.44	9,788.01	34.27	36.87	-86.56	-34.91	-1,730.92	1,684.51	1,614.87	69.65	24.186	
10,000.00	9,818.40	10,105.32	9,801.83	34.39	36.84	-87.03	11.97	-1,730.92	1,678.09	1,608.28	69.81	24.039	
10,050.00	9,833.18	10,153.77	9,811.53	34.50	36.81	-87.52	59.42	-1,730.92	1,671.48	1,601.51	69.96	23.890	
10,100.00	9,843.75	10,201.81	9,817.16	34.62	36.77	-88.04	107.12	-1,730.92	1,664.72	1,594.59	70.13	23.739	
10,150.00	9,850.02	10,249.91	9,818.90	34.74	36.72	-88.58	155.18	-1,730.92	1,657.87	1,587.58	70.30	23.584	
10,184.18	9,851.95	10,293.63	9,819.44	34.85	36.69	-89.14	198.89	-1,730.92	1,651.75	1,581.29	70.46	23.443	
10,200.00	9,851.98	10,299.39	9,819.51	34.87	36.68	-89.14	204.66	-1,730.92	1,650.94	1,580.46	70.48	23.424	
10,214.18	9,852.05	10,313.43	9,819.69	34.91	36.67	-89.15	218.70	-1,730.92	1,648.97	1,578.42	70.54	23.375	
10,300.00	9,852.49	10,398.58	9,820.74	35.16	36.61	-89.17	303.84	-1,730.92	1,638.29	1,567.34	70.94	23.092	
10,400.00	9,852.99	10,498.15	9,821.98	35.50	36.55	-89.21	403.40	-1,730.92	1,629.07	1,557.55	71.52	22.777	
10,500.00	9,853.50	10,597.98	9,823.21	35.89	36.55	-89.24	503.22	-1,730.92	1,623.34	1,551.13	72.21	22.481	
10,589.17	9,853.95	10,687.12	9,824.32	36.28	36.73	-89.28	592.35	-1,730.92	1,621.16	1,548.25	72.91	22.236	
10,600.00	9,854.01	10,697.94	9,824.45	36.33	36.76	-89.28	603.18	-1,730.92	1,621.07	1,548.07	72.99	22.208	
10,700.00	9,854.51	10,797.94	9,825.69	36.81	37.18	-89.30	703.16	-1,730.92	1,620.18	1,546.30	73.88	21.929	
10,800.00	9,855.02	10,897.93	9,826.93	37.35	37.66	-89.33	803.15	-1,730.92	1,619.30	1,544.43	74.88	21.626	
10,900.00	9,855.53	10,997.93	9,828.17	37.93	38.20	-89.35	903.14	-1,730.92	1,618.42	1,542.45	75.97	21.304	
11,000.00	9,856.03	11,097.92	9,829.41	38.56	38.79	-89.38	1,003.12	-1,730.92	1,617.54	1,540.39	77.15	20.965	
11,100.00	9,856.54	11,197.91	9,830.65	39.23	39.42	-89.41	1,103.11	-1,730.92	1,616.66	1,538.23	78.43	20.613	
11,200.00	9,857.04	11,297.91	9,831.89	39.94	40.09	-89.43	1,203.09	-1,730.92	1,615.78	1,535.99	79.79	20.250	
11,300.00	9,857.55	11,397.90	9,833.13	40.70	40.80	-89.46	1,303.08	-1,730.92	1,614.90	1,533.66	81.24	19.879	
11,400.00	9,858.06	11,497.89	9,834.36	41.49	41.54	-89.48	1,403.07	-1,730.92	1,614.02	1,531.26	82.76	19.503	
11,500.00	9,858.56	11,597.89	9,835.60	42.32	42.32	-89.51	1,503.05	-1,730.92	1,613.14	1,528.79	84.35	19.124	
11,600.00	9,859.07	11,802.13	9,836.14	43.18	44.00	-89.56	1,707.15	-1,724.93	1,609.64	1,522.75	86.89	18.525	
11,700.00	9,859.58	12,021.65	9,840.86	44.07	45.88	-89.61	1,925.43	-1,702.35	1,598.37	1,508.84	89.53	17.854	
11,800.00	9,860.08	12,120.55	9,842.09	44.99	46.76	-89.63	2,023.36	-1,688.59	1,583.58	1,492.28	91.31	17.344	
11,900.00	9,860.59	12,219.45	9,843.31	45.94	47.67	-89.66	2,121.29	-1,674.82	1,568.80	1,475.66	93.14	16.844	
12,000.00	9,861.09	12,318.35	9,844.54	46.92	48.60	-89.68	2,219.22	-1,661.06	1,554.01	1,458.99	95.02	16.354	
12,100.00	9,861.60	12,416.52	9,845.76	47.92	49.54	-89.71	2,316.43	-1,647.40	1,539.23	1,442.28	96.95	15.877	
12,200.00	9,862.11	12,481.52	9,846.96	48.94	50.18	-89.72	2,380.89	-1,639.09	1,525.58	1,426.92	98.65	15.464	
12,300.00	9,862.61	12,546.41	9,847.37	49.99	50.83	-89.74	2,445.42	-1,632.25	1,514.17	1,413.78	100.38	15.084	
12,400.00	9,863.12	12,600.00	9,848.03	51.05	51.38	-89.75	2,498.81	-1,627.70	1,505.09	1,403.09	102.00	14.756	
12,500.00	9,863.62	12,677.06	9,848.99	52.14	52.18	-89.78	2,575.71	-1,622.92	1,498.14	1,394.27	103.88	14.422	
12,600.00	9,864.13	12,742.67	9,849.80	53.24	52.87	-89.79	2,641.27	-1,620.49	1,493.55	1,387.92	105.64	14.139	
12,700.00	9,864.64	12,808.39	9,850.62	54.36	53.58	-89.81	2,706.97	-1,619.55	1,491.26	1,383.86	107.39	13.886	
12,800.00	9,865.14	12,904.29	9,851.81	55.49	54.62	-89.84	2,802.87	-1,619.54	1,490.36	1,380.80	109.57	13.602	
12,900.00	9,865.65	13,004.28	9,853.05	56.64	55.73	-89.87	2,902.85	-1,619.54	1,489.49	1,377.66	111.83	13.319	
12,950.09	9,865.90	13,041.35	9,853.51	57.23	56.14	-89.88	2,939.91	-1,619.65	1,489.22	1,376.42	112.79	13.203 CC	
13,000.00	9,866.15	13,074.16	9,853.91	57.81	56.51	-89.89	2,972.72	-1,620.13	1,489.50	1,375.82	113.69	13.102	
13,100.00	9,866.66	13,139.95	9,854.73	58.99	57.26	-89.91	3,038.47	-1,622.21	1,491.80	1,376.32	115.48	12.919	
13,200.00	9,867.17	13,200.00	9,855.48	60.17	57.94	-89.92	3,098.43	-1,625.43	1,496.40	1,379.26	117.14	12.774	
13,300.00	9,867.67	13,271.11	9,856.36	61.38	58.77	-89.94	3,169.32	-1,630.86	1,503.26	1,384.27	118.99	12.634	
13,400.00	9,868.18	13,336.37	9,857.17	62.59	59.53	-89.96	3,234.25	-1,637.40	1,512.40	1,391.69	120.71	12.530	
13,500.00	9,868.69	13,400.00	9,857.96	63.81	60.29	-89.98	3,297.39	-1,645.19	1,523.80	1,401.44	122.36	12.453	
13,600.00	9,869.19	13,492.41	9,859.10	65.04	61.39	-90.00	3,388.90	-1,658.00	1,536.79	1,412.14	124.65	12.328	
13,700.00	9,869.70	13,591.55	9,860.33	66.28	62.59	-90.03	3,487.07	-1,671.80	1,549.85	1,422.73	127.12	12.192	
13,800.00	9,870.20	13,690.69	9,861.56	67.53	63.81	-90.06	3,585.24	-1,685.60	1,562.90	1,433.29	129.61	12.059	
13,900.00	9,870.71	13,789.84	9,862.79	68.79	65.04	-90.09	3,683.41	-1,699.39	1,575.95	1,443.84	132.12	11.929	
14,000.00	9,871.22	13,979.12	9,865.14	70.06	67.42	-90.13	3,871.40	-1,721.15	1,586.95	1,450.35	136.59	11.618	
14,100.00	9,871.72	14,203.53	9,867.92	71.33	70.24	-90.19	4,095.52	-1,730.95	1,590.44	1,449.14	141.30	11.256	

