



PHOENIX
TECHNOLOGY SERVICES

Apache Corporation
Lea County, NM (NAD83 NME)
Black & Tan 27 Federal Com
305H

OH / 62390
Surveys (H&P 482)

Anticollision Report

19 March, 2018

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Reference	Surveys (H&P 482)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 50,000.00 u	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Program	Date 3/19/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
69.24	10,521.00	VES Gyro Surveys (OH / 62390)	NS-GYRO-MS	North sensing gyrocompassing m/s
10,521.00	15,859.00	Phoenix MWD Surveys (OH / 62390)	MWD+HDGM	OWSG Rev.2 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						
API 30-025-08464						
Well #1 - OH - Assumed Surveys	3,738.75	3,341.00	59.70	45.48	4.199	CC, ES, SF
Black & Tan 27 Federal Com						
102 H - OH - Plan 1 08-29-17	9,226.74	9,200.00	935.96	893.63	22.110	CC, ES
102 H - OH - Plan 1 08-29-17	15,859.00	14,193.70	1,772.20	1,663.82	16.352	SF
103H - OH - Plan 1 09-05-17	3,666.71	3,666.64	63.13	47.16	3.953	CC
103H - OH - Plan 1 09-05-17	5,900.00	5,899.84	68.48	42.43	2.628	ES, SF
202 H - OH - Plan 1 08-29-17	8,257.95	8,248.58	981.30	943.81	26.173	CC, ES
202 H - OH - Plan 1 08-29-17	15,859.00	15,092.08	1,265.50	1,129.29	9.291	SF
203H - OH - Plan 1 09-05-17	5,476.78	5,476.62	48.52	24.35	2.008	CC
203H - OH - Plan 1 09-05-17	5,900.00	5,899.84	49.81	23.75	1.912	ES, SF
303H - OH / Job #61822 - Surveys (H&P 482)	11,015.33	10,974.21	950.98	910.68	23.602	CC, ES
303H - OH / Job #61822 - Surveys (H&P 482)	11,100.00	11,037.34	953.04	912.53	23.524	SF
303H - ST01 / Job #61822 - Surveys (H&P 482)	11,400.42	11,354.34	915.10	873.44	21.965	CC
303H - ST01 / Job #61822 - Surveys (H&P 482)	15,859.00	15,791.00	915.83	770.30	6.293	ES, SF
403H - OH - Plan 1 08-29-17	10,748.99	10,748.32	888.11	844.18	20.217	CC
403H - OH - Plan 1 08-29-17	15,859.00	16,117.05	947.44	803.57	6.585	ES, SF
404H - OH - Plan 1 09-05-17	6,400.00	6,399.46	23.12	-0.26	0.990	Level 1, CC
404H - OH - Plan 1 09-05-17	11,019.75	10,978.87	89.70	-10.42	0.782	Level 1, ES, SF
405H - OH - Plan 1 09-05-17	3,140.36	3,140.30	33.10	19.24	2.388	CC
405H - OH - Plan 1 09-05-17	3,600.00	3,599.93	33.88	18.19	2.159	ES
405H - OH - Plan 1 09-05-17	5,900.00	5,899.68	48.04	22.00	1.845	SF
503H - OH - Plan 1 09-05-17	6,704.96	6,707.99	41.38	18.46	1.438	Level 2, CC, ES, SF
Gulf						
Federal - OH - Assumed Surveys	3,119.43	3,101.99	180.46	83.36	1.858	CC
Federal - OH - Assumed Surveys	3,361.22	3,341.00	180.64	76.03	1.727	ES, SF
Keohane A						
1 - OH - Assumed Surveys	3,132.68	3,113.22	485.92	388.46	4.985	CC
1 - OH - Assumed Surveys	3,700.00	3,681.88	486.57	371.29	4.221	ES, SF

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design													API 30-025-08464 - Well #1 - OH - Assumed Surveys		Offset Site Error: 0.00 usft	
Survey Program: 0-MWD													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Distance						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)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	400.00	0.00	0.00	48.40	116.03	130.71	436.52							
100.00	100.00	0.00	400.00	0.14	0.00	-136.85	116.03	130.71	347.23	346.10	1.14	305.798				
200.00	200.00	0.00	400.00	0.40	0.00	-145.73	116.03	130.71	265.78	264.76	1.02	260.413				
300.00	300.00	0.00	400.00	0.66	0.00	-138.38	116.03	130.71	201.85	200.98	0.87	233.173				
400.00	400.00	0.00	400.00	0.91	0.00	-167.88	116.03	130.71	175.55	174.64	0.91	192.025				
439.98	439.98	42.55	442.54	1.01	0.05	-162.60	115.78	130.52	175.36	174.30	1.06	165.331				
500.00	500.00	106.00	505.97	1.16	0.14	-157.13	114.49	129.51	174.01	172.72	1.30	134.338				
600.00	600.00	205.95	605.86	1.42	0.39	-142.65	111.74	127.36	170.90	169.12	1.77	96.289				
700.00	700.00	305.89	705.75	1.68	0.65	-146.75	109.00	125.21	167.69	165.42	2.27	74.011				
800.00	800.00	405.85	805.64	1.95	0.90	-144.67	106.25	123.06	164.59	161.83	2.76	59.683				
900.00	900.00	505.79	905.53	2.21	1.15	-158.10	103.50	120.92	161.41	158.16	3.25	49.683				
1,000.00	1,000.00	605.74	1,005.41	2.47	1.40	-155.91	100.75	118.77	158.25	154.51	3.74	42.321				
1,100.00	1,100.00	705.69	1,105.30	2.73	1.66	-177.99	98.00	116.62	155.02	150.80	4.22	36.716				
1,200.00	1,200.00	805.63	1,205.18	2.98	1.91	-164.66	95.25	114.47	151.75	147.05	4.70	32.262				
1,300.00	1,299.99	905.58	1,305.07	3.24	2.16	-165.37	92.50	112.33	148.53	143.34	5.19	28.600				
1,400.00	1,399.99	1,005.53	1,404.96	3.50	2.42	-168.08	89.76	110.18	145.39	139.71	5.68	25.585				
1,500.00	1,499.99	1,105.48	1,504.84	3.77	2.67	-167.27	87.01	108.03	142.31	136.14	6.17	23.057				
1,600.00	1,599.99	1,205.43	1,604.73	4.02	2.92	-172.44	84.26	105.88	139.24	132.58	6.66	20.904				
1,700.00	1,699.99	1,305.38	1,704.62	4.24	3.17	143.33	81.51	103.74	136.09	128.99	7.11	19.147				
1,800.00	1,799.99	1,405.31	1,804.49	4.32	3.43	38.52	78.76	101.59	132.49	125.08	7.41	17.875				
1,900.00	1,899.99	1,505.23	1,904.35	4.31	3.68	29.18	76.01	99.44	128.64	121.01	7.64	16.846				
2,000.00	1,999.99	1,605.15	2,004.21	4.32	3.93	31.31	73.27	97.30	124.81	116.94	7.87	15.850				
2,100.00	2,099.99	1,705.06	2,104.06	4.34	4.18	33.17	70.52	95.15	120.93	112.80	8.13	14.874				
2,200.00	2,199.99	1,804.98	2,203.92	4.38	4.44	22.12	67.77	93.00	117.04	108.64	8.40	13.930				
2,300.00	2,299.99	1,904.91	2,303.79	4.45	4.69	-15.25	65.02	90.85	113.31	104.61	8.70	13.018				
2,400.00	2,399.98	2,004.84	2,403.66	4.57	4.94	-50.95	62.27	88.71	109.72	100.67	9.05	12.119				
2,500.00	2,499.98	2,104.77	2,503.53	4.71	5.19	-24.66	59.53	86.56	106.07	96.65	9.42	11.260				
2,600.00	2,599.98	2,204.69	2,603.39	4.83	5.45	-23.03	56.78	84.41	102.18	92.40	9.78	10.450				
2,700.00	2,699.98	2,304.60	2,703.24	4.96	5.70	-15.64	54.03	82.27	98.05	87.91	10.14	9.669				
2,800.00	2,799.97	2,404.50	2,803.08	5.11	5.95	-25.40	51.28	80.12	93.61	83.10	10.52	8.902				
2,900.00	2,899.96	2,504.39	2,902.91	5.26	6.20	-18.32	48.54	77.97	89.02	78.12	10.90	8.165				
3,000.00	2,999.95	2,604.27	3,002.73	5.43	6.46	-29.02	45.79	75.83	84.17	72.87	11.30	7.448				
3,100.00	3,099.94	2,704.19	3,102.59	5.62	6.71	-88.75	43.04	73.68	80.16	68.43	11.73	6.835				
3,200.00	3,199.94	2,804.14	3,202.47	5.80	6.96	134.35	40.29	71.53	77.21	65.07	12.14	6.359				
3,300.00	3,299.94	2,904.07	3,302.34	5.92	7.22	78.40	37.54	69.39	74.03	61.51	12.51	5.916				
3,400.00	3,399.93	3,003.99	3,402.20	6.04	7.47	59.86	34.80	67.24	70.49	57.62	12.88	5.474				
3,500.00	3,499.93	3,103.91	3,502.06	6.17	7.72	55.61	32.05	65.09	66.95	53.70	13.25	5.051				
3,600.00	3,599.93	3,203.83	3,601.92	6.30	7.97	86.96	29.30	62.95	63.49	49.84	13.65	4.652				
3,700.00	3,699.93	3,303.77	3,701.79	6.45	8.23	138.53	26.55	60.80	60.68	46.62	14.06	4.317				
3,738.75	3,738.68	3,341.00	3,739.01	6.52	8.32	145.37	25.53	60.00	59.70	45.48	14.22	4.199	CC, ES, SF			
3,800.00	3,799.92	3,341.00	3,739.01	6.62	8.32	153.16	25.53	60.00	85.55	75.21	10.35	8.269				
3,900.00	3,899.92	3,341.00	3,739.01	6.79	8.32	159.92	25.53	60.00	172.04	165.74	6.31	27.278				
4,000.00	3,999.92	3,341.00	3,739.01	6.97	8.32	143.39	25.53	60.00	268.12	262.92	5.20	51.548				
4,100.00	4,099.91	3,341.00	3,739.01	7.15	8.32	139.07	25.53	60.00	366.28	361.47	4.81	76.175				
4,200.00	4,199.90	3,341.00	3,739.01	7.34	8.32	148.72	25.53	60.00	465.25	460.60	4.65	100.033				
4,300.00	4,299.90	3,341.00	3,739.01	7.53	8.32	-88.41	25.53	60.00	564.55	559.96	4.58	123.182				
4,400.00	4,399.90	3,341.00	3,739.01	7.71	8.32	127.14	25.53	60.00	664.03	659.47	4.56	145.604				
4,500.00	4,499.89	3,341.00	3,739.01	7.89	8.32	118.70	25.53	60.00	763.67	759.11	4.57	167.217				
4,600.00	4,599.89	3,341.00	3,739.01	8.08	8.32	123.29	25.53	60.00	863.39	858.80	4.59	188.186				
4,700.00	4,699.88	3,341.00	3,739.01	8.27	8.32	115.54	25.53	60.00	963.16	958.54	4.62	208.527				
4,800.00	4,799.88	3,341.00	3,739.01	8.45	8.32	-127.95	25.53	60.00	1,062.97	1,058.32	4.66	228.295				
4,900.00	4,899.87	3,341.00	3,739.01	8.65	8.32	116.05	25.53	60.00	1,162.82	1,158.12	4.70	247.431				

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
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Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design API 30-025-08464 - Well #1 - OH - Assumed Surveys													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													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)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.00	4,999.87	3,341.00	3,739.01	8.84	8.32	112.97	25.53	60.00	1,262.69	1,257.95	4.75	265.974	