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 623H (Leam) - OH - Planned													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)					
14,200.00	9,872.23	14,310.76	9,868.31	72.61	71.59	-90.19	4,202.74	-1,730.97	1,589.58	1,445.64	143.95	11.043	
14,300.00	9,872.73	14,410.75	9,868.31	73.90	72.85	-90.17	4,302.74	-1,730.97	1,588.71	1,442.21	146.50	10.845	
14,400.00	9,873.24	14,510.75	9,868.31	75.19	74.12	-90.15	4,402.73	-1,730.97	1,587.84	1,438.77	149.06	10.652	
14,500.00	9,873.75	14,610.74	9,868.31	76.49	75.39	-90.13	4,502.73	-1,730.97	1,586.96	1,435.33	151.64	10.466	
14,600.00	9,874.25	14,710.74	9,868.31	77.80	76.68	-90.11	4,602.72	-1,730.97	1,586.09	1,431.88	154.22	10.284	
14,700.00	9,874.76	14,810.73	9,868.31	79.11	77.96	-90.10	4,702.72	-1,730.97	1,585.21	1,428.39	156.82	10.108	
14,800.00	9,875.27	14,910.73	9,868.31	80.43	79.26	-90.08	4,802.71	-1,730.97	1,584.34	1,424.91	159.43	9.937	
14,900.00	9,875.77	15,010.72	9,868.31	81.75	80.56	-90.06	4,902.71	-1,730.97	1,583.47	1,421.41	162.05	9.771	
15,000.00	9,876.28	15,110.72	9,868.31	83.07	81.88	-90.04	5,002.70	-1,730.97	1,582.59	1,417.91	164.68	9.610	
15,100.00	9,876.78	15,210.71	9,868.31	84.40	83.17	-90.02	5,102.70	-1,730.97	1,581.72	1,414.40	167.32	9.453	
15,200.00	9,877.29	15,310.71	9,868.31	85.73	84.48	-90.01	5,202.69	-1,730.97	1,580.85	1,410.88	169.97	9.301	
15,300.00	9,877.80	15,410.70	9,868.31	87.07	85.80	-89.99	5,302.69	-1,730.97	1,579.98	1,407.35	172.63	9.152	
15,400.00	9,878.30	15,510.70	9,868.31	88.41	87.13	-89.97	5,402.68	-1,730.97	1,579.10	1,403.81	175.30	9.008	
15,500.00	9,878.81	15,610.69	9,868.31	89.76	88.45	-89.95	5,502.68	-1,730.97	1,578.23	1,400.26	177.97	8.868	
15,600.00	9,879.31	15,710.69	9,868.31	91.11	89.78	-89.93	5,602.67	-1,730.97	1,577.36	1,396.71	180.65	8.732	
15,700.00	9,879.82	15,810.68	9,868.31	92.46	91.12	-89.91	5,702.67	-1,730.97	1,576.49	1,393.15	183.34	8.599	
15,800.00	9,880.33	15,910.68	9,868.31	93.82	92.46	-89.89	5,802.66	-1,730.97	1,575.62	1,389.58	186.03	8.470	
15,900.00	9,880.83	16,010.67	9,868.31	95.17	93.80	-89.88	5,902.66	-1,730.97	1,574.74	1,386.01	188.73	8.344	
16,000.00	9,881.34	16,110.67	9,868.31	96.54	95.14	-89.86	6,002.65	-1,730.97	1,573.87	1,382.43	191.44	8.221	
16,100.00	9,881.85	16,210.66	9,868.31	97.90	96.49	-89.84	6,102.65	-1,730.97	1,573.00	1,378.85	194.15	8.102	
16,200.00	9,882.35	16,310.66	9,868.31	99.27	97.84	-89.82	6,202.64	-1,730.97	1,572.13	1,375.26	196.87	7.986	
16,300.00	9,882.86	16,410.65	9,868.31	100.64	99.20	-89.80	6,302.64	-1,730.97	1,571.26	1,371.67	199.59	7.872	
16,400.00	9,883.36	16,510.65	9,868.31	102.01	100.55	-89.78	6,402.63	-1,730.97	1,570.39	1,368.07	202.32	7.762	
16,500.00	9,883.87	16,610.64	9,868.31	103.38	101.91	-89.77	6,502.63	-1,730.97	1,569.52	1,364.46	205.06	7.654	
16,600.00	9,884.38	16,710.64	9,868.31	104.76	103.27	-89.75	6,602.62	-1,730.97	1,568.65	1,360.85	207.80	7.549	
16,700.00	9,884.88	16,810.63	9,868.31	106.14	104.64	-89.73	6,702.62	-1,730.97	1,567.78	1,357.24	210.54	7.446	
16,800.00	9,885.39	16,910.63	9,868.31	107.52	106.01	-89.71	6,802.61	-1,730.97	1,566.91	1,353.62	213.29	7.346	
16,900.00	9,885.89	17,010.59	9,868.16	108.90	107.37	-89.69	6,902.57	-1,730.97	1,566.04	1,350.00	216.04	7.249	
17,000.00	9,886.40	17,110.58	9,867.80	110.29	108.75	-89.65	7,002.57	-1,730.97	1,565.17	1,346.37	218.80	7.154	
17,100.00	9,886.91	17,210.57	9,867.43	111.68	110.12	-89.62	7,102.56	-1,730.97	1,564.30	1,342.75	221.56	7.061	
17,200.00	9,887.41	17,310.57	9,867.06	113.06	111.50	-89.59	7,202.55	-1,730.97	1,563.44	1,339.12	224.32	6.970	
17,300.00	9,887.92	17,410.56	9,866.70	114.46	112.87	-89.56	7,302.54	-1,730.97	1,562.57	1,335.48	227.09	6.881	
17,400.00	9,888.43	17,510.55	9,866.33	115.85	114.25	-89.52	7,402.53	-1,730.97	1,561.70	1,331.85	229.86	6.794	
17,500.00	9,888.93	17,610.54	9,865.96	117.24	115.64	-89.49	7,502.52	-1,730.97	1,560.84	1,328.21	232.63	6.710	
17,600.00	9,889.44	17,710.54	9,865.60	118.64	117.02	-89.46	7,602.52	-1,730.97	1,559.97	1,324.57	235.41	6.627	
17,700.00	9,889.94	17,810.53	9,865.23	120.03	118.40	-89.43	7,702.51	-1,730.97	1,559.11	1,320.92	238.19	6.546	
17,800.00	9,890.45	17,910.52	9,864.86	121.43	119.79	-89.39	7,802.50	-1,730.97	1,558.25	1,317.27	240.97	6.467	
17,900.00	9,890.96	18,010.51	9,864.50	122.83	121.18	-89.36	7,902.49	-1,730.97	1,557.38	1,313.62	243.76	6.389	
18,000.00	9,891.46	18,110.51	9,864.13	124.23	122.57	-89.33	8,002.48	-1,730.97	1,556.52	1,309.97	246.55	6.313	
18,100.00	9,891.97	18,210.50	9,863.76	125.64	123.96	-89.30	8,102.48	-1,730.97	1,555.66	1,306.32	249.34	6.239	
18,200.00	9,892.47	18,310.49	9,863.40	127.04	125.35	-89.26	8,202.47	-1,730.97	1,554.80	1,302.68	252.13	6.167	
18,300.00	9,892.98	18,410.48	9,863.03	128.44	126.75	-89.23	8,302.46	-1,730.97	1,553.94	1,299.00	254.93	6.096	
18,400.00	9,893.49	18,510.48	9,862.67	129.85	128.14	-89.20	8,402.45	-1,730.97	1,553.07	1,295.34	257.73	6.026	
18,500.00	9,893.99	18,610.47	9,862.30	131.26	129.54	-89.17	8,502.44	-1,730.97	1,552.21	1,291.68	260.53	5.958	
18,600.00	9,894.50	18,710.46	9,861.93	132.67	130.94	-89.13	8,602.43	-1,730.97	1,551.35	1,288.02	263.34	5.891	
18,700.00	9,895.01	18,810.45	9,861.57	134.08	132.34	-89.10	8,702.43	-1,730.97	1,550.50	1,284.35	266.14	5.826	
18,800.00	9,895.51	18,910.45	9,861.20	135.49	133.74	-89.07	8,802.42	-1,730.97	1,549.64	1,280.69	268.95	5.762	
18,900.00	9,896.02	19,010.44	9,860.83	136.90	135.14	-89.04	8,902.41	-1,730.97	1,548.78	1,277.02	271.76	5.699	
19,000.00	9,896.52	19,110.43	9,860.47	138.31	136.54	-89.00	9,002.40	-1,730.97	1,547.92	1,273.35	274.57	5.638	
19,100.00	9,897.03	19,210.42	9,860.10	139.73	137.95	-88.97	9,102.39	-1,730.97	1,547.06	1,269.68	277.39	5.577	
19,200.00	9,897.54	19,310.41	9,859.73	141.14	139.35	-88.94	9,202.38	-1,730.97	1,546.21	1,266.00	280.20	5.518	
19,300.00	9,898.04	19,410.41	9,859.37	142.56	140.76	-88.90	9,302.38	-1,730.97	1,545.35	1,262.33	283.02	5.460	