5,100.00	5,099.86	3,341.00	3,739.01	9.03	8.32	113.13	25.53	60.00	1,362.58	1,357.78	4.80	283.953	
5,200.00	5,199.86	3,341.00	3,739.01	9.23	8.32	97.45	25.53	60.00	1,462.48	1,457.63	4.85	301.367	
5,300.00	5,299.85	3,341.00	3,739.01	9.42	8.32	106.10	25.53	60.00	1,562.39	1,557.48	4.91	318.233	
5,400.00	5,399.85	3,341.00	3,739.01	9.63	8.32	133.57	25.53	60.00	1,662.32	1,657.35	4.97	334.536	
5,500.00	5,499.85	3,341.00	3,739.01	9.85	8.32	166.42	25.53	60.00	1,762.25	1,757.22	5.03	350.330	
5,600.00	5,599.85	3,341.00	3,739.01	10.03	8.32	-50.36	25.53	60.00	1,862.18	1,857.08	5.09	365.618	
5,700.00	5,699.84	3,341.00	3,739.01	10.19	8.32	-101.74	25.53	60.00	1,962.10	1,956.94	5.16	380.391	
5,800.00	5,799.84	3,341.00	3,739.01	10.37	8.32	-113.51	25.53	60.00	2,062.05	2,056.82	5.23	394.627	
5,900.00	5,899.84	3,341.00	3,739.01	10.56	8.32	-110.94	25.53	60.00	2,162.00	2,156.70	5.29	408.360	
6,000.00	5,999.83	3,341.00	3,739.01	10.76	8.32	-65.65	25.53	60.00	2,261.96	2,256.59	5.37	421.596	
6,100.00	6,099.75	3,341.00	3,739.01	10.96	8.32	-43.10	25.53	60.00	2,361.91	2,356.47	5.44	434.341	
6,200.00	6,199.65	3,341.00	3,739.01	11.16	8.32	-45.03	25.53	60.00	2,461.85	2,456.34	5.51	446.600	
6,300.00	6,299.55	3,341.00	3,739.01	11.37	8.32	-44.47	25.53	60.00	2,561.80	2,556.21	5.59	458.388	
6,400.00	6,399.46	3,341.00	3,739.01	11.58	8.32	-49.08	25.53	60.00	2,661.76	2,656.09	5.67	469.722	
6,500.00	6,499.38	3,341.00	3,739.01	11.79	8.32	-57.00	25.53	60.00	2,761.73	2,755.98	5.75	480.614	
6,600.00	6,599.32	3,341.00	3,739.01	12.01	8.32	-64.48	25.53	60.00	2,861.70	2,855.88	5.83	491.078	
6,700.00	6,699.26	3,341.00	3,739.01	12.22	8.32	-55.07	25.53	60.00	2,961.67	2,955.76	5.91	501.128	
6,800.00	6,799.17	3,341.00	3,739.01	12.44	8.32	-43.12	25.53	60.00	3,061.64	3,055.65	5.99	510.758	
6,900.00	6,899.07	3,341.00	3,739.01	12.66	8.32	-42.20	25.53	60.00	3,161.61	3,155.53	6.08	519.980	
7,000.00	6,998.97	3,341.00	3,739.01	12.88	8.32	-40.21	25.53	60.00	3,261.58	3,255.41	6.17	528.815	
7,100.00	7,098.86	3,341.00	3,739.01	13.11	8.32	-39.69	25.53	60.00	3,361.55	3,355.30	6.26	537.264	
7,200.00	7,198.77	3,341.00	3,739.01	13.34	8.32	-46.78	25.53	60.00	3,461.53	3,455.19	6.35	545.348	
7,300.00	7,298.67	3,341.00	3,739.01	13.56	8.32	-39.14	25.53	60.00	3,561.50	3,555.07	6.44	553.086	
7,400.00	7,398.55	3,341.00	3,739.01	13.78	8.32	-45.03	25.53	60.00	3,661.46	3,654.92	6.53	560.476	
7,500.00	7,498.44	3,341.00	3,739.01	14.01	8.32	-30.39	25.53	60.00	3,761.43	3,754.80	6.63	567.519	
7,600.00	7,598.30	3,341.00	3,739.01	14.25	8.32	-25.51	25.53	60.00	3,861.39	3,854.67	6.72	574.232	
7,700.00	7,698.13	3,341.00	3,739.01	14.48	8.32	-21.56	25.53	60.00	3,961.35	3,954.53	6.82	580.622	
7,800.00	7,797.98	3,341.00	3,739.01	14.72	8.32	-27.77	25.53	60.00	4,061.32	4,054.40	6.92	586.701	
7,900.00	7,897.86	3,341.00	3,739.01	14.96	8.32	-39.63	25.53	60.00	4,161.30	4,154.27	7.02	592.486	
8,000.00	7,997.77	3,341.00	3,739.01	15.19	8.32	-67.79	25.53	60.00	4,261.29	4,254.16	7.13	597.992	
8,100.00	8,097.70	3,341.00	3,739.01	15.43	8.32	-67.47	25.53	60.00	4,361.28	4,354.05	7.23	603.222	
8,200.00	8,197.64	3,341.00	3,739.01	15.67	8.32	-70.55	25.53	60.00	4,461.27	4,453.94	7.34	608.184	
8,300.00	8,297.56	3,341.00	3,739.01	15.91	8.32	-52.10	25.53	60.00	4,561.26	4,553.82	7.44	612.889	
8,400.00	8,397.45	3,341.00	3,739.01	16.15	8.32	-39.67	25.53	60.00	4,661.23	4,653.68	7.55	617.340	
8,500.00	8,497.32	3,341.00	3,739.01	16.38	8.32	-39.18	25.53	60.00	4,761.20	4,753.54	7.66	621.545	
8,600.00	8,597.19	3,341.00	3,739.01	16.62	8.32	-40.89	25.53	60.00	4,861.16	4,853.39	7.77	625.514	
8,700.00	8,697.07	3,341.00	3,739.01	16.85	8.32	-45.17	25.53	60.00	4,961.13	4,953.24	7.88	629.257	
8,800.00	8,796.96	3,341.00	3,739.01	17.09	8.32	-49.92	25.53	60.00	5,061.10	5,053.10	8.00	632.781	
8,900.00	8,896.87	3,341.00	3,739.01	17.33	8.32	-69.80	25.53	60.00	5,161.08	5,152.97	8.11	636.092	
9,000.00	8,996.80	3,341.00	3,739.01	17.57	8.32	-84.35	25.53	60.00	5,261.08	5,252.84	8.23	639.202	
9,100.00	9,096.75	3,341.00	3,739.01	17.82	8.32	-170.33	25.53	60.00	5,361.07	5,352.72	8.35	642.118	
9,200.00	9,196.70	3,341.00	3,739.01	18.06	8.32	90.92	25.53	60.00	5,461.07	5,452.60	8.47	644.845	
9,300.00	9,296.64	3,341.00	3,739.01	18.30	8.32	68.89	25.53	60.00	5,561.06	5,552.47	8.59	647.386	
9,400.00	9,396.58	3,341.00	3,739.01	18.54	8.32	121.50	25.53	60.00	5,661.05	5,652.34	8.71	649.744	
9,500.00	9,496.53	3,341.00	3,739.01	18.79	8.32	-156.72	25.53	60.00	5,761.05	5,752.21	8.84	651.938	
9,600.00	9,596.47	3,341.00	3,739.01	19.03	8.32	-57.51	25.53	60.00	5,861.04	5,852.08	8.96	653.967	
9,700.00	9,696.39	3,341.00	3,739.01	19.27	8.32	-71.03	25.53	60.00	5,961.02	5,951.93	9.09	655.839	
9,800.00	9,796.32	3,341.00	3,739.01	19.51	8.32	-59.06	25.53	60.00	6,061.00	6,051.79	9.22	657.557	
9,900.00	9,896.23	3,341.00	3,739.01	19.75	8.32	-54.59	25.53	60.00	6,160.99	6,151.64	9.35	659.129	
10,000.00	9,996.15	3,341.00	3,739.01	20.00	8.32	-62.70	25.53	60.00	6,260.97	6,251.49	9.48	660.560	
10,100.00	10,096.08	3,341.00	3,739.01	20.25	8.32	-99.25	25.53	60.00	6,360.96	6,351.35	9.61	661.856	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design														Offset Site Error:	0.00 usft
Survey Program: 0-MWD														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		
10,200.00	10,196.03	3,341.00	3,739.01	20.49	8.32	113.87	25.53	60.00	6,460.96	6,451.22	9.74	663.023			
10,300.00	10,296.00	3,341.00	3,739.01	20.71	8.32	80.54	25.53	60.00	6,560.94	6,551.06	9.88	664.069			
10,400.00	10,395.97	3,341.00	3,739.01	20.89	8.32	57.44	25.53	60.00	6,660.87	6,650.85	10.02	664.993			
10,500.00	10,495.95	3,341.00	3,739.01	21.01	8.32	44.05	25.53	60.00	6,760.78	6,750.62	10.15	665.797			
10,600.00	10,595.94	3,341.00	3,739.01	21.08	8.32	58.67	25.53	60.00	6,860.69	6,840.97	19.72	347.946			
10,700.00	10,695.63	3,341.00	3,739.01	21.11	8.32	7.11	25.53	60.00	6,960.20	6,936.64	23.56	295.376			
10,800.00	10,791.50	3,341.00	3,739.01	21.12	8.32	2.71	25.53	60.00	7,055.40	7,031.54	23.87	295.636			
10,900.00	10,880.02	3,341.00	3,739.01	21.16	8.32	2.03	25.53	60.00	7,143.06	7,118.92	24.14	295.920			
11,000.00	10,958.70	3,341.00	3,739.01	21.24	8.32	1.62	25.53	60.00	7,221.15	7,196.77	24.38	296.183			
11,100.00	11,026.51	3,341.00	3,739.01	21.37	8.32	1.43	25.53	60.00	7,288.96	7,264.35	24.60	296.271			
11,200.00	11,083.86	3,341.00	3,739.01	21.58	8.32	1.27	25.53	60.00	7,347.16	7,322.35	24.81	296.135			
11,300.00	11,126.68	3,341.00	3,739.01	21.87	8.32	1.17	25.53	60.00	7,391.99	7,366.99	25.00	295.694			
11,400.00	11,154.67	3,341.00	3,739.01	22.26	8.32	1.20	25.53	60.00	7,423.28	7,398.10	25.18	294.786			
11,500.00	11,166.33	3,341.00	3,739.01	22.74	8.32	1.21	25.53	60.00	7,439.57	7,414.21	25.36	293.332			
11,600.00	11,169.52	3,341.00	3,739.01	23.29	8.32	1.21	25.53	60.00	7,448.75	7,423.19	25.56	291.424			
11,700.00	11,170.81	3,341.00	3,739.01	23.93	8.32	1.10	25.53	60.00	7,457.41	7,431.63	25.79	289.215			
11,800.00	11,170.08	3,341.00	3,739.01	24.63	8.32	1.05	25.53	60.00	7,465.41	7,439.37	26.04	286.737			
11,900.00	11,168.76	3,341.00	3,739.01	25.39	8.32	0.92	25.53	60.00	7,474.19	7,447.88	26.31	284.038			
12,000.00	11,167.38	3,341.00	3,739.01	26.22	8.32	0.92	25.53	60.00	7,484.25	7,457.63	26.62	281.159			
12,100.00	11,166.10	3,341.00	3,739.01	27.09	8.32	0.97	25.53	60.00	7,495.72	7,468.77	26.95	278.135			
12,200.00	11,164.16	3,341.00	3,739.01	28.02	8.32	0.91	25.53	60.00	7,507.84	7,480.54	27.30	274.971			
12,300.00	11,163.16	3,341.00	3,739.01	28.98	8.32	0.72	25.53	60.00	7,522.24	7,494.56	27.68	271.745			
12,400.00	11,160.99	3,341.00	3,739.01	29.99	8.32	0.72	25.53	60.00	7,536.80	7,508.72	28.08	268.418			
12,500.00	11,158.27	3,341.00	3,739.01	31.03	8.32	0.72	25.53	60.00	7,552.11	7,523.61	28.49	265.039			
12,600.00	11,155.45	3,341.00	3,739.01	32.11	8.32	0.78	25.53	60.00	7,568.60	7,539.67	28.93	261.635			
12,700.00	11,152.55	3,341.00	3,739.01	33.21	8.32	0.86	25.53	60.00	7,586.29	7,556.91	29.38	258.227			
12,800.00	11,149.73	3,341.00	3,739.01	34.34	8.32	0.96	25.53	60.00	7,605.33	7,575.48	29.84	254.836			
12,900.00	11,147.73	3,341.00	3,739.01	35.49	8.32	1.04	25.53	60.00	7,626.41	7,596.08	30.32	251.495			
13,000.00	11,146.16	3,341.00	3,739.01	36.66	8.32	1.24	25.53	60.00	7,649.15	7,618.33	30.82	248.217			
13,100.00	11,143.37	3,341.00	3,739.01	37.84	8.32	1.31	25.53	60.00	7,671.91	7,640.60	31.32	244.967			