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 623H (Leam) - OH - Planned													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,400.00	9,898.55	19,510.40	9,859.00	143.97	142.17	-88.87	9,402.37	-1,730.97	1,544.50	1,258.66	285.84	5.403		
19,500.00	9,899.05	19,610.39	9,858.63	145.39	143.57	-88.84	9,502.36	-1,730.97	1,543.64	1,254.98	288.66	5.348		
19,600.00	9,899.56	19,710.38	9,858.27	146.81	144.98	-88.81	9,602.35	-1,730.97	1,542.79	1,251.30	291.48	5.293		
19,700.00	9,900.07	19,810.38	9,857.80	148.23	146.39	-88.77	9,702.34	-1,730.97	1,541.93	1,247.62	294.31	5.239		
19,800.00	9,900.57	19,910.37	9,857.53	149.65	147.80	-88.74	9,802.33	-1,730.97	1,541.08	1,243.94	297.13	5.186		
19,831.98	9,901.00	19,942.34	9,857.42	150.10	148.25	-88.72	9,834.31	-1,730.97	1,540.80	1,242.77	298.04	5.170		
19,832.98	9,901.01	19,943.33	9,857.41	150.11	148.27	-88.72	9,835.29	-1,730.97	1,540.79	1,242.73	298.06	5.169 ES, SF		

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 738H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-126.31	-148.52	-202.11	250.81					
100.00	100.00	100.00	100.00	0.12	0.12	-126.31	-148.52	-202.11	250.81	250.57	0.24	1,028.918		
200.00	200.00	200.00	200.00	0.48	0.48	-126.31	-148.52	-202.11	250.81	249.85	0.96	261.069		
300.00	300.00	300.00	300.00	0.84	0.84	-126.31	-148.52	-202.11	250.81	249.13	1.68	149.501		
400.00	400.00	400.00	400.00	1.20	1.20	-126.31	-148.52	-202.11	250.81	248.42	2.39	104.740		
500.00	500.00	500.00	500.00	1.56	1.56	-126.31	-148.52	-202.11	250.81	247.70	3.11	80.607		
600.00	600.00	600.00	600.00	1.91	1.91	-126.31	-148.52	-202.11	250.81	246.98	3.83	65.512		
700.00	700.00	700.00	700.00	2.27	2.27	-126.31	-148.52	-202.11	250.81	246.26	4.55	55.179		
800.00	800.00	800.00	800.00	2.63	2.63	-126.31	-148.52	-202.11	250.81	245.55	5.26	47.661		
900.00	900.00	900.00	900.00	2.99	2.99	-126.31	-148.52	-202.11	250.81	244.83	5.98	41.948		
1,000.00	1,000.00	1,000.00	1,000.00	3.35	3.35	-126.31	-148.52	-202.11	250.81	244.11	6.70	37.455		
1,100.00	1,100.00	1,100.00	1,100.00	3.71	3.71	-126.31	-148.52	-202.11	250.81	243.40	7.41	33.833		
1,200.00	1,200.00	1,200.00	1,200.00	4.07	4.07	-126.31	-148.52	-202.11	250.81	242.68	8.13	30.849		
1,300.00	1,300.00	1,300.00	1,300.00	4.42	4.42	-126.31	-148.52	-202.11	250.81	241.96	8.85	28.349		
1,400.00	1,400.00	1,400.00	1,400.00	4.78	4.78	-126.31	-148.52	-202.11	250.81	241.25	9.56	26.224		
1,500.00	1,500.00	1,500.00	1,500.00	5.14	5.14	-126.31	-148.52	-202.11	250.81	240.53	10.28	24.396		
1,600.00	1,600.00	1,600.00	1,600.00	5.50	5.50	-126.31	-148.52	-202.11	250.81	239.81	11.00	22.805		
1,700.00	1,700.00	1,700.00	1,700.00	5.86	5.86	-126.31	-148.52	-202.11	250.81	239.10	11.71	21.410		
1,800.00	1,800.00	1,800.00	1,800.00	6.22	6.22	-126.31	-148.52	-202.11	250.81	238.38	12.43	20.175		
1,900.00	1,900.00	1,900.00	1,900.00	6.57	6.57	-126.31	-148.52	-202.11	250.81	237.66	13.15	19.075		
2,000.00	2,000.00	2,000.00	2,000.00	6.93	6.93	-126.31	-148.52	-202.11	250.81	236.94	13.87	18.089		
2,100.00	2,100.00	2,100.00	2,100.00	7.29	7.29	-126.31	-148.52	-202.11	250.81	236.23	14.58	17.199		
2,200.00	2,200.00	2,200.00	2,200.00	7.65	7.65	-126.31	-148.52	-202.11	250.81	235.51	15.30	16.393		
2,300.00	2,300.00	2,300.00	2,300.00	8.01	8.01	-126.31	-148.52	-202.11	250.81	234.79	16.02	15.659		
2,400.00	2,400.00	2,400.00	2,400.00	8.37	8.37	-126.31	-148.52	-202.11	250.81	234.08	16.73	14.989		
2,500.00	2,500.00	2,500.00	2,500.00	8.73	8.73	-126.31	-148.52	-202.11	250.81	233.36	17.45	14.373		
2,600.00	2,599.99	2,598.37	2,598.36	9.07	9.06	53.67	-149.34	-201.90	250.62	232.49	18.12	13.827		
2,700.00	2,699.96	2,696.73	2,696.69	9.39	9.38	53.61	-151.80	-201.29	250.05	231.28	18.77	13.324		
2,800.00	2,799.88	2,795.09	2,794.96	9.72	9.70	53.52	-155.89	-200.27	249.09	229.68	19.41	12.832		
2,900.00	2,899.68	2,893.44	2,893.13	10.04	10.02	53.38	-161.62	-198.84	247.76	227.70	20.06	12.351		
3,000.00	2,899.37	2,893.31	2,892.76	10.37	10.36	53.37	-168.38	-197.16	245.76	225.04	20.72	11.860		
3,100.00	3,098.90	3,093.25	3,092.48	10.71	10.69	53.69	-175.14	-195.47	242.73	221.34	21.39	11.348		
3,200.00	3,198.36	3,193.17	3,192.13	11.04	11.02	54.16	-181.91	-193.78	239.18	217.12	22.06	10.842		
3,300.00	3,297.81	3,293.09	3,291.80	11.38	11.36	54.65	-188.67	-192.10	235.66	212.92	22.74	10.364		
3,400.00	3,397.26	3,393.00	3,391.48	11.73	11.70	55.15	-195.43	-190.41	232.15	208.73	23.42	9.912		
3,500.00	3,496.71	3,492.92	3,491.15	12.07	12.05	55.67	-202.20	-188.72	228.67	204.56	24.11	9.485		
3,600.00	3,596.17	3,592.84	3,590.83	12.42	12.39	56.21	-208.96	-187.04	225.20	200.40	24.80	9.081		
3,700.00	3,695.62	3,692.76	3,690.50	12.77	12.74	56.76	-215.72	-185.35	221.75	196.25	25.49	8.698		
3,800.00	3,795.07	3,792.67	3,790.18	13.13	13.08	57.33	-222.48	-183.67	218.32	192.13	26.19	8.336		
3,900.00	3,894.52	3,892.59	3,889.85	13.48	13.43	57.91	-229.25	-181.98	214.91	188.02	26.89	7.992		
4,000.00	3,893.97	3,892.51	3,889.52	13.84	13.78	58.52	-236.01	-180.29	211.53	183.94	27.60	7.665		
4,100.00	4,093.43	4,092.43	4,089.20	14.20	14.13	59.14	-242.77	-178.61	208.17	179.87	28.30	7.355		
4,200.00	4,192.88	4,192.34	4,188.87	14.56	14.48	59.79	-249.54	-176.92	204.84	175.83	29.01	7.060		
4,300.00	4,292.33	4,292.26	4,288.55	14.92	14.84	60.45	-256.30	-175.23	201.54	171.81	29.72	6.780		
4,400.00	4,391.78	4,392.18	4,388.22	15.28	15.19	61.14	-263.06	-173.55	198.26	167.82	30.44	6.513		
4,500.00	4,491.23	4,492.10	4,487.89	15.65	15.55	61.85	-269.82	-171.86	195.01	163.88	31.16	6.259		
4,600.00	4,590.69	4,592.01	4,587.57	16.01	15.90	62.59	-276.59	-170.18	191.80	159.92	31.88	6.017		
4,700.00	4,690.14	4,691.93	4,687.24	16.38	16.26	63.35	-283.35	-168.49	188.61	156.01	32.60	5.788		
4,800.00	4,789.59	4,791.85	4,786.92	16.75	16.61	64.14	-290.11	-166.80	185.46	152.14	33.32	5.566		
4,900.00	4,889.04	4,891.77	4,886.59	17.11	16.97	64.95	-296.88	-165.12	182.35	148.30	34.05	5.356		
5,000.00	4,988.50	4,991.68	4,986.26	17.48	17.33	65.79	-303.64	-163.43	179.27	144.50	34.77	5.155		
5,100.00	5,087.95	5,091.60	5,085.94	17.85	17.69	66.66	-310.40	-161.75	176.24	140.73	35.50	4.964		