13,200.00	11,141.36	3,341.00	3,739.01	39.04	8.32	0.99	25.53	60.00	7,696.69	7,664.86	31.83	241.800			
13,300.00	11,140.35	3,341.00	3,739.01	40.27	8.32	1.00	25.53	60.00	7,723.65	7,691.30	32.35	238.734			
13,400.00	11,139.55	3,341.00	3,739.01	41.50	8.32	1.11	25.53	60.00	7,752.01	7,719.13	32.88	235.757			
13,500.00	11,139.16	3,341.00	3,739.01	42.75	8.32	1.21	25.53	60.00	7,781.93	7,748.51	33.42	232.879			
13,600.00	11,138.10	3,341.00	3,739.01	44.01	8.32	0.97	25.53	60.00	7,812.39	7,778.43	33.96	230.080			
13,700.00	11,136.36	3,341.00	3,739.01	45.28	8.32	1.13	25.53	60.00	7,843.36	7,808.86	34.50	227.359			
13,800.00	11,134.44	3,341.00	3,739.01	46.56	8.32	1.21	25.53	60.00	7,875.29	7,840.25	35.04	224.731			
13,900.00	11,131.99	3,341.00	3,739.01	47.85	8.32	0.92	25.53	60.00	7,907.89	7,872.30	35.59	222.187			
14,000.00	11,129.35	3,341.00	3,739.01	49.15	8.32	1.11	25.53	60.00	7,941.43	7,905.28	36.14	219.737			
14,100.00	11,127.30	3,341.00	3,739.01	50.46	8.32	1.01	25.53	60.00	7,976.61	7,939.91	36.69	217.400			
14,200.00	11,125.53	3,341.00	3,739.01	51.78	8.32	0.92	25.53	60.00	8,013.17	7,975.93	37.24	215.169			
14,300.00	11,123.66	3,341.00	3,739.01	53.10	8.32	1.27	25.53	60.00	8,050.70	8,012.91	37.79	213.034			
14,400.00	11,121.94	3,341.00	3,739.01	54.42	8.32	1.52	25.53	60.00	8,089.41	8,051.07	38.34	210.998			
14,500.00	11,120.47	3,341.00	3,739.01	55.75	8.32	1.35	25.53	60.00	8,129.38	8,090.50	38.88	209.063			
14,600.00	11,118.28	3,341.00	3,739.01	57.09	8.32	1.20	25.53	60.00	8,169.75	8,130.32	39.43	207.204			
14,700.00	11,115.63	3,341.00	3,739.01	58.43	8.32	1.18	25.53	60.00	8,210.72	8,170.75	39.97	205.423			
14,800.00	11,113.90	3,341.00	3,739.01	59.78	8.32	1.16	25.53	60.00	8,253.54	8,213.03	40.51	203.750			
14,900.00	11,112.44	3,341.00	3,739.01	61.13	8.32	0.56	25.53	60.00	8,297.59	8,256.55	41.04	202.171			
15,000.00	11,107.78	3,341.00	3,739.01	62.49	8.32	0.14	25.53	60.00	8,339.75	8,298.18	41.57	200.608			
15,100.00	11,100.29	3,341.00	3,739.01	63.86	8.32	0.09	25.53	60.00	8,380.33	8,338.23	42.10	199.058			
15,200.00	11,093.78	3,341.00	3,739.01	65.23	8.32	0.57	25.53	60.00	8,422.78	8,380.16	42.63	197.601			
15,300.00	11,090.64	3,341.00	3,739.01	66.60	8.32	0.82	25.53	60.00	8,469.21	8,426.06	43.15	196.295			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
API 30-025-08464 - Well #1 - OH - Assumed Surveys													Offset Well Error:	0.00 usft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation	Warning	
Depth	Depth	Depth	Depth			Tooface	+N-S	+E-W	Centres	Ellipses	Separation	Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
15,400.00	11,088.46	3,341.00	3,739.01	67.97	8.32	1.19	25.53	60.00	8,517.39	8,473.73	43.66	195.090		
15,500.00	11,085.18	3,341.00	3,739.01	69.34	8.32	1.43	25.53	60.00	8,565.47	8,521.30	44.17	193.938		
15,600.00	11,082.81	3,341.00	3,739.01	70.72	8.32	0.89	25.53	60.00	8,615.26	8,570.59	44.67	192.870		
15,700.00	11,080.37	3,341.00	3,739.01	72.10	8.32	1.04	25.53	60.00	8,665.86	8,620.70	45.17	191.869		
15,800.00	11,077.84	3,341.00	3,739.01	73.48	8.32	1.42	25.53	60.00	8,717.23	8,671.57	45.66	190.933		
15,859.00	11,076.45	3,341.00	3,739.01	74.30	8.32	1.42	25.53	60.00	8,748.01	8,702.07	45.94	190.410		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9177-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)	Offset Wellbore Centre +E/-W (usft)					
0.00	0.00	1.00	0.00	0.00	0.00	-87.22	47.62	-979.56	980.71				
100.00	100.00	101.00	100.00	0.14	0.10	87.68	47.62	-979.56	980.73	980.49	0.24	4,127.438	
200.00	200.00	201.00	200.00	0.40	0.37	78.85	47.62	-979.56	980.67	979.91	0.76	1,286.102	
300.00	300.00	301.00	300.00	0.66	0.63	86.26	47.62	-979.56	980.64	979.35	1.29	759.388	
400.00	400.00	401.00	400.00	0.91	0.90	56.76	47.62	-979.56	980.59	978.78	1.81	541.390	
500.00	500.00	501.00	500.00	1.16	1.16	67.41	47.62	-979.56	980.41	978.09	2.32	422.277	
600.00	600.00	601.00	600.00	1.42	1.43	81.78	47.62	-979.56	980.33	977.49	2.84	344.633	
700.00	700.00	701.00	700.00	1.68	1.69	77.53	47.62	-979.56	980.29	976.91	3.37	290.472	
800.00	800.00	801.00	800.00	1.95	1.96	79.49	47.62	-979.56	980.20	976.29	3.91	250.987	
900.00	900.00	901.00	900.00	2.21	2.22	65.89	47.62	-979.56	980.13	975.69	4.43	221.027	
1,000.00	1,000.00	1,001.00	1,000.00	2.47	2.49	67.89	47.62	-979.56	980.00	975.04	4.96	197.466	
1,100.00	1,100.00	1,101.00	1,100.00	2.73	2.76	45.60	47.62	-979.56	979.91	974.43	5.48	178.707	
1,200.00	1,200.00	1,201.00	1,200.00	2.98	3.02	58.68	47.62	-979.56	979.81	973.81	6.00	163.240	
1,300.00	1,299.99	1,300.99	1,299.99	3.24	3.29	57.73	47.62	-979.56	979.71	973.18	6.53	150.048	
1,400.00	1,399.99	1,400.99	1,399.99	3.50	3.55	54.78	47.62	-979.56	979.55	972.49	7.06	138.830	
1,500.00	1,499.99	1,500.99	1,499.99	3.77	3.82	55.34	47.62	-979.56	979.36	971.78	7.58	129.164	
1,600.00	1,599.99	1,600.99	1,599.99	4.02	4.08	49.90	47.62	-979.56	979.15	971.04	8.11	120.773	
1,700.00	1,699.99	1,700.99	1,699.99	4.24	4.35	5.38	47.62	-979.56	978.98	970.39	8.59	113.954	
1,754.23	1,754.22	1,755.22	1,754.22	4.28	4.49	-90.00	47.62	-979.56	978.95	970.18	8.78	111.559	
1,800.00	1,799.99	1,800.99	1,799.99	4.32	4.61	-99.90	47.62	-979.56	978.98	970.05	8.93	109.620	
1,900.00	1,899.99	1,900.99	1,899.99	4.31	4.88	-109.76	47.62	-979.56	979.13	969.94	9.19	106.543	
2,000.00	1,999.99	2,000.99	1,999.99	4.32	5.14	-108.15	47.62	-979.56	979.31	969.85	9.46	103.486	
2,100.00	2,099.99	2,100.99	2,099.99	4.34	5.41	-106.90	47.62	-979.56	979.48	969.72	9.75	100.427	
2,200.00	2,199.99	2,200.99	2,199.99	4.38	5.68	-118.56	47.62	-979.56	979.69	969.63	10.06	97.397	
2,300.00	2,299.99	2,300.99	2,299.99	4.45	5.94	-156.45	47.62	-979.56	979.94	969.55	10.39	94.277	
2,400.00	2,399.98	2,400.98	2,399.98	4.57	6.21	167.45	47.62	-979.56	980.25	969.47	10.78	90.946	
2,500.00	2,499.98	2,500.98	2,499.98	4.71	6.47	-166.65	47.62	-979.56	980.66	969.48	11.18	87.731	
2,600.00	2,599.98	2,600.98	2,599.98	4.83	6.74	-165.47	47.62	-979.56	981.23	969.67	11.57	84.816	
2,700.00	2,699.98	2,700.98	2,699.98	4.96	7.00	-158.53	47.62	-979.56	982.04	970.07	11.97	82.074	
2,800.00	2,799.97	2,800.97	2,799.97	5.11	7.27	-168.69	47.62	-979.56	983.19	970.81	12.37	79.460	
2,900.00	2,899.96	2,900.96	2,899.96	5.26	7.53	-162.01	47.62	-979.56	984.51	971.72	12.79	76.957	
3,000.00	2,999.95	3,000.95	2,999.95	5.43	7.80	-173.03	47.62	-979.56	986.15	972.92	13.23	74.567	
3,100.00	3,099.94	3,100.94	3,099.94	5.62	8.06	127.10	47.62	-979.56	987.25	973.57	13.69	72.135	
3,200.00	3,199.94	3,200.94	3,199.94	5.80	8.33	-10.58	47.62	-979.56	987.03	972.90	14.13	69.869	
3,300.00	3,299.94	3,300.94	3,299.94	5.92	8.59	-68.02	47.62	-979.56	986.56	972.04	14.52	67.951	
3,400.00	3,399.93	3,400.93	3,399.93	6.04	8.86	-88.18	47.62	-979.56	986.44	971.54	14.90	66.202	
3,432.61	3,432.54	3,433.54	3,432.54	6.08	8.95	-90.00	47.62	-979.56	986.44	971.41	15.03	65.639	
3,500.00	3,499.93	3,500.93	3,499.93	6.17	9.13	-94.10	47.62	-979.56	986.45	971.15	15.29	64.507	
3,600.00	3,599.93	3,600.93	3,599.93	6.30	9.39	-84.54	47.62	-979.56	986.46	970.77	15.69	62.855	
3,700.00	3,699.93	3,700.93	3,699.93	6.45	9.66	-14.94	47.62	-979.56	985.96	969.85	16.11	61.201	
3,800.00	3,799.92	3,800.92	3,799.92	6.62	9.92	-1.01	47.62	-979.56	985.31	968.77	16.54	59.569	
3,900.00	3,899.92	3,900.92	3,899.92	6.79	10.19	5.73	47.62	-979.56	984.43	967.45	16.98	57.970	
4,000.00	3,999.92	4,000.92	3,999.92	6.97	10.45	-10.34	47.62	-979.56	983.46	966.04	17.43	56.435	
4,100.00	4,099.91	4,100.91	4,099.91	7.15	10.72	-14.24	47.62	-979.56	982.52	964.65	17.87	54.978	
4,200.00	4,199.90	4,200.90	4,199.90	7.34	10.98	-4.88	47.62	-979.56	981.39	963.07	18.32	53.562	
4,282.62	4,282.52	4,283.52	4,282.52	7.49	11.20	96.50	47.62	-979.56	980.92	962.23	18.70	52.462	
4,300.00	4,299.90	4,300.90	4,299.90	7.53	11.25	110.14	47.62	-979.56	980.86	962.08	18.78	52.238	
4,400.00	4,399.90	4,400.90	4,399.90	7.71	11.51	-23.30	47.62	-979.56	980.62	961.39	19.23	51.003	
4,500.00	4,499.89	4,500.89	4,499.89	7.89	11.78	-31.66	47.62	-979.56	979.62	959.95	19.67	49.791	
4,600.00	4,599.89	4,600.89	4,599.89	8.08	12.05	-28.02	47.62	-979.56	978.74	958.62	20.13	48.630	
4,700.00	4,699.88	4,700.88	4,699.88	8.27	12.31	-36.04	47.62	-979.56	977.89	957.32	20.58	47.521	
4,800.00	4,799.88	4,800.88	4,799.88	8.45	12.58	69.07	47.62	-979.56	977.57	956.54	21.03	46.482	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9177-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)	Offset Wellbore Centre +E/-W (usft)						