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 738H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
5,200.00	5,187.40	5,191.52	5,185.61	18.22	18.05	67.56	-317.16	-160.06	173.24	137.01	38.23	4.781			
5,300.00	5,286.85	5,291.44	5,285.29	18.60	18.41	68.50	-323.93	-158.37	170.29	133.33	36.97	4.607			
5,400.00	5,386.30	5,391.35	5,384.98	18.97	18.77	69.46	-330.69	-156.69	167.39	129.69	37.70	4.440			
5,500.00	5,485.76	5,491.27	5,484.63	19.34	19.13	70.46	-337.45	-155.00	164.54	126.10	38.44	4.281			
5,600.00	5,585.21	5,591.19	5,584.31	19.72	19.49	71.49	-344.22	-153.31	161.74	122.56	39.17	4.129			
5,700.00	5,684.66	5,691.11	5,683.98	20.09	19.85	72.56	-350.98	-151.63	158.99	119.08	39.91	3.984			
5,800.00	5,784.11	5,791.02	5,783.66	20.46	20.22	73.67	-357.74	-149.94	156.30	115.65	40.65	3.845			
5,900.00	5,883.57	5,890.94	5,883.33	20.84	20.58	74.81	-364.50	-148.26	153.67	112.28	41.39	3.713			
6,000.00	5,983.02	5,990.85	5,983.05	21.21	20.94	76.27	-370.57	-146.74	151.11	108.98	42.13	3.587			
6,100.00	6,082.56	6,090.66	6,082.75	21.59	21.30	78.09	-374.95	-145.65	148.88	106.02	42.87	3.473			
6,200.00	6,182.25	6,190.39	6,182.44	21.96	21.65	79.98	-377.64	-144.98	147.24	103.64	43.59	3.377			
6,300.00	6,282.06	6,290.04	6,282.08	22.32	22.00	81.91	-378.65	-144.73	146.19	101.88	44.31	3.299			
6,400.00	6,381.96	6,389.92	6,381.96	22.68	22.34	83.60	-378.66	-144.73	145.63	100.63	45.01	3.236			
6,500.00	6,481.93	6,489.88	6,481.93	23.03	22.68	84.62	-378.66	-144.73	145.37	99.66	45.70	3.181			
6,600.00	6,581.92	6,589.88	6,581.92	23.38	23.02	85.04	-378.66	-144.73	145.29	98.90	46.39	3.132			
6,700.00	6,681.92	6,689.88	6,681.92	23.71	23.36	85.04	-378.66	-144.73	145.29	98.22	47.06	3.087			
6,800.00	6,781.92	6,789.88	6,781.92	24.04	23.71	85.04	-378.66	-144.73	145.29	97.55	47.74	3.043			
6,900.00	6,881.92	6,889.88	6,881.92	24.38	24.05	85.04	-378.66	-144.73	145.29	96.87	48.42	3.001			
7,000.00	6,981.92	6,989.88	6,981.92	24.72	24.39	85.04	-378.66	-144.73	145.29	96.19	49.10	2.959			
7,100.00	7,081.92	7,089.88	7,081.92	25.05	24.74	85.04	-378.66	-144.73	145.29	95.51	49.78	2.919			
7,200.00	7,181.92	7,189.88	7,181.92	25.39	25.08	85.04	-378.66	-144.73	145.29	94.83	50.46	2.879			
7,300.00	7,281.92	7,289.88	7,281.92	25.73	25.42	85.04	-378.66	-144.73	145.29	94.14	51.14	2.841			
7,400.00	7,381.92	7,389.88	7,381.92	26.07	25.77	85.04	-378.66	-144.73	145.29	93.46	51.83	2.803			
7,500.00	7,481.92	7,489.88	7,481.92	26.41	26.12	85.04	-378.66	-144.73	145.29	92.78	52.51	2.767			
7,600.00	7,581.92	7,589.88	7,581.92	26.75	26.46	85.04	-378.66	-144.73	145.29	92.09	53.20	2.731			
7,700.00	7,681.92	7,689.88	7,681.92	27.08	26.81	85.04	-378.66	-144.73	145.29	91.40	53.88	2.696			
7,800.00	7,781.92	7,789.88	7,781.92	27.43	27.15	85.04	-378.66	-144.73	145.29	90.72	54.57	2.662			
7,900.00	7,881.92	7,889.88	7,881.92	27.77	27.50	85.04	-378.66	-144.73	145.29	90.03	55.26	2.629			
8,000.00	7,981.92	7,989.88	7,981.92	28.11	27.85	85.04	-378.66	-144.73	145.29	89.34	55.95	2.597			
8,100.00	8,081.92	8,089.88	8,081.92	28.45	28.19	85.04	-378.66	-144.73	145.29	88.65	56.63	2.565			
8,200.00	8,181.92	8,189.88	8,181.92	28.79	28.54	85.04	-378.66	-144.73	145.29	87.96	57.32	2.534			
8,300.00	8,281.92	8,289.88	8,281.92	29.13	28.89	85.04	-378.66	-144.73	145.29	87.27	58.01	2.504			
8,400.00	8,381.92	8,389.88	8,381.92	29.48	29.24	85.04	-378.66	-144.73	145.29	86.58	58.71	2.475			
8,500.00	8,481.92	8,489.88	8,481.92	29.82	29.59	85.04	-378.66	-144.73	145.29	85.89	59.40	2.446			
8,600.00	8,581.92	8,589.88	8,581.92	30.16	29.93	85.04	-378.66	-144.73	145.29	85.20	60.09	2.418			
8,700.00	8,681.92	8,689.88	8,681.92	30.51	30.28	85.04	-378.66	-144.73	145.29	84.50	60.78	2.390			
8,800.00	8,781.92	8,789.88	8,781.92	30.85	30.63	85.04	-378.66	-144.73	145.29	83.81	61.48	2.363			
8,900.00	8,881.92	8,889.88	8,881.92	31.20	30.98	85.04	-378.66	-144.73	145.29	83.12	62.17	2.337			
9,000.00	8,981.92	8,989.88	8,981.92	31.54	31.33	85.04	-378.66	-144.73	145.29	82.42	62.88	2.311			
9,100.00	9,081.92	9,089.88	9,081.92	31.89	31.68	85.04	-378.66	-144.73	145.29	81.73	63.56	2.286			
9,200.00	9,181.92	9,189.88	9,181.92	32.23	32.03	85.04	-378.66	-144.73	145.29	81.03	64.25	2.261			
9,297.08	9,279.00	9,286.96	9,279.00	32.57	32.37	85.04	-378.66	-144.73	145.29	80.36	64.93	2.238			
9,300.00	9,281.92	9,289.88	9,281.92	32.58	32.38	87.04	-378.66	-144.73	145.29	80.34	64.95	2.237			
9,350.00	9,331.85	9,339.80	9,331.85	32.75	32.56	88.01	-378.66	-144.73	145.18	79.89	65.29	2.223			
9,389.97	9,371.48	9,379.44	9,371.48	32.88	32.69	90.00	-378.66	-144.73	145.09	79.53	65.56	2.213 CC			
9,400.00	9,381.37	9,389.33	9,381.37	32.91	32.73	90.66	-378.66	-144.73	145.10	79.47	65.63	2.211 ES			
9,450.00	9,430.11	9,438.07	9,430.11	33.06	32.90	94.85	-378.66	-144.73	145.65	79.71	65.95	2.209 SF			
9,500.00	9,477.71	9,485.66	9,477.71	33.21	33.07	100.28	-378.66	-144.73	147.78	81.53	66.25	2.231			
9,550.00	9,523.79	9,531.74	9,523.79	33.35	33.23	106.46	-378.66	-144.73	152.84	88.12	66.52	2.295			
9,600.00	9,568.01	9,575.96	9,568.01	33.48	33.36	112.82	-378.66	-144.73	161.41	94.65	66.76	2.418			
9,650.00	9,610.02	9,617.98	9,610.02	33.60	33.53	118.82	-378.66	-144.73	174.97	107.99	66.98	2.612			
9,700.00	9,649.52	9,657.48	9,649.52	33.72	33.67	124.02	-378.66	-144.73	193.76	126.58	67.18	2.884			

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 738H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
9,750.00	9,888.20	9,694.16	9,686.20	33.83	33.80	-128.21	-378.66	-144.73	217.75	150.39	67.37	3.232		
9,800.00	9,719.78	9,727.74	9,719.78	33.94	33.92	-131.28	-378.66	-144.73	246.60	179.07	67.53	3.652		
9,850.00	9,750.01	9,757.97	9,750.01	34.05	34.02	-133.19	-378.66	-144.73	279.77	212.09	67.68	4.134		
9,900.00	9,778.65	9,784.61	9,778.65	34.16	34.11	-133.88	-378.66	-144.73	316.69	248.88	67.81	4.670		
9,950.00	9,799.50	9,807.46	9,799.50	34.27	34.19	-133.20	-378.66	-144.73	356.79	288.87	67.92	5.253		
10,000.00	9,818.40	9,826.35	9,818.40	34.39	34.26	-130.86	-378.66	-144.73	399.51	331.50	68.00	5.875		
10,050.00	9,833.18	9,841.14	9,833.18	34.50	34.31	-126.31	-378.66	-144.73	444.33	376.26	68.07	6.528		
10,100.00	9,843.75	9,851.71	9,843.75	34.62	34.35	-118.58	-378.66	-144.73	490.77	422.66	68.11	7.205		
10,150.00	9,850.02	9,857.98	9,850.02	34.74	34.37	-106.34	-378.66	-144.73	538.34	470.20	68.14	7.901		
10,194.18	9,851.95	9,859.91	9,851.95	34.85	34.38	-91.12	-378.66	-144.73	580.95	512.81	68.14	8.525		
10,200.00	9,851.98	9,859.94	9,851.98	34.87	34.38	-91.14	-378.66	-144.73	586.59	518.45	68.15	8.608		
10,214.18	9,852.05	9,860.01	9,852.05	34.91	34.38	-91.16	-378.66	-144.73	600.34	532.20	68.15	8.810		
10,300.00	9,852.49	9,860.44	9,852.49	35.16	34.38	-91.55	-378.66	-144.73	684.19	616.04	68.15	10.040		
10,400.00	9,852.99	9,860.95	9,852.99	35.50	34.38	-92.23	-378.66	-144.73	782.95	714.80	68.16	11.488		
10,500.00	9,853.50	9,861.46	9,853.50	35.89	34.38	-93.54	-378.66	-144.73	882.39	814.23	68.16	12.945		
10,589.17	9,853.95	9,861.91	9,853.95	36.28	34.39	-96.47	-378.66	-144.73	971.39	903.21	68.17	14.249		
10,600.00	9,854.01	9,861.96	9,854.01	36.33	34.39	-96.54	-378.66	-144.73	982.20	914.03	68.17	14.407		
10,700.00	9,854.51	11,726.42	10,884.84	36.81	40.21	-177.85	701.49	-149.57	1,031.06	998.56	32.49	31.733		
10,800.00	9,855.02	11,826.42	10,884.96	37.35	40.72	-177.87	801.49	-150.02	1,030.66	997.39	33.27	30.979		
10,900.00	9,855.53	11,926.42	10,885.09	37.93	41.27	-177.89	901.48	-150.47	1,030.26	996.15	34.10	30.210		
11,000.00	9,856.03	12,026.42	10,885.21	38.56	41.87	-177.92	1,001.48	-150.92	1,029.86	994.87	34.99	29.436		
11,100.00	9,856.54	12,126.42	10,885.33	39.23	42.51	-177.94	1,101.48	-151.37	1,029.46	993.54	35.92	28.662		
11,200.00	9,857.04	12,226.42	10,885.45	39.94	43.18	-177.96	1,201.47	-151.82	1,029.06	992.17	36.89	27.895		
11,300.00	9,857.55	12,326.41	10,885.58	40.70	43.90	-177.98	1,301.47	-152.27	1,028.66	990.76	37.90	27.138		
11,400.00	9,858.06	12,426.41	10,885.70	41.49	44.65	-178.01	1,401.47	-152.71	1,028.26	989.31	38.95	26.396		
11,500.00	9,858.56	12,526.41	10,885.82	42.32	45.43	-178.03	1,501.47	-153.16	1,027.86	987.83	40.04	25.672		
11,600.00	9,859.07	12,626.41	10,885.94	43.18	46.25	-178.05	1,601.46	-153.61	1,027.47	986.31	41.15	24.966		
11,700.00	9,859.58	12,726.41	10,886.06	44.07	47.10	-178.08	1,701.46	-154.06	1,027.07	984.77	42.30	24.281		
11,800.00	9,860.08	12,826.41	10,886.19	44.99	47.98	-178.10	1,801.46	-154.51	1,026.67	983.20	43.47	23.618		
11,900.00	9,860.59	12,926.40	10,886.31	45.94	48.88	-178.12	1,901.46	-154.96	1,026.27	981.61	44.66	22.977		
12,000.00	9,861.09	13,026.40	10,886.43	46.92	49.82	-178.14	2,001.45	-155.41	1,025.88	979.99	45.88	22.359		
12,100.00	9,861.60	13,126.40	10,886.55	47.92	50.77	-178.17	2,101.45	-155.86	1,025.48	978.38	47.12	21.763		
12,200.00	9,862.11	13,226.40	10,886.67	48.94	51.75	-178.19	2,201.45	-156.30	1,025.08	976.70	48.38	21.189		
12,300.00	9,862.61	13,326.40	10,886.80	49.99	52.76	-178.21	2,301.45	-156.75	1,024.68	975.03	49.65	20.637		
12,400.00	9,863.12	13,426.40	10,886.92	51.05	53.78	-178.24	2,401.44	-157.20	1,024.29	973.34	50.94	20.106		
12,500.00	9,863.62	13,526.39	10,887.04	52.14	54.82	-178.26	2,501.44	-157.65	1,023.89	971.64	52.25	19.596		
12,600.00	9,864.13	13,626.39	10,887.16	53.24	55.88	-178.28	2,601.44	-158.10	1,023.49	969.92	53.57	19.105		
12,700.00	9,864.64	13,726.39	10,887.29	54.38	56.96	-178.31	2,701.43	-158.55	1,023.10	968.19	54.90	18.634		
12,800.00	9,865.14	13,826.39	10,887.41	55.49	58.06	-178.33	2,801.43	-159.00	1,022.70	966.45	56.25	18.181		
12,900.00	9,865.65	13,926.39	10,887.53	56.64	59.17	-178.35	2,901.43	-159.44	1,022.30	964.70	57.61	17.746		
13,000.00	9,866.15	14,026.39	10,887.65	57.81	60.29	-178.38	3,001.43	-159.89	1,021.91	962.93	58.97	17.328		
13,100.00	9,866.66	14,126.38	10,887.77	58.99	61.43	-178.40	3,101.42	-160.34	1,021.51	961.16	60.35	16.926		
13,200.00	9,867.17	14,226.38	10,887.90	60.17	62.58	-178.42	3,201.42	-160.79	1,021.12	959.38	61.74	16.540		
13,300.00	9,867.67	14,326.38	10,888.02	61.38	63.75	-178.44	3,301.42	-161.24	1,020.72	957.59	63.13	16.168		
13,400.00	9,868.18	14,426.38	10,888.14	62.59	64.93	-178.47	3,401.42	-161.69	1,020.33	955.79	64.54	15.810		
13,500.00	9,868.69	14,526.38	10,888.26	63.81	66.11	-178.49	3,501.41	-162.14	1,019.93	953.99	65.95	15.466		
13,600.00	9,869.19	14,626.38	10,888.39	65.04	67.31	-178.51	3,601.41	-162.59	1,019.54	952.17	67.36	15.135		
13,700.00	9,869.70	14,726.37	10,888.51	66.28	68.52	-178.54	3,701.41	-163.03	1,019.14	950.36	68.79	14.816		
13,800.00	9,870.20	14,826.37	10,888.63	67.53	69.74	-178.56	3,801.40	-163.48	1,018.75	948.53	70.22	14.509		
13,900.00	9,870.71	14,926.37	10,888.75	68.79	70.97	-178.58	3,901.40	-163.93	1,018.35	946.70	71.65	14.213		
14,000.00	9,871.22	15,026.37	10,888.87	70.06	72.20	-178.61	4,001.40	-164.38	1,017.96	944.87	73.09	13.927		
14,100.00	9,871.72	15,126.37	10,889.00	71.33	73.45	-178.63	4,101.40	-164.83	1,017.56	943.03	74.54	13.652		