4,900.00	4,899.87	4,900.87	4,899.87	8.65	12.84	-32.60	47.62	-979.56	976.89	955.40	21.49	45.462		
5,000.00	4,999.87	5,000.87	4,999.87	8.84	13.11	-36.03	47.62	-979.56	976.01	954.06	21.95	44.473		
5,100.00	5,099.86	5,100.86	5,099.86	9.03	13.37	-36.37	47.62	-979.56	975.23	952.82	22.41	43.522		
5,200.00	5,199.86	5,200.86	5,199.86	9.23	13.64	-49.79	47.62	-979.56	974.42	951.56	22.87	42.611		
5,300.00	5,299.85	5,300.85	5,299.85	9.42	13.90	-41.86	47.62	-979.56	973.76	950.43	23.33	41.741		
5,400.00	5,399.85	5,400.85	5,399.85	9.63	14.17	-21.54	47.62	-979.56	972.89	949.09	23.80	40.876		
5,500.00	5,499.85	5,500.85	5,499.85	9.85	14.43	5.04	47.62	-979.56	972.45	948.16	24.28	40.048		
5,554.39	5,554.23	5,555.23	5,554.23	9.95	14.58	90.00	47.62	-979.56	972.36	947.84	24.53	39.645		
5,600.00	5,599.85	5,600.85	5,599.85	10.03	14.70	143.71	47.62	-979.56	972.38	947.64	24.73	39.316		
5,700.00	5,699.84	5,700.84	5,699.84	10.19	14.97	89.82	47.62	-979.56	972.62	947.46	25.16	38.661		
5,800.00	5,799.84	5,800.84	5,799.84	10.37	15.23	78.27	47.62	-979.56	972.53	946.92	25.60	37.983		
5,900.00	5,899.84	5,900.84	5,899.84	10.56	15.50	79.82	47.62	-979.56	972.44	946.38	26.06	37.316		
6,000.00	5,999.83	6,000.83	5,999.83	10.76	15.76	74.73	47.62	-979.56	972.03	945.51	26.52	36.654		
6,100.00	6,099.75	6,100.75	6,099.75	10.96	16.03	73.19	47.62	-979.56	970.96	943.98	26.98	35.983		
6,200.00	6,199.65	6,200.65	6,199.65	11.16	16.29	70.64	47.62	-979.56	969.55	942.10	27.45	35.316		
6,300.00	6,299.55	6,300.55	6,299.55	11.37	16.56	71.79	47.62	-979.56	968.13	940.20	27.93	34.668		
6,400.00	6,399.46	6,400.46	6,399.46	11.58	16.82	70.80	47.62	-979.56	966.72	938.32	28.40	34.038		
6,500.00	6,499.38	6,500.38	6,499.38	11.79	17.09	71.91	47.62	-979.56	965.47	936.59	28.88	33.432		
6,600.00	6,599.32	6,600.32	6,599.32	12.01	17.35	73.88	47.62	-979.56	964.40	935.05	29.36	32.850		
6,700.00	6,699.26	6,700.26	6,699.26	12.22	17.62	76.25	47.62	-979.56	963.60	933.77	29.84	32.295		
6,800.00	6,799.17	6,800.17	6,799.17	12.44	17.88	72.10	47.62	-979.56	962.46	932.14	30.32	31.744		
6,900.00	6,899.07	6,900.07	6,899.07	12.66	18.15	71.73	47.62	-979.56	960.98	930.18	30.81	31.195		
7,000.00	6,998.97	6,999.97	6,998.97	12.88	18.41	70.01	47.62	-979.56	959.59	928.30	31.29	30.664		
7,100.00	7,098.86	7,099.86	7,098.86	13.11	18.68	65.97	47.62	-979.56	957.86	926.07	31.79	30.135		
7,200.00	7,198.77	7,199.77	7,198.77	13.34	18.94	69.17	47.62	-979.56	956.14	923.86	32.28	29.621		
7,300.00	7,298.67	7,299.67	7,298.67	13.56	19.21	81.71	47.62	-979.56	955.00	922.23	32.77	29.143		
7,400.00	7,398.55	7,399.55	7,398.55	13.78	19.47	82.34	47.62	-979.56	954.42	921.16	33.26	28.697		
7,500.00	7,498.44	7,499.44	7,498.44	14.01	19.74	69.31	47.62	-979.56	953.29	919.54	33.75	28.245		
7,600.00	7,598.30	7,599.30	7,598.30	14.25	20.00	71.32	47.62	-979.56	951.43	917.18	34.25	27.779		
7,700.00	7,698.13	7,699.13	7,698.13	14.48	20.27	68.12	47.62	-979.56	949.42	914.67	34.75	27.322		
7,800.00	7,797.98	7,798.98	7,797.98	14.72	20.53	68.92	47.62	-979.56	947.40	912.15	35.25	26.875		
7,900.00	7,897.86	7,898.86	7,897.86	14.96	20.80	70.59	47.62	-979.56	945.68	909.93	35.75	26.450		
8,000.00	7,997.77	7,998.77	7,997.77	15.19	21.07	72.35	47.62	-979.56	944.43	908.17	36.26	26.048		
8,100.00	8,097.70	8,098.70	8,097.70	15.43	21.33	70.14	47.62	-979.56	943.19	906.43	36.76	25.658		
8,200.00	8,197.64	8,198.64	8,197.64	15.67	21.60	74.01	47.62	-979.56	942.03	904.77	37.26	25.279		
8,300.00	8,297.56	8,298.56	8,297.56	15.91	21.86	81.60	47.62	-979.56	941.23	903.47	37.77	24.922		
8,400.00	8,397.45	8,398.45	8,397.45	16.15	22.13	84.70	47.62	-979.56	940.73	902.46	38.27	24.582		
8,500.00	8,497.32	8,498.32	8,497.32	16.38	22.39	86.31	47.62	-979.56	940.29	901.52	38.77	24.253		
8,600.00	8,597.19	8,598.19	8,597.19	16.62	22.66	88.36	47.62	-979.56	940.07	900.80	39.27	23.939		
8,670.48	8,667.58	8,668.58	8,667.58	16.78	22.84	90.43	47.62	-979.56	940.04	900.41	39.62	23.725		
8,700.00	8,697.07	8,698.07	8,697.07	16.85	22.92	91.33	47.62	-979.56	940.03	900.26	39.77	23.636		
8,800.00	8,796.96	8,797.96	8,796.96	17.09	23.19	89.42	47.62	-979.56	940.14	899.87	40.27	23.345		
8,900.00	8,896.87	8,897.87	8,896.87	17.33	23.45	76.50	47.62	-979.56	939.74	898.96	40.78	23.046		
9,000.00	8,996.80	8,997.80	8,996.80	17.57	23.72	81.47	47.62	-979.56	938.91	897.62	41.29	22.742		
9,100.00	9,096.75	9,097.75	9,096.75	17.82	23.98	62.93	47.62	-979.56	938.04	896.24	41.80	22.443		
9,200.00	9,196.70	9,197.70	9,196.70	18.06	24.21	33.73	47.71	-979.60	936.14	893.88	42.26	22.152		
9,226.74	9,223.42	9,200.00	9,198.99	18.12	24.22	36.39	48.13	-979.78	935.96	893.63	42.33	22.110 CC, ES		
9,300.00	9,296.64	9,233.70	9,232.57	18.30	24.23	42.42	50.69	-980.93	937.44	895.00	42.44	22.090		
9,400.00	9,396.58	9,275.00	9,273.31	18.54	24.23	61.77	56.77	-983.66	944.99	902.53	42.46	22.254		
9,500.00	9,496.53	9,325.00	9,321.64	18.79	24.24	68.03	68.38	-988.87	959.08	916.66	42.42	22.611		
9,600.00	9,596.47	9,364.30	9,358.53	19.03	24.25	93.34	80.72	-994.40	980.17	937.99	42.18	23.235		
9,700.00	9,696.39	9,400.00	9,390.98	19.27	24.26	94.35	94.28	-1,000.48	1,007.63	965.83	41.80	24.107		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 102 H - OH - Plan 1 08-29-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9177-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)	Offset Wellbore Centre +E/-W (usft)							
9,800.00	9,796.32	9,437.33	9,423.62	19.51	24.27	94.77	110.79	-1,007.88	1,040.93	999.59	41.34	25.183			
9,900.00	9,896.23	9,475.00	9,455.03	19.75	24.29	93.88	129.76	-1,016.39	1,079.85	1,039.05	40.81	26.462			
10,000.00	9,996.15	9,500.00	9,474.92	20.00	24.30	91.75	143.57	-1,022.58	1,123.98	1,083.91	40.07	28.053			
10,100.00	10,096.08	9,525.00	9,494.00	20.25	24.31	78.68	158.31	-1,029.19	1,172.84	1,133.55	39.29	29.852			
10,200.00	10,196.03	9,552.00	9,513.62	20.49	24.34	51.04	175.23	-1,036.77	1,225.46	1,186.95	38.52	31.815			
10,300.00	10,296.00	9,581.98	9,534.24	20.71	24.37	14.55	195.28	-1,045.22	1,281.49	1,243.71	37.77	33.925			
10,400.00	10,395.97	9,612.98	9,554.28	20.89	24.42	-17.23	217.44	-1,053.46	1,340.83	1,303.80	37.03	36.212			
10,500.00	10,495.95	9,640.33	9,570.82	21.01	24.46	-38.91	238.12	-1,060.29	1,403.84	1,367.60	36.23	38.744			
10,600.00	10,595.94	9,664.32	9,584.39	21.08	24.50	-22.89	257.08	-1,065.91	1,470.18	1,431.73	38.46	38.230			
10,700.00	10,695.63	9,686.91	9,596.36	21.11	24.55	-53.64	275.59	-1,070.88	1,537.50	1,497.78	39.71	38.717			
10,800.00	10,791.50	9,712.91	9,609.09	21.12	24.61	-52.54	297.61	-1,076.20	1,599.75	1,560.30	39.45	40.552			
10,900.00	10,880.02	9,741.01	9,621.58	21.16	24.67	-45.21	322.23	-1,081.45	1,656.02	1,616.76	39.25	42.188			
11,000.00	10,958.70	9,775.00	9,634.85	21.24	24.76	-40.43	353.00	-1,087.08	1,702.55	1,663.42	39.13	43.515			
11,100.00	11,026.51	9,800.00	9,643.30	21.37	24.83	-38.40	376.25	-1,090.69	1,741.34	1,702.31	39.03	44.621			
11,200.00	11,083.86	9,825.00	9,650.60	21.58	24.91	-36.32	399.95	-1,093.86	1,773.50	1,734.49	39.01	45.462			
11,300.00	11,126.68	9,863.48	9,659.56	21.87	25.04	-34.93	437.14	-1,097.83	1,795.75	1,756.60	39.15	45.869			
11,400.00	11,154.67	9,900.00	9,665.46	22.26	25.17	-34.60	473.07	-1,100.57	1,809.86	1,770.46	39.39	45.944			
11,500.00	11,166.33	9,925.00	9,668.02	22.74	25.26	-34.40	497.91	-1,101.85	1,815.93	1,776.19	39.74	45.693			
11,600.00	11,169.52	9,958.91	9,669.55	23.29	25.40	-34.47	531.76	-1,102.82	1,819.13	1,778.92	40.22	45.235			
11,700.00	11,170.81	10,035.89	9,669.00	23.93	25.73	-34.51	608.74	-1,103.41	1,822.94	1,782.10	40.84	44.639			
11,800.00	11,170.08	10,135.87	9,668.13	24.63	26.23	-34.57	708.71	-1,104.11	1,824.37	1,782.78	41.58	43.871			
11,900.00	11,168.76	10,235.86	9,667.27	25.39	26.79	-34.61	808.70	-1,104.81	1,824.26	1,781.85	42.41	43.011			
12,000.00	11,167.38	10,335.86	9,666.40	26.22	27.42	-34.60	908.69	-1,105.51	1,823.57	1,780.25	43.32	42.092			
12,100.00	11,166.10	10,435.86	9,665.53	27.09	28.11	-34.60	1,008.68	-1,106.22	1,823.13	1,778.82	44.31	41.143			
12,200.00	11,164.16	10,535.85	9,664.67	28.02	28.86	-34.63	1,108.67	-1,106.92	1,822.42	1,777.04	45.39	40.154			
12,300.00	11,163.16	10,635.83	9,663.80	28.98	29.66	-34.59	1,208.64	-1,107.62	1,821.15	1,774.65	46.50	39.161			
12,400.00	11,160.99	10,735.78	9,662.93	29.99	30.50	-34.55	1,308.59	-1,108.33	1,818.58	1,770.90	47.69	38.137			