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

Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 738H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,200.00	9,872.23	15,226.37	10,889.12	72.61	74.70	-178.65	4,201.39	-165.28	1,017.17	941.18	75.99	13.388	
14,300.00	9,872.73	15,326.36	10,889.24	73.90	75.96	-178.68	4,301.39	-165.73	1,016.78	939.33	77.44	13.129	
14,400.00	9,873.24	15,426.36	10,889.36	75.19	77.22	-178.70	4,401.39	-166.18	1,016.38	937.48	78.90	12.881	
14,500.00	9,873.75	15,526.36	10,889.48	76.49	78.50	-178.72	4,501.39	-166.62	1,015.99	935.62	80.37	12.642	
14,600.00	9,874.25	15,626.36	10,889.61	77.80	79.77	-178.75	4,601.38	-167.07	1,015.60	933.76	81.84	12.410	
14,700.00	9,874.76	15,726.36	10,889.73	79.11	81.06	-178.77	4,701.38	-167.52	1,015.20	931.90	83.31	12.186	
14,800.00	9,875.27	15,826.36	10,889.85	80.43	82.35	-178.79	4,801.38	-167.97	1,014.81	930.03	84.78	11.970	
14,900.00	9,875.77	15,926.36	10,889.97	81.75	83.65	-178.82	4,901.37	-168.42	1,014.42	928.16	86.26	11.760	
15,000.00	9,876.28	16,026.35	10,890.10	83.07	84.95	-178.84	5,001.37	-168.87	1,014.03	926.28	87.74	11.557	
15,100.00	9,876.78	16,126.35	10,890.22	84.40	86.25	-178.87	5,101.37	-169.32	1,013.63	924.41	89.23	11.360	
15,200.00	9,877.29	16,226.35	10,890.34	85.73	87.56	-178.89	5,201.37	-169.77	1,013.24	922.53	90.71	11.170	
15,300.00	9,877.80	16,326.35	10,890.46	87.07	88.88	-178.91	5,301.36	-170.21	1,012.85	920.65	92.20	10.985	
15,400.00	9,878.30	16,426.35	10,890.58	88.41	90.20	-178.94	5,401.36	-170.66	1,012.46	918.76	93.69	10.806	
15,500.00	9,878.81	16,526.35	10,890.71	89.76	91.52	-178.96	5,501.36	-171.11	1,012.07	916.88	95.19	10.632	
15,600.00	9,879.31	16,626.34	10,890.83	91.11	92.85	-178.98	5,601.36	-171.56	1,011.67	914.99	96.69	10.464	
15,700.00	9,879.82	16,726.34	10,890.95	92.46	94.18	-179.01	5,701.35	-172.01	1,011.28	913.10	98.18	10.300	
15,800.00	9,880.33	16,826.34	10,891.07	93.82	95.52	-179.03	5,801.35	-172.46	1,010.89	911.21	99.69	10.141	
15,900.00	9,880.83	16,926.34	10,891.20	95.17	96.86	-179.05	5,901.35	-172.91	1,010.50	909.31	101.19	9.986	
16,000.00	9,881.34	17,026.34	10,891.32	96.54	98.20	-179.08	6,001.34	-173.36	1,010.11	907.42	102.69	9.836	
16,100.00	9,881.85	17,126.34	10,891.44	97.90	99.55	-179.10	6,101.34	-173.80	1,009.72	905.52	104.20	9.690	
16,200.00	9,882.35	17,226.33	10,891.56	99.27	100.90	-179.13	6,201.34	-174.25	1,009.33	903.62	105.71	9.548	
16,300.00	9,882.86	17,326.33	10,891.68	100.64	102.25	-179.15	6,301.34	-174.70	1,008.94	901.72	107.22	9.410	
16,400.00	9,883.36	17,426.33	10,891.81	102.01	103.60	-179.17	6,401.33	-175.15	1,008.55	899.82	108.73	9.275	
16,500.00	9,883.87	17,526.33	10,891.93	103.38	104.96	-179.20	6,501.33	-175.60	1,008.16	897.91	110.25	9.145	
16,600.00	9,884.38	17,626.33	10,892.05	104.76	106.32	-179.22	6,601.33	-176.05	1,007.77	896.01	111.76	9.017	
16,700.00	9,884.88	17,726.33	10,892.17	106.14	107.68	-179.24	6,701.33	-176.50	1,007.38	894.10	113.28	8.893	
16,800.00	9,885.39	17,826.32	10,892.29	107.52	109.05	-179.27	6,801.32	-176.94	1,006.99	892.19	114.80	8.772	
16,900.00	9,885.89	17,926.32	10,892.42	108.90	110.41	-179.29	6,901.32	-177.39	1,006.60	890.28	116.32	8.654	
17,000.00	9,886.40	18,026.32	10,892.54	110.29	111.78	-179.32	7,001.32	-177.84	1,006.21	888.37	117.84	8.539	
17,100.00	9,886.91	18,126.32	10,892.66	111.68	113.16	-179.34	7,101.31	-178.29	1,005.82	886.46	119.36	8.427	
17,200.00	9,887.41	18,226.32	10,892.78	113.06	114.53	-179.36	7,201.31	-178.74	1,005.43	884.55	120.88	8.318	
17,300.00	9,887.92	18,326.32	10,892.91	114.46	115.91	-179.39	7,301.31	-179.19	1,005.04	882.64	122.41	8.211	
17,400.00	9,888.43	18,426.31	10,893.03	115.85	117.28	-179.41	7,401.31	-179.64	1,004.66	880.73	123.93	8.107	
17,500.00	9,888.93	18,526.31	10,893.15	117.24	118.66	-179.44	7,501.30	-180.09	1,004.27	878.81	125.46	8.005	
17,600.00	9,889.44	18,626.31	10,893.27	118.64	120.04	-179.46	7,601.30	-180.53	1,003.88	876.89	126.99	7.905	
17,700.00	9,889.94	18,726.31	10,893.39	120.03	121.43	-179.48	7,701.30	-180.98	1,003.49	874.98	128.51	7.808	
17,800.00	9,890.45	18,826.31	10,893.52	121.43	122.81	-179.51	7,801.30	-181.43	1,003.10	873.06	130.04	7.714	
17,900.00	9,890.96	18,926.31	10,893.64	122.83	124.20	-179.53	7,901.29	-181.88	1,002.72	871.14	131.57	7.621	
18,000.00	9,891.46	19,026.30	10,893.76	124.23	125.59	-179.56	8,001.29	-182.33	1,002.33	869.22	133.10	7.530	
18,100.00	9,891.97	19,126.30	10,893.88	125.64	126.98	-179.58	8,101.29	-182.78	1,001.94	867.31	134.64	7.442	
18,200.00	9,892.47	19,226.30	10,894.00	127.04	128.37	-179.60	8,201.28	-183.23	1,001.56	865.39	136.17	7.355	
18,300.00	9,892.98	19,326.30	10,894.13	128.44	129.76	-179.63	8,301.28	-183.68	1,001.17	863.46	137.70	7.270	
18,400.00	9,893.49	19,426.30	10,894.25	129.85	131.16	-179.65	8,401.28	-184.12	1,000.78	861.54	139.24	7.188	
18,500.00	9,893.99	19,526.30	10,894.37	131.26	132.55	-179.68	8,501.28	-184.57	1,000.40	859.62	140.77	7.106	
18,600.00	9,894.50	19,626.29	10,894.49	132.67	133.95	-179.70	8,601.27	-185.02	1,000.01	857.70	142.31	7.027	
18,700.00	9,895.01	19,726.29	10,894.62	134.08	135.35	-179.72	8,701.27	-185.47	999.62	855.78	143.85	6.949	
18,800.00	9,895.51	19,826.29	10,894.74	135.49	136.75	-179.75	8,801.27	-185.92	999.24	853.85	145.39	6.873	
18,900.00	9,896.02	19,926.29	10,894.86	136.90	138.15	-179.77	8,901.27	-186.37	998.85	851.93	146.92	6.798	
19,000.00	9,896.52	20,026.29	10,894.98	138.31	139.55	-179.80	9,001.26	-186.82	998.47	850.00	148.46	6.725	
19,100.00	9,897.03	20,126.29	10,895.10	139.73	140.95	-179.82	9,101.26	-187.27	998.08	848.08	150.00	6.654	
19,200.00	9,897.54	20,226.28	10,895.23	141.14	142.36	-179.85	9,201.26	-187.71	997.70	846.15	151.54	6.584	
19,300.00	9,898.04	20,326.28	10,895.35	142.56	143.76	-179.87	9,301.26	-188.16	997.31	844.23	153.08	6.515	

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



Scientific Drilling, Intl
Anticollision Report



Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Offset Design Spud Muffin 31-30 - 738H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,400.00	9,898.55	20,426.28	10,895.47	143.97	145.17	-179.89	9,401.25	-188.61	996.93	842.30	154.63	6.447	
19,500.00	9,899.05	20,526.28	10,895.59	145.39	146.57	-179.92	9,501.25	-189.06	996.54	840.37	156.17	6.381	
19,600.00	9,899.56	20,626.28	10,895.72	146.81	147.98	-179.94	9,601.25	-189.51	996.16	838.45	157.71	6.316	
19,700.00	9,900.07	20,726.28	10,895.84	148.23	149.39	-179.97	9,701.24	-189.96	995.77	836.52	159.25	6.253	
19,800.00	9,900.57	20,826.27	10,895.96	149.65	150.80	-179.99	9,801.24	-190.41	995.39	834.59	160.80	6.190	
19,831.98	9,901.00	20,858.25	10,896.00	150.10	151.25	-180.00	9,833.22	-190.55	995.00	833.71	161.29	6.169	
19,832.96	9,901.01	20,859.24	10,896.00	150.11	151.27	-180.00	9,834.20	-190.55	995.00	833.70	161.30	6.169	

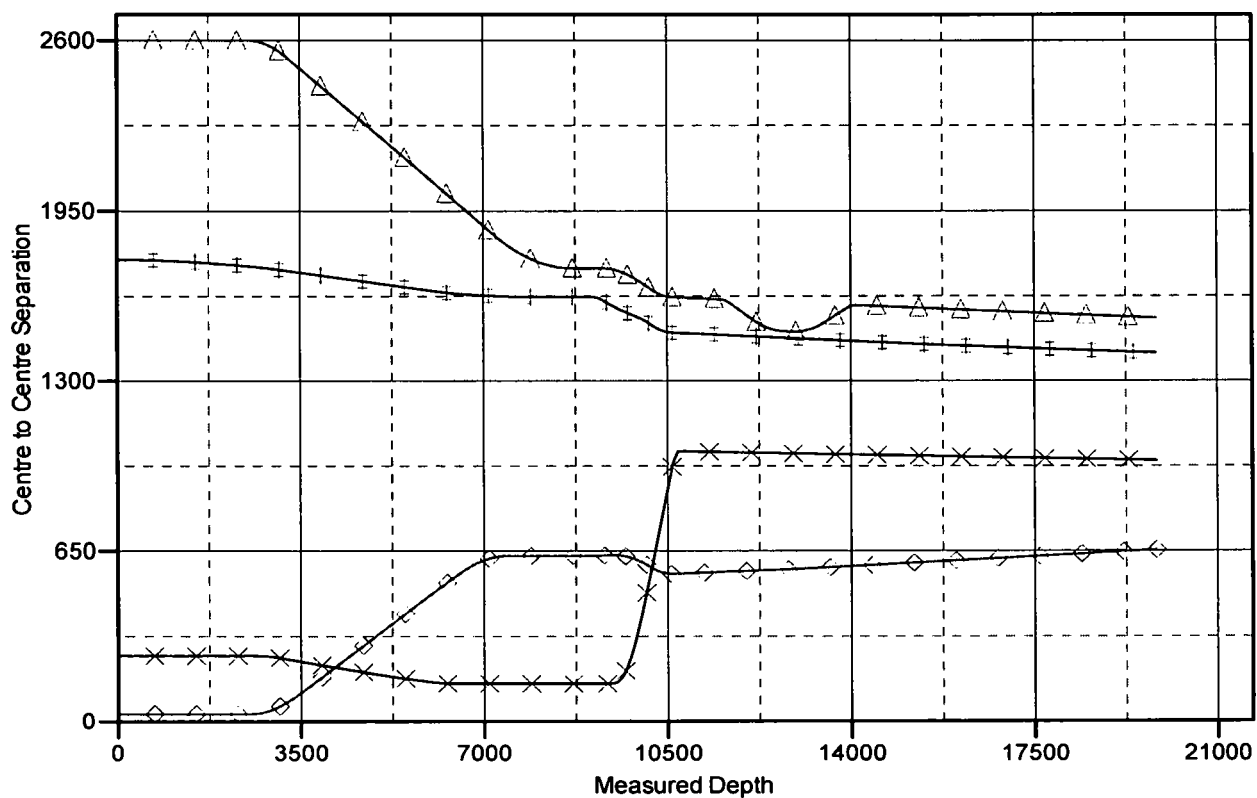
Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB = 32' @ 2992.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 624H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Grid Convergence at Surface is: 0.17°

Ladder Plot



LEGEND

- ◆ 334H, OH, Plan #1 V0
- ✕ 738H, OH, Plan #1 V0
- 332H (Leam), OH, Planned V0
- ▲ 623H (Leam), OH, Planned V0

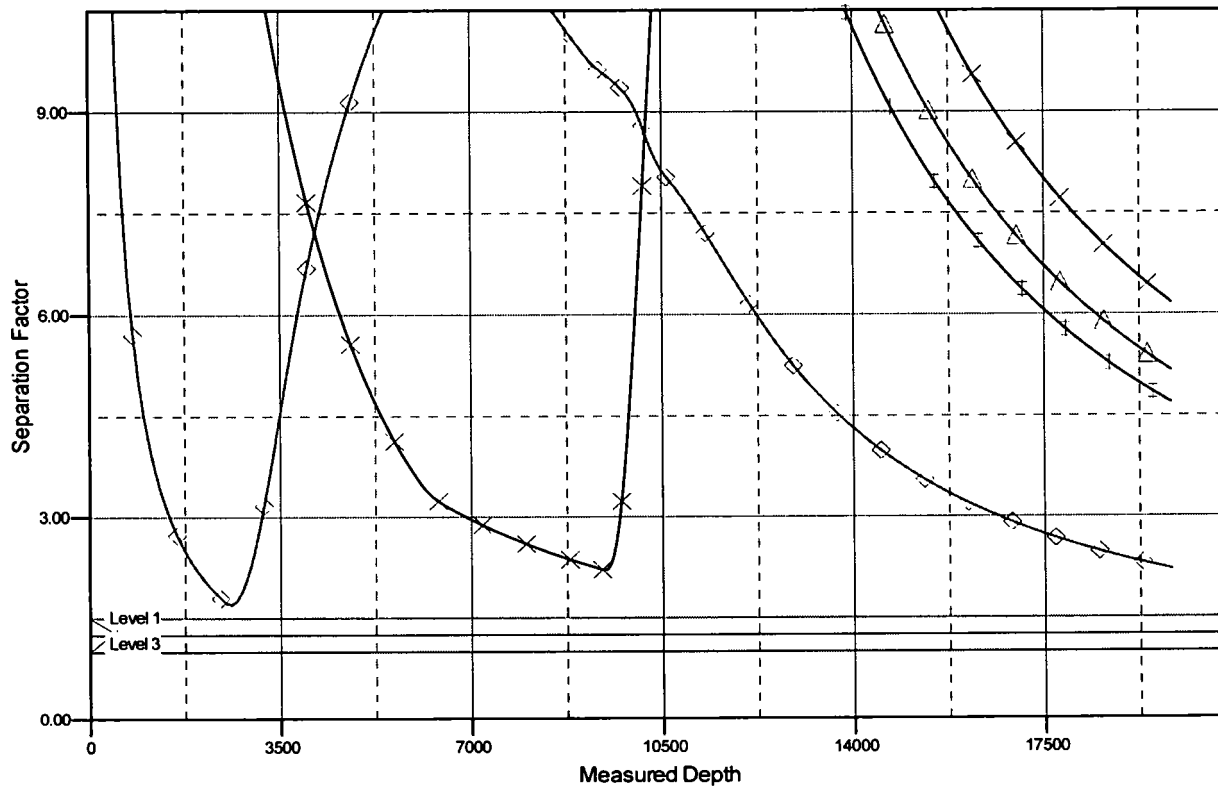
Company: Devon Energy
Project: Eddy County, NM (NAD83 NME)
Reference Site: Spud Muffin 31-30
Site Error: 0.00 usft
Reference Well: 624H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 624H
TVD Reference: KB = 32' @ 2992.00usft
MD Reference: KB = 32' @ 2992.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB = 32' @ 2992.00usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 624H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Grid Convergence at Surface is: 0.17°

Separation Factor Plot



LEGEND

- ◆ 334H, OH, Plan #1 V0
- ◆ 738H, OH, Plan #1 V0
- ◆ 332H (Learn), OH, Planned V0
- ◆ 623H (Learn), OH, Planned V0