12,500.00	11,158.27	10,835.73	9,662.07	31.03	31.39	-34.52	1,408.53	-1,109.03	1,815.54	1,766.61	48.93	37.106			
12,600.00	11,155.45	10,935.68	9,661.20	32.11	32.32	-34.49	1,508.47	-1,109.73	1,812.51	1,762.29	50.23	36.085			
12,700.00	11,152.55	11,035.64	9,660.33	33.21	33.28	-34.48	1,608.43	-1,110.43	1,809.86	1,758.27	51.59	35.084			
12,800.00	11,149.73	11,135.62	9,659.47	34.34	34.28	-34.47	1,708.40	-1,111.14	1,807.62	1,754.62	53.00	34.107			
12,900.00	11,147.73	11,235.61	9,658.60	35.49	35.31	-34.48	1,808.38	-1,111.84	1,806.50	1,752.04	54.46	33.172			
13,000.00	11,146.16	11,335.60	9,657.73	36.66	36.37	-34.49	1,908.37	-1,112.54	1,806.21	1,750.24	55.96	32.274			
13,100.00	11,143.37	11,435.57	9,656.87	37.84	37.46	-34.57	2,008.33	-1,113.24	1,805.58	1,748.05	57.53	31.383			
13,200.00	11,141.36	11,535.56	9,656.00	39.04	38.56	-34.63	2,108.31	-1,113.95	1,805.15	1,746.03	59.12	30.532			
13,300.00	11,140.35	11,635.56	9,655.13	40.27	39.69	-34.62	2,208.30	-1,114.65	1,804.87	1,744.15	60.72	29.725			
13,328.85	11,140.08	11,664.41	9,654.88	40.62	40.02	-34.62	2,237.16	-1,114.85	1,804.84	1,743.66	61.19	29.497			
13,400.00	11,139.55	11,735.56	9,654.27	41.50	40.84	-34.62	2,308.30	-1,115.35	1,805.00	1,742.65	62.35	28.950			
13,500.00	11,139.16	11,835.55	9,653.40	42.75	42.01	-34.63	2,408.29	-1,116.06	1,805.87	1,741.86	64.01	28.212			
13,600.00	11,138.10	11,935.55	9,652.53	44.01	43.20	-34.65	2,508.28	-1,116.76	1,805.81	1,740.11	65.70	27.487			
13,700.00	11,136.36	12,035.55	9,651.67	45.28	44.40	-34.66	2,608.27	-1,117.46	1,805.11	1,737.70	67.41	26.779			
13,800.00	11,134.44	12,135.53	9,650.80	46.56	45.61	-34.70	2,708.25	-1,118.17	1,804.90	1,735.73	69.16	26.096			
13,900.00	11,131.99	12,235.52	9,649.93	47.85	46.84	-34.74	2,808.23	-1,118.87	1,803.55	1,732.63	70.92	25.429			
14,000.00	11,129.35	12,335.50	9,649.07	49.15	48.08	-34.77	2,908.21	-1,119.57	1,802.07	1,729.36	72.71	24.785			
14,100.00	11,127.30	12,435.49	9,648.20	50.46	49.33	-34.81	3,008.19	-1,120.27	1,801.48	1,726.97	74.52	24.176			
14,200.00	11,125.53	12,535.49	9,647.33	51.78	50.59	-34.81	3,108.18	-1,120.98	1,800.34	1,724.03	76.31	23.592			
14,300.00	11,123.66	12,635.48	9,646.46	53.10	51.86	-34.83	3,208.16	-1,121.68	1,799.75	1,721.60	78.14	23.032			
14,323.20	11,123.24	12,658.68	9,646.26	53.40	52.16	-34.84	3,231.36	-1,121.84	1,799.72	1,721.15	78.57	22.905			
14,400.00	11,121.94	12,735.46	9,645.60	54.42	53.14	-34.87	3,308.14	-1,122.38	1,799.96	1,719.95	80.01	22.496			
14,500.00	11,120.47	12,835.44	9,644.73	55.75	54.43	-34.94	3,408.11	-1,123.09	1,800.59	1,718.69	81.90	21.985			
14,600.00	11,118.28	12,935.43	9,643.86	57.09	55.73	-35.00	3,508.09	-1,123.79	1,800.07	1,716.28	83.79	21.482			
14,700.00	11,115.63	13,035.41	9,643.00	58.43	57.03	-35.05	3,608.07	-1,124.49	1,799.07	1,713.36	85.70	20.992			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Black & Tan 27 Federal Com - 102 H - OH - Plan 1 08-29-17		Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 9177-MWD+HDGM													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)								
14,772.11	11,114.30	13,107.51	9,642.37	59.40	57.97	-35.08	3,680.17	-1,125.00	1,798.80	1,711.72	87.08	20.657				
14,800.00	11,113.90	13,135.40	9,642.13	59.78	58.34	-35.09	3,708.05	-1,125.19	1,798.79	1,711.18	87.61	20.532				
14,900.00	11,112.44	13,235.39	9,641.26	61.13	59.65	-35.11	3,808.04	-1,125.90	1,798.18	1,708.68	89.50	20.091				
15,000.00	11,107.78	13,335.29	9,640.40	62.49	60.97	-35.19	3,907.93	-1,126.60	1,793.86	1,702.45	91.41	19.625				
15,100.00	11,100.29	13,435.03	9,639.53	63.86	62.30	-35.27	4,007.66	-1,127.30	1,786.77	1,693.42	93.35	19.140				
15,200.00	11,093.78	13,534.84	9,638.67	65.23	63.63	-35.24	4,107.47	-1,128.00	1,780.92	1,685.61	95.31	18.686				
15,300.00	11,090.64	13,634.80	9,637.80	66.60	64.97	-35.23	4,207.43	-1,128.71	1,778.47	1,681.23	97.25	18.288				
15,400.00	11,088.46	13,734.79	9,636.93	67.97	66.31	-35.24	4,307.41	-1,129.41	1,777.33	1,678.13	99.20	17.917				
15,500.00	11,085.18	13,834.76	9,636.07	69.34	67.65	-35.31	4,407.37	-1,130.11	1,776.08	1,674.86	101.22	17.547				
15,600.00	11,082.81	13,934.74	9,635.20	70.72	69.00	-35.36	4,507.35	-1,130.81	1,774.97	1,671.77	103.20	17.200				
15,700.00	11,080.37	14,034.73	9,634.33	72.10	70.36	-35.38	4,607.33	-1,131.52	1,773.50	1,668.33	105.17	16.863				
15,800.00	11,077.84	14,134.71	9,633.47	73.48	71.71	-35.42	4,707.30	-1,132.22	1,772.53	1,665.35	107.18	16.537				
15,859.00	11,076.45	14,193.70	9,632.96	74.30	72.52	-35.45	4,766.29	-1,132.63	1,772.20	1,663.82	108.38	16.352 SF				

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design												Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 103H - OH - Plan 1 09-05-17												Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9202-MWD+HDGM													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	35.33	55.34	39.23	67.83				
100.00	100.00	100.00	100.00	0.14	0.10	-149.84	55.34	39.23	67.91	67.68	0.23	289.019	
200.00	200.00	200.00	200.00	0.40	0.36	-158.74	55.34	39.23	68.13	67.37	0.76	89.666	
300.00	300.00	300.00	300.00	0.66	0.63	-151.50	55.34	39.23	68.47	67.18	1.29	53.133	
400.00	400.00	400.00	400.00	0.91	0.89	-178.90	55.34	39.23	68.72	66.91	1.81	37.997	
500.00	500.00	500.00	500.00	1.16	1.16	-170.43	55.34	39.23	69.00	66.68	2.32	29.753	
600.00	600.00	600.00	600.00	1.42	1.43	-156.19	55.34	39.23	69.36	66.51	2.84	24.405	
700.00	700.00	700.00	700.00	1.68	1.69	-160.54	55.34	39.23	69.61	66.24	3.37	20.642	
800.00	800.00	800.00	800.00	1.95	1.96	-158.72	55.34	39.23	69.99	66.08	3.90	17.933	
900.00	900.00	900.00	900.00	2.21	2.22	-172.39	55.34	39.23	70.26	65.83	4.43	15.853	
1,000.00	1,000.00	1,000.00	1,000.00	2.47	2.49	-170.43	55.34	39.23	70.55	65.59	4.96	14.223	
1,100.00	1,100.00	1,100.00	1,100.00	2.73	2.75	167.25	55.34	39.23	70.75	65.27	5.48	12.909	
1,200.00	1,200.00	1,200.00	1,200.00	2.98	3.02	-179.66	55.34	39.23	70.90	64.90	6.00	11.818	
1,300.00	1,299.99	1,299.99	1,299.99	3.24	3.28	179.38	55.34	39.23	71.10	64.58	6.53	10.894	
1,400.00	1,399.99	1,399.99	1,399.99	3.50	3.55	176.42	55.34	39.23	71.38	64.33	7.05	10.121	
1,500.00	1,499.99	1,499.99	1,499.99	3.77	3.81	176.99	55.34	39.23	71.73	64.15	7.58	9.463	
1,600.00	1,599.99	1,599.99	1,599.99	4.02	4.08	171.56	55.34	39.23	72.06	63.95	8.10	8.891	
1,700.00	1,699.99	1,699.99	1,699.99	4.24	4.35	127.05	55.34	39.23	72.32	63.73	8.59	8.421	
1,800.00	1,799.99	1,799.99	1,799.99	4.32	4.61	21.93	55.34	39.23	72.05	63.13	8.93	8.071	
1,900.00	1,899.99	1,899.99	1,899.99	4.31	4.88	12.22	55.34	39.23	71.53	62.35	9.19	7.786	
2,000.00	1,999.99	1,999.99	1,999.99	4.32	5.14	13.93	55.34	39.23	71.04	61.58	9.46	7.509	
2,100.00	2,099.99	2,099.99	2,099.99	4.34	5.41	15.36	55.34	39.23	70.45	60.70	9.75	7.225	
2,200.00	2,199.99	2,199.99	2,199.99	4.38	5.67	3.82	55.34	39.23	69.86	59.81	10.06	6.947	
2,300.00	2,299.99	2,299.99	2,299.99	4.45	5.94	-34.10	55.34	39.23	69.49	59.10	10.39	6.687	
2,400.00	2,399.98	2,399.98	2,399.98	4.57	6.20	-70.41	55.34	39.23	69.33	58.55	10.78	6.434	
2,500.00	2,499.98	2,499.98	2,499.98	4.71	6.47	-44.81	55.34	39.23	69.13	57.95	11.18	6.186	
2,600.00	2,599.98	2,599.98	2,599.98	4.83	6.73	-43.96	55.34	39.23	68.68	57.12	11.57	5.938	
2,700.00	2,699.98	2,699.98	2,699.98	4.96	7.00	-37.47	55.34	39.23	68.04	56.08	11.96	5.688	
2,800.00	2,799.97	2,799.97	2,799.97	5.11	7.27	-48.31	55.34	39.23	67.17	54.80	12.37	5.430	
2,900.00	2,899.96	2,899.96	2,899.96	5.26	7.53	-42.44	55.34	39.23	66.20	53.40	12.79	5.175	
3,000.00	2,999.95	2,999.95	2,999.95	5.43	7.80	-54.52	55.34	39.23	65.07	51.85	13.22	4.922	
3,075.99	3,075.93	3,075.93	3,075.93	5.58	8.00	-90.00	55.34	39.23	64.69	51.12	13.57	4.766	
3,100.00	3,099.94	3,099.94	3,099.94	5.62	8.06	-115.40	55.34	39.23	64.84	51.15	13.68	4.738	
3,200.00	3,199.94	3,199.94	3,199.94	5.80	8.33	106.97	55.34	39.23	65.17	51.05	14.12	4.614	
3,300.00	3,299.94	3,299.94	3,299.94	5.92	8.59	50.14	55.34	39.23	64.93	50.41	14.52	4.473	
3,400.00	3,399.93	3,399.93	3,399.93	6.04	8.86	30.43	55.34	39.23	64.34	49.45	14.90	4.319	
3,500.00	3,499.93	3,499.93	3,499.93	6.17	9.12	24.83	55.34	39.23	63.76	48.47	15.29	4.170	
3,600.00	3,599.93	3,599.93	3,599.93	6.30	9.39	54.67	55.34	39.23	63.23	47.54	15.69	4.030	
3,666.71	3,666.64	3,666.64	3,666.64	6.40	9.57	90.12	55.34	39.23	63.13	47.16	15.97	3.953 CC	
3,700.00	3,699.93	3,699.93	3,699.93	6.45	9.65	104.83	55.34	39.23	63.20	47.09	16.11	3.923	
3,800.00	3,799.92	3,799.92	3,799.92	6.62	9.92	119.30	55.34	39.23	63.48	46.94	16.54	3.838	
3,900.00	3,899.92	3,899.92	3,899.92	6.79	10.18	126.69	55.34	39.23	63.95	46.97	16.98	3.766	
4,000.00	3,999.92	3,999.92	3,999.92	6.97	10.45	111.35	55.34	39.23	64.48	47.05	17.42	3.701	
4,100.00	4,099.91	4,099.91	4,099.91	7.15	10.72	108.29	55.34	39.23	64.76	46.89	17.87	3.624	
4,200.00	4,199.90	4,199.90	4,199.90	7.34	10.98	118.59	55.34	39.23	65.21	46.89	18.32	3.560	
4,300.00	4,299.90	4,299.90	4,299.90	7.53	11.25	-126.21	55.34	39.23	65.84	47.06	18.77	3.507	
4,400.00	4,399.90	4,399.90	4,399.90	7.71	11.51	100.34	55.34	39.23	66.27	47.04	19.22	3.447	
4,500.00	4,499.89	4,499.89	4,499.89	7.89	11.78	92.97	55.34	39.23	66.39	46.72	19.67	3.375	
4,600.00	4,599.89	4,599.89	4,599.89	8.08	12.04	97.50	55.34	39.23	66.51	46.38	20.12	3.305	
4,698.63	4,698.52	4,698.52	4,698.52	8.26	12.30	90.41	55.34	39.23	66.57	46.00	20.57	3.237	
4,700.00	4,699.88	4,699.88	4,699.88	8.27	12.31	90.44	55.34	39.23	66.47	45.90	20.58	3.231	
4,800.00	4,799.88	4,799.88	4,799.88	8.45	12.57	-164.45	55.34	39.23	66.97	45.94	21.03	3.185	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 103H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 9202-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance						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)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,899.87	4,899.87	4,899.87	8.65	12.84	94.43	55.34	39.23	67.28	45.79	21.49	3.131		
5,000.00	4,999.87	4,999.87	4,999.87	8.84	13.10	91.95	55.34	39.23	67.32	45.38	21.94	3.068		
5,100.00	5,099.86	5,099.86	5,099.86	9.03	13.37	92.45	55.34	39.23	67.37	44.97	22.40	3.007		
5,200.00	5,199.86	5,199.86	5,199.86	9.23	13.64	79.97	55.34	39.23	67.35	44.48	22.87	2.945		
5,300.00	5,299.85	5,299.85	5,299.85	9.42	13.90	88.89	55.34	39.23	67.09	43.76	23.33	2.876		
5,307.70	5,307.55	5,307.55	5,307.55	9.44	13.92	90.00	55.34	39.23	67.09	43.73	23.36	2.872		
5,400.00	5,399.85	5,399.85	5,399.85	9.63	14.17	110.06	55.34	39.23	67.30	43.50	23.80	2.828		
5,500.00	5,499.85	5,499.85	5,499.85	9.85	14.43	136.98	55.34	39.23	67.52	43.24	24.28	2.781		
5,600.00	5,599.85	5,599.85	5,599.85	10.03	14.70	-84.38	55.34	39.23	67.66	42.93	24.73	2.736		
5,609.01	5,608.86	5,608.86	5,608.86	10.05	14.72	-90.00	55.34	39.23	67.66	42.89	24.77	2.732		
5,700.00	5,699.84	5,699.84	5,699.84	10.19	14.96	-138.59	55.34	39.23	67.71	42.56	25.15	2.692		
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	-150.36	55.34	39.23	68.10	42.49	25.60	2.660		
5,900.00	5,899.84	5,899.84	5,899.84	10.56	15.49	-149.03	55.34	39.23	68.48	42.43	26.06	2.628	ES, SF	
6,000.00	5,999.83	5,999.83	5,999.83	10.76	15.76	-154.81	55.34	39.23	69.96	43.45	26.52	2.639		
6,100.00	6,099.75	6,099.75	6,099.75	10.96	16.02	-157.79	55.34	39.23	73.48	46.50	26.98	2.723		
6,200.00	6,199.65	6,199.65	6,199.65	11.16	16.29	-161.77	55.34	39.23	77.70	50.25	27.45	2.831		
6,300.00	6,299.55	6,299.55	6,299.55	11.37	16.55	-161.88	55.34	39.23	81.95	54.02	27.92	2.935		
6,400.00	6,399.46	6,399.46	6,399.46	11.58	16.82	-163.97	55.34	39.23	86.08	57.68	28.40	3.031		
6,500.00	6,499.38	6,499.38	6,499.38	11.79	17.09	-163.79	55.34	39.23	89.86	60.99	28.87	3.112		
6,600.00	6,599.32	6,598.40	6,598.40	12.01	17.27	-162.18	55.30	40.07	93.68	64.41	29.27	3.201		
6,700.00	6,699.26	6,697.33	6,697.29	12.22	17.38	-159.47	55.17	42.62	98.37	68.78	29.59	3.324		
6,800.00	6,799.17	6,796.07	6,795.93	12.44	17.49	-162.69	54.95	46.87	104.88	74.97	29.91	3.506		
6,900.00	6,899.07	6,894.98	6,894.67	12.66	17.61	-161.55	54.65	52.71	112.80	82.56	30.24	3.731		
7,000.00	6,998.97	6,994.58	6,994.08	12.88	17.73	-161.88	54.34	58.94	121.00	90.42	30.58	3.957		
7,100.00	7,098.86	7,094.16	7,093.47	13.11	17.85	-164.61	54.02	65.18	129.49	98.56	30.92	4.187		
7,200.00	7,198.77	7,193.76	7,192.86	13.34	17.98	-160.19	53.71	71.41	137.85	106.57	31.28	4.407		
7,300.00	7,298.67	7,293.38	7,292.29	13.56	18.11	-146.81	53.39	77.65	146.14	114.51	31.63	4.621		
7,400.00	7,398.55	7,393.01	7,391.73	13.78	18.24	-145.84	53.07	83.88	154.54	122.56	31.98	4.832		
7,500.00	7,498.44	7,492.62	7,491.14	14.01	18.38	-158.38	52.76	90.12	163.10	130.75	32.34	5.043		
7,600.00	7,598.30	7,592.14	7,590.46	14.25	18.51	-155.88	52.44	96.35	172.58	139.87	32.71	5.276		
7,700.00	7,698.13	7,691.63	7,689.76	14.48	18.66	-158.75	52.12	102.58	182.46	149.38	33.08	5.515		
7,800.00	7,797.98	7,791.13	7,789.06	14.72	18.80	-157.58	51.81	108.80	192.19	158.73	33.46	5.744		
7,900.00	7,897.86	7,890.68	7,888.42	14.96	18.95	-155.54	51.49	115.04	201.37	167.53	33.84	5.950		
8,000.00	7,997.77	7,990.31	7,987.85	15.19	19.10	-153.36	51.18	121.27	209.71	175.48	34.23	6.127		
8,100.00	8,097.70	8,089.95	8,087.29	15.43	19.25	-155.13	50.86	127.51	217.83	183.22	34.61	6.293		
8,200.00	8,197.64	8,189.59	8,186.74	15.67	19.40	-150.83	50.54	133.75	225.89	190.89	35.00	6.453		
8,300.00	8,297.56	8,289.25	8,286.20	15.91	19.56	-142.97	50.23	139.98	233.93	198.53	35.40	6.609		
8,400.00	8,397.45	8,388.88	8,385.63	16.15	19.72	-139.92	49.91	146.22	242.52	206.73	35.79	6.776		
8,500.00	8,497.32	8,488.49	8,485.05	16.38	19.88	-138.46	49.59	152.46	251.25	215.07	36.18	6.944		
8,600.00	8,597.19	8,588.12	8,584.48	16.62	20.04	-136.61	49.28	158.69	259.90	223.32	36.58	7.105		
8,700.00	8,697.07	8,687.76	8,683.93	16.85	20.21	-133.85	48.96	164.93	268.33	231.35	36.98	7.256		
8,800.00	8,796.96	8,787.43	8,783.40	17.09	20.38	-135.95	48.65	171.17	276.47	239.09	37.38	7.396		
8,900.00	8,896.87	8,887.08	8,882.86	17.33	20.55	-148.91	48.33	177.40	284.62	246.83	37.79	7.532		
9,000.00	8,996.80	8,986.75	8,982.33	17.57	20.72	-143.75	48.01	183.64	292.58	254.38	38.20	7.659		
9,100.00	9,096.75	9,086.42	9,081.80	17.82	20.90	-162.09	47.70	189.88	300.40	261.78	38.62	7.779		
9,200.00	9,196.70	9,186.03	9,181.22	18.06	21.08	169.18	47.38	196.12	308.46	269.43	39.03	7.902		
9,300.00	9,296.64	9,263.06	9,257.94	18.30	21.13	177.67	51.08	200.90	319.85	280.74	39.10	8.179		
9,400.00	9,396.58	9,332.84	9,326.16	18.54	21.14	-164.88	64.83	205.09	339.74	300.88	38.86	8.743		
9,500.00	9,496.53	9,400.00	9,389.27	18.79	21.16	-162.06	87.34	208.90	367.82	329.44	38.38	9.584		
9,600.00	9,596.47	9,450.00	9,433.87	19.03	21.18	-139.52	109.73	211.56	405.22	367.95	37.27	10.872		
9,700.00	9,696.39	9,500.00	9,475.89	19.27	21.20	-142.42	136.67	214.02	451.67	415.59	36.09	12.516		
9,800.00	9,796.32	9,550.00	9,514.87	19.51	21.23	-145.81	167.87	216.26	506.61	471.63	34.98	14.482		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 103H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 9202-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		
9,900.00	9,896.23	9,582.08	9,538.08	19.75	21.25	-149.68	189.96	217.57	569.09	535.62	33.47	17.005		
10,000.00	9,996.15	9,613.21	9,559.14	20.00	21.26	-154.68	212.86	218.75	637.58	605.44	32.14	19.836		
10,100.00	10,096.08	9,640.13	9,576.12	20.25	21.29	-170.88	233.72	219.68	710.92	679.99	30.93	22.987		
10,200.00	10,196.03	9,663.79	9,590.05	20.49	21.33	157.96	252.82	220.43	787.96	758.12	29.84	26.409		
10,300.00	10,296.00	9,684.87	9,601.66	20.71	21.37	118.17	270.41	221.04	867.63	838.78	28.85	30.073		
10,400.00	10,395.97	9,700.00	9,609.50	20.89	21.40	84.12	283.34	221.45	949.27	921.41	27.86	34.070		
10,500.00	10,495.95	9,725.00	9,621.56	21.01	21.45	60.57	305.23	222.07	1,032.74	1,005.51	27.23	37.930		
10,600.00	10,595.94	9,735.62	9,626.33	21.08	21.47	75.67	314.71	222.30	1,118.15	1,085.87	32.27	34.645		
10,700.00	10,695.63	9,750.00	9,632.46	21.11	21.51	30.15	327.72	222.60	1,203.37	1,168.58	34.80	34.583		
10,800.00	10,791.50	9,775.00	9,642.17	21.12	21.57	17.35	350.75	223.07	1,278.57	1,243.85	34.72	36.823		
10,900.00	10,880.02	9,788.91	9,647.04	21.16	21.61	16.07	363.77	223.29	1,342.66	1,308.12	34.54	38.874		
11,000.00	10,958.70	9,811.06	9,654.02	21.24	21.68	14.60	384.79	223.59	1,396.92	1,362.49	34.43	40.573		
11,100.00	11,026.51	9,825.00	9,657.91	21.37	21.72	13.45	398.17	223.75	1,441.72	1,407.41	34.32	42.011		
11,200.00	11,083.86	9,850.00	9,663.90	21.58	21.80	12.76	422.44	223.97	1,478.81	1,444.49	34.32	43.089		
11,300.00	11,126.68	9,875.00	9,668.62	21.87	21.89	12.15	446.99	224.10	1,505.03	1,470.65	34.38	43.776		
11,400.00	11,154.67	9,900.00	9,672.05	22.26	21.98	11.52	471.75	224.16	1,520.52	1,486.02	34.50	44.067		
11,500.00	11,166.33	9,925.00	9,674.18	22.74	22.08	11.32	496.66	224.13	1,523.95	1,489.25	34.69	43.929		
11,540.73	11,167.79	9,940.32	9,674.84	22.96	22.15	11.29	511.96	224.08	1,523.45	1,488.65	34.80	43.778		
11,600.00	11,169.52	9,957.51	9,675.00	23.29	22.22	11.25	529.15	223.98	1,523.85	1,488.88	34.97	43.579		
11,700.00	11,170.81	10,046.38	9,674.23	23.93	22.65	11.11	618.01	223.36	1,525.17	1,489.79	35.37	43.116		
11,800.00	11,170.08	10,146.35	9,673.36	24.63	23.21	11.02	717.98	222.66	1,524.86	1,489.00	35.86	42.520		
11,900.00	11,168.76	10,246.35	9,672.48	25.39	23.84	11.00	817.97	221.96	1,524.34	1,487.91	36.43	41.843		
12,000.00	11,167.38	10,346.35	9,671.61	26.22	24.54	11.02	917.96	221.26	1,523.93	1,486.86	37.07	41.110		
12,100.00	11,166.10	10,446.34	9,670.74	27.09	25.30	11.03	1,017.95	220.56	1,523.56	1,485.79	37.77	40.335		
12,200.00	11,164.16	10,546.34	9,669.86	28.02	26.12	11.02	1,117.94	219.87	1,522.45	1,483.92	38.53	39.511		
12,269.63	11,163.09	10,615.96	9,669.26	28.69	26.72	11.05	1,187.56	219.38	1,522.17	1,483.07	39.10	38.929		
12,300.00	11,163.16	10,646.31	9,668.99	28.98	26.99	11.08	1,217.91	219.17	1,522.72	1,483.36	39.36	38.686		
12,400.00	11,160.99	10,746.27	9,668.12	29.99	27.91	11.19	1,317.86	218.47	1,521.96	1,481.72	40.25	37.816		
12,500.00	11,158.27	10,846.22	9,667.25	31.03	28.88	11.31	1,417.80	217.77	1,520.67	1,479.49	41.18	36.927		
12,600.00	11,155.45	10,946.17	9,666.38	32.11	29.88	11.42	1,517.74	217.07	1,519.26	1,477.10	42.16	36.035		
12,700.00	11,152.55	11,046.13	9,665.50	33.21	30.91	11.50	1,617.70	216.38	1,517.61	1,474.44	43.18	35.148		
12,800.00	11,149.73	11,146.10	9,664.63	34.34	31.98	11.56	1,717.67	215.68	1,515.93	1,471.70	44.23	34.274		
12,900.00	11,147.73	11,246.10	9,663.76	35.49	33.08	11.58	1,817.65	214.98	1,514.88	1,469.57	45.31	33.434		
13,000.00	11,146.16	11,346.09	9,662.89	36.66	34.20	11.58	1,917.64	214.28	1,514.10	1,467.69	46.42	32.620		
13,100.00	11,143.37	11,446.06	9,662.01	37.84	35.35	11.53	2,017.60	213.58	1,511.89	1,464.35	47.54	31.802		
13,200.00	11,141.36	11,546.04	9,661.14	39.04	36.52	11.50	2,117.58	212.89	1,510.60	1,461.90	48.70	31.018		
13,300.00	11,140.35	11,646.04	9,660.27	40.27	37.71	11.51	2,217.58	212.19	1,510.52	1,460.62	49.90	30.273		
13,324.44	11,140.12	11,670.49	9,660.05	40.57	38.00	11.51	2,242.02	212.02	1,510.51	1,460.32	50.19	30.094		
13,400.00	11,139.55	11,746.04	9,659.40	41.50	38.91	11.51	2,317.57	211.49	1,510.56	1,459.45	51.11	29.554		
13,500.00	11,139.16	11,846.04	9,658.52	42.75	40.13	11.48	2,417.56	210.79	1,510.87	1,458.53	52.34	28.865		
13,600.00	11,138.10	11,946.04	9,657.65	44.01	41.37	11.46	2,517.55	210.09	1,510.65	1,457.05	53.60	28.184		
13,700.00	11,136.36	12,046.03	9,656.78	45.28	42.61	11.47	2,617.54	209.40	1,509.80	1,454.92	54.88	27.511		
13,800.00	11,134.44	12,146.02	9,655.91	46.56	43.87	11.44	2,717.52	208.70	1,508.54	1,452.38	56.16	26.860		
13,900.00	11,131.99	12,246.01	9,655.03	47.85	45.15	11.45	2,817.50	208.00	1,507.02	1,449.54	57.48	26.218		
14,000.00	11,129.35	12,345.99	9,654.16	49.15	46.43	11.47	2,917.48	207.30	1,505.30	1,446.49	58.81	25.595		
14,100.00	11,127.30	12,445.98	9,653.29	50.46	47.72	11.45	3,017.46	206.60	1,504.00	1,443.85	60.15	25.004		
14,200.00	11,125.53	12,545.97	9,652.41	51.78	49.02	11.48	3,117.45	205.91	1,503.27	1,441.75	61.52	24.436		
14,300.00	11,123.66	12,645.97	9,651.54	53.10	50.32	11.48	3,217.44	205.21	1,502.21	1,439.32	62.89	23.888		
14,400.00	11,121.94	12,745.95	9,650.67	54.42	51.64	11.43	3,317.41	204.51	1,501.06	1,436.82	64.25	23.364		
14,500.00	11,120.47	12,845.93	9,649.80	55.75	52.96	11.36	3,417.39	203.81	1,500.09	1,434.48	65.61	22.864		
14,600.00	11,118.28	12,945.91	9,648.92	57.09	54.29	11.33	3,517.37	203.11	1,498.61	1,431.61	67.00	22.367		
14,700.00	11,115.63	13,045.90	9,648.05	58.43	55.62	11.32	3,617.34	202.42	1,496.70	1,428.30	68.40	21.880		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 103H - OH - Plan 1 09-05-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9202-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	
14,800.00	11,113.90	13,145.89	9,647.18	59.78	56.96	11.29	3,717.33	201.72	1,495.72	1,425.91	69.82	21.424		
14,900.00	11,112.44	13,245.88	9,646.31	61.13	58.31	11.30	3,817.31	201.02	1,495.19	1,423.94	71.25	20.985		
15,000.00	11,107.78	13,345.78	9,645.44	62.49	59.65	11.41	3,917.21	200.32	1,491.89	1,419.16	72.74	20.511		
15,100.00	11,100.29	13,445.52	9,644.57	63.86	61.00	11.58	4,016.94	199.63	1,485.98	1,411.73	74.26	20.012		
15,200.00	11,093.78	13,545.33	9,643.69	65.23	62.36	11.70	4,116.74	198.93	1,480.89	1,405.12	75.77	19.544		
15,300.00	11,090.64	13,645.29	9,642.82	66.60	63.72	11.75	4,216.70	198.23	1,478.89	1,401.62	77.27	19.140		
15,400.00	11,088.46	13,745.28	9,641.95	67.97	65.08	11.77	4,316.68	197.53	1,477.64	1,398.89	78.75	18.764		
15,500.00	11,085.18	13,845.25	9,641.08	69.34	66.45	11.75	4,416.64	196.84	1,475.02	1,394.81	80.21	18.389		
15,600.00	11,082.81	13,945.23	9,640.20	70.72	67.82	11.74	4,516.62	196.14	1,473.52	1,391.82	81.70	18.036		
15,700.00	11,080.37	14,045.22	9,639.33	72.10	69.20	11.77	4,616.60	195.44	1,472.05	1,388.84	83.21	17.692		
15,800.00	11,077.84	14,145.20	9,638.46	73.48	70.58	11.76	4,716.58	194.74	1,470.29	1,385.60	84.69	17.360		
15,859.00	11,076.45	14,204.19	9,637.94	74.30	71.39	11.75	4,775.56	194.33	1,469.30	1,383.73	85.57	17.171		



Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 202 H - OH - Plan 1 08-29-17												Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10073-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
0.00	0.00	1.00	0.00	0.00	0.00	-87.34	47.30	-1,019.56	1,020.65				
100.00	100.00	101.00	100.00	0.14	0.10	87.55	47.30	-1,019.56	1,020.67	1,020.43	0.24	4,295.521	
200.00	200.00	201.00	200.00	0.40	0.37	78.72	47.30	-1,019.56	1,020.61	1,019.85	0.76	1,338.478	
300.00	300.00	301.00	300.00	0.66	0.63	86.13	47.30	-1,019.56	1,020.58	1,019.29	1.29	790.315	
400.00	400.00	401.00	400.00	0.91	0.90	56.63	47.30	-1,019.56	1,020.52	1,018.71	1.81	563.439	
500.00	500.00	501.00	500.00	1.16	1.16	67.28	47.30	-1,019.56	1,020.34	1,018.02	2.32	439.478	
600.00	600.00	601.00	600.00	1.42	1.43	81.65	47.30	-1,019.56	1,020.27	1,017.42	2.84	358.672	
700.00	700.00	701.00	700.00	1.68	1.69	77.40	47.30	-1,019.56	1,020.22	1,016.85	3.37	302.305	
800.00	800.00	801.00	800.00	1.95	1.96	79.35	47.30	-1,019.56	1,020.13	1,016.23	3.91	261.213	
900.00	900.00	901.00	900.00	2.21	2.22	65.76	47.30	-1,019.56	1,020.06	1,015.62	4.43	230.032	
1,000.00	1,000.00	1,001.00	1,000.00	2.47	2.49	67.76	47.30	-1,019.56	1,019.93	1,014.97	4.96	205.513	
1,100.00	1,100.00	1,101.00	1,100.00	2.73	2.76	45.47	47.30	-1,019.56	1,019.84	1,014.36	5.48	185.989	
1,200.00	1,200.00	1,201.00	1,200.00	2.98	3.02	58.55	47.30	-1,019.56	1,019.75	1,013.74	6.00	169.893	
1,300.00	1,299.99	1,300.99	1,299.99	3.24	3.29	57.60	47.30	-1,019.56	1,019.64	1,013.11	6.53	156.164	
1,400.00	1,399.99	1,400.99	1,399.99	3.50	3.55	54.64	47.30	-1,019.56	1,019.48	1,012.42	7.06	144.489	
1,500.00	1,499.99	1,500.99	1,499.99	3.77	3.82	55.21	47.30	-1,019.56	1,019.29	1,011.71	7.58	134.431	
1,600.00	1,599.99	1,600.99	1,599.99	4.02	4.08	49.77	47.30	-1,019.56	1,019.08	1,010.97	8.11	125.698	
1,700.00	1,699.99	1,700.99	1,699.99	4.24	4.35	5.24	47.30	-1,019.56	1,018.91	1,010.32	8.59	118.602	
1,753.90	1,753.89	1,754.89	1,753.89	4.28	4.49	-90.00	47.30	-1,019.56	1,018.88	1,010.11	8.77	116.124	
1,800.00	1,799.99	1,800.99	1,799.99	4.32	4.61	-100.04	47.30	-1,019.56	1,018.91	1,009.98	8.93	114.091	
1,900.00	1,899.99	1,900.99	1,899.99	4.31	4.88	-109.89	47.30	-1,019.56	1,019.06	1,009.87	9.19	110.888	
2,000.00	1,999.99	2,000.99	1,999.99	4.32	5.14	-108.29	47.30	-1,019.56	1,019.24	1,009.78	9.46	107.706	
2,100.00	2,099.99	2,100.99	2,099.99	4.34	5.41	-107.03	47.30	-1,019.56	1,019.41	1,009.66	9.75	104.521	
2,200.00	2,199.99	2,200.99	2,199.99	4.38	5.68	-118.70	47.30	-1,019.56	1,019.62	1,009.56	10.06	101.367	
2,300.00	2,299.99	2,300.99	2,299.99	4.45	5.94	-156.58	47.30	-1,019.56	1,019.88	1,009.49	10.39	98.119	
2,400.00	2,399.98	2,400.98	2,399.98	4.57	6.21	167.32	47.30	-1,019.56	1,020.18	1,009.40	10.78	94.651	
2,500.00	2,499.98	2,500.98	2,499.98	4.71	6.47	-166.78	47.30	-1,019.56	1,020.59	1,009.41	11.18	91.304	
2,600.00	2,599.98	2,600.98	2,599.98	4.83	6.74	-165.60	47.30	-1,019.56	1,021.17	1,009.60	11.57	88.268	
2,700.00	2,699.98	2,700.98	2,699.98	4.96	7.00	-158.66	47.30	-1,019.56	1,021.97	1,010.01	11.97	85.412	
2,800.00	2,799.97	2,800.97	2,799.97	5.11	7.27	-168.82	47.30	-1,019.56	1,023.12	1,010.75	12.37	82.688	
2,900.00	2,899.96	2,900.96	2,899.96	5.26	7.53	-162.14	47.30	-1,019.56	1,024.45	1,011.66	12.79	80.079	
3,000.00	2,999.95	3,000.95	2,999.95	5.43	7.80	-173.15	47.30	-1,019.56	1,026.09	1,012.86	13.23	77.587	
3,100.00	3,099.94	3,100.94	3,099.94	5.62	8.06	126.97	47.30	-1,019.56	1,027.19	1,013.51	13.69	75.053	
3,200.00	3,199.94	3,200.94	3,199.94	5.80	8.33	-10.71	47.30	-1,019.56	1,026.96	1,012.84	14.13	72.696	
3,300.00	3,299.94	3,300.94	3,299.94	5.92	8.59	-68.15	47.30	-1,019.56	1,026.50	1,011.98	14.52	70.702	
3,400.00	3,399.93	3,400.93	3,399.93	6.04	8.86	-88.30	47.30	-1,019.56	1,026.38	1,011.48	14.90	68.882	
3,430.45	3,430.38	3,431.38	3,430.38	6.08	8.94	-90.00	47.30	-1,019.56	1,026.38	1,011.36	15.02	68.336	
3,500.00	3,499.93	3,500.93	3,499.93	6.17	9.13	-94.22	47.30	-1,019.56	1,026.39	1,011.09	15.29	67.119	
3,600.00	3,599.93	3,600.93	3,599.93	6.30	9.39	-64.66	47.30	-1,019.56	1,026.40	1,010.71	15.69	65.400	
3,700.00	3,699.93	3,700.93	3,699.93	6.45	9.66	-15.06	47.30	-1,019.56	1,025.90	1,009.79	16.11	63.681	
3,800.00	3,799.92	3,800.92	3,799.92	6.62	9.92	-1.13	47.30	-1,019.56	1,025.25	1,008.71	16.54	61.984	
3,900.00	3,899.92	3,900.92	3,899.92	6.79	10.19	5.61	47.30	-1,019.56	1,024.38	1,007.40	16.98	60.322	
4,000.00	3,999.92	4,000.92	3,999.92	6.97	10.45	-10.46	47.30	-1,019.56	1,023.41	1,005.98	17.43	58.727	
4,100.00	4,099.91	4,100.91	4,099.91	7.15	10.72	-14.36	47.30	-1,019.56	1,022.47	1,004.60	17.87	57.213	
4,200.00	4,199.90	4,200.90	4,199.90	7.34	10.98	-5.00	47.30	-1,019.56	1,021.33	1,003.01	18.32	55.742	
4,282.70	4,282.60	4,283.60	4,282.60	7.49	11.20	96.46	47.30	-1,019.56	1,020.87	1,002.17	18.70	54.597	
4,300.00	4,299.90	4,300.90	4,299.90	7.53	11.25	110.02	47.30	-1,019.56	1,020.80	1,002.02	18.78	54.365	
4,400.00	4,399.90	4,400.90	4,399.90	7.71	11.51	-23.42	47.30	-1,019.56	1,020.56	1,001.33	19.23	53.081	
4,500.00	4,499.89	4,500.89	4,499.89	7.89	11.78	-31.78	47.30	-1,019.56	1,019.57	999.89	19.67	51.821	
4,600.00	4,599.89	4,600.89	4,599.89	8.08	12.05	-28.14	47.30	-1,019.56	1,018.69	998.56	20.13	50.615	
4,700.00	4,699.88	4,700.88	4,699.88	8.27	12.31	-36.16	47.30	-1,019.56	1,017.84	997.26	20.58	49.462	
4,800.00	4,799.88	4,800.88	4,799.88	8.45	12.58	68.95	47.30	-1,019.56	1,017.52	996.49	21.03	48.382	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 202 H - OH - Plan 1 08-29-17													Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 10073-MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,899.87	4,900.87	4,899.87	8.65	12.84	-32.72	47.30	-1,019.56	1,016.84	995.35	21.49	47.321		
5,000.00	4,999.87	5,000.87	4,999.87	8.84	13.11	-36.15	47.30	-1,019.56	1,015.95	994.01	21.95	46.293		
5,100.00	5,099.86	5,100.86	5,099.86	9.03	13.37	-36.49	47.30	-1,019.56	1,015.17	992.77	22.41	45.305		
5,200.00	5,199.86	5,200.86	5,199.86	9.23	13.64	-49.91	47.30	-1,019.56	1,014.37	991.51	22.87	44.358		
5,300.00	5,299.85	5,300.85	5,299.85	9.42	13.90	-41.98	47.30	-1,019.56	1,013.71	990.38	23.33	43.454		
5,400.00	5,399.85	5,400.85	5,399.85	9.63	14.17	-21.66	47.30	-1,019.56	1,012.84	989.04	23.80	42.555		
5,500.00	5,499.85	5,500.85	5,499.85	9.85	14.43	4.93	47.30	-1,019.56	1,012.40	988.12	24.28	41.694		
5,554.43	5,554.27	5,555.27	5,554.27	9.95	14.58	90.00	47.30	-1,019.56	1,012.32	987.79	24.53	41.274		
5,600.00	5,599.85	5,600.85	5,599.85	10.03	14.70	143.59	47.30	-1,019.56	1,012.33	987.60	24.73	40.932		
5,700.00	5,699.84	5,700.84	5,699.84	10.19	14.97	89.71	47.30	-1,019.56	1,012.57	987.41	25.16	40.250		
5,800.00	5,799.84	5,800.84	5,799.84	10.37	15.23	78.16	47.30	-1,019.56	1,012.48	986.87	25.60	39.543		
5,900.00	5,899.84	5,900.84	5,899.84	10.56	15.50	79.70	47.30	-1,019.56	1,012.39	986.33	26.06	38.849		
6,000.00	5,999.83	6,000.83	5,999.83	10.76	15.76	74.61	47.30	-1,019.56	1,011.98	985.46	26.52	38.160		
6,100.00	6,099.75	6,100.75	6,099.75	10.96	16.03	73.06	47.30	-1,019.56	1,010.90	983.91	26.98	37.463		
6,200.00	6,199.65	6,200.65	6,199.65	11.16	16.29	70.50	47.30	-1,019.56	1,009.48	982.03	27.45	36.771		
6,300.00	6,299.55	6,300.55	6,299.55	11.37	16.56	71.64	47.30	-1,019.56	1,008.04	980.12	27.93	36.097		
6,400.00	6,399.46	6,400.46	6,399.46	11.58	16.82	70.64	47.30	-1,019.56	1,006.63	978.23	28.40	35.443		
6,500.00	6,499.38	6,500.38	6,499.38	11.79	17.09	71.75	47.30	-1,019.56	1,005.37	976.49	28.88	34.814		
6,600.00	6,599.32	6,600.32	6,599.32	12.01	17.35	73.71	47.30	-1,019.56	1,004.29	974.93	29.36	34.209		
6,700.00	6,699.26	6,700.26	6,699.26	12.22	17.62	76.07	47.30	-1,019.56	1,003.48	973.64	29.84	33.632		
6,800.00	6,799.17	6,800.17	6,799.17	12.44	17.88	71.91	47.30	-1,019.56	1,002.33	972.01	30.32	33.059		
6,900.00	6,899.07	6,900.07	6,899.07	12.66	18.15	71.53	47.30	-1,019.56	1,000.83	970.02	30.81	32.489		
7,000.00	6,998.97	6,999.97	6,998.97	12.88	18.41	69.80	47.30	-1,019.56	999.43	968.13	31.29	31.937		
7,100.00	7,098.86	7,099.86	7,098.86	13.11	18.68	65.75	47.30	-1,019.56	997.67	965.89	31.79	31.388		
7,200.00	7,198.77	7,199.77	7,198.77	13.34	18.94	68.94	47.30	-1,019.56	995.94	963.66	32.28	30.854		
7,300.00	7,298.67	7,299.67	7,298.67	13.56	19.21	81.46	47.30	-1,019.56	994.78	962.01	32.77	30.357		
7,400.00	7,398.55	7,399.55	7,398.55	13.78	19.47	82.09	47.30	-1,019.56	994.18	960.92	33.26	29.893		
7,500.00	7,498.44	7,499.44	7,498.44	14.01	19.74	69.05	47.30	-1,019.56	993.04	959.28	33.75	29.422		
7,600.00	7,598.30	7,599.30	7,598.30	14.25	20.00	71.04	47.30	-1,019.56	991.15	956.90	34.25	28.939		
7,700.00	7,698.13	7,699.13	7,698.13	14.48	20.27	67.82	47.30	-1,019.56	989.11	954.36	34.75	28.464		
7,800.00	7,797.98	7,798.98	7,797.98	14.72	20.53	68.61	47.30	-1,019.56	987.06	951.81	35.25	28.001		
7,900.00	7,897.86	7,898.86	7,897.86	14.96	20.80	70.27	47.30	-1,019.56	985.32	949.57	35.75	27.558		
8,000.00	7,997.77	7,998.77	7,997.77	15.19	21.07	72.02	47.30	-1,019.56	984.04	947.79	36.26	27.141		
8,100.00	8,097.70	8,098.70	8,097.70	15.43	21.33	69.80	47.30	-1,019.56	982.79	946.03	36.76	26.735		
8,200.00	8,197.64	8,198.64	8,197.64	15.67	21.60	73.67	47.30	-1,019.56	981.61	944.34	37.26	26.341		
8,257.95	8,255.55	8,248.58	8,247.58	15.81	21.69	78.32	47.27	-1,019.76	981.30	943.81	37.49	26.173 CC, ES		
8,300.00	8,297.56	8,284.69	8,283.69	15.91	21.75	81.20	47.20	-1,020.17	981.48	943.83	37.66	26.065		
8,400.00	8,397.45	8,370.52	8,369.50	16.15	21.84	84.20	46.90	-1,022.06	983.07	945.09	37.98	25.887		
8,500.00	8,497.32	8,456.32	8,455.23	16.38	21.93	85.70	46.41	-1,025.22	986.15	947.87	38.28	25.763		
8,600.00	8,597.19	8,542.04	8,540.84	16.62	22.01	87.62	45.71	-1,029.64	990.85	952.28	38.57	25.688		
8,700.00	8,697.07	8,627.65	8,626.26	16.85	22.10	90.44	44.81	-1,035.31	997.14	958.28	38.86	25.659		
8,800.00	8,796.96	8,715.88	8,714.18	17.09	22.19	88.37	43.68	-1,042.45	1,004.97	965.81	39.16	25.665		
8,900.00	8,896.87	8,815.56	8,813.49	17.33	22.29	75.33	42.33	-1,050.97	1,012.72	973.22	39.50	25.637		
9,000.00	8,996.80	8,915.29	8,912.85	17.57	22.40	80.14	40.98	-1,059.49	1,020.06	980.21	39.85	25.596		
9,100.00	9,096.75	9,015.02	9,012.21	17.82	22.51	61.46	39.63	-1,068.02	1,027.35	987.14	40.21	25.551		
9,200.00	9,196.70	9,114.83	9,111.64	18.06	22.63	32.16	38.28	-1,076.55	1,033.50	992.94	40.56	25.479		
9,300.00	9,296.64	9,214.68	9,211.11	18.30	22.74	40.57	36.93	-1,085.09	1,038.99	998.07	40.92	25.393		
9,400.00	9,396.58	9,314.50	9,310.56	18.54	22.86	59.52	35.58	-1,093.62	1,044.94	1,003.66	41.28	25.313		
9,500.00	9,496.53	9,414.27	9,409.96	18.79	22.99	65.05	34.23	-1,102.15	1,051.65	1,010.00	41.65	25.250		
9,600.00	9,596.47	9,513.96	9,509.28	19.03	23.11	89.78	32.89	-1,110.67	1,059.42	1,017.40	42.02	25.215		
9,700.00	9,696.39	9,613.62	9,608.56	19.27	23.24	90.01	31.54	-1,119.19	1,067.64	1,025.26	42.38	25.192		
9,800.00	9,796.32	9,713.27	9,707.84	19.51	23.37	89.64	30.19	-1,127.71	1,075.89	1,033.14	42.75	25.169		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design										Black & Tan 27 Federal Com - 202 H - OH - Plan 1 08-29-17				Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 10073-MWD+HDGM														Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Minimum Separation (usft)	Separation Factor		
9,900.00	9,896.23	9,812.93	9,807.12	19.75	23.50	87.84	28.84	-1,136.23	1,084.01	1,040.89	43.12	25.140			
10,000.00	9,996.15	9,912.60	9,906.42	20.00	23.63	84.99	27.49	-1,144.75	1,092.02	1,048.52	43.49	25.107			
10,100.00	10,096.08	10,012.31	10,005.75	20.25	23.77	71.06	26.15	-1,153.28	1,099.63	1,055.75	43.88	25.062			
10,200.00	10,196.03	10,100.00	10,093.10	20.49	23.85	42.29	26.24	-1,160.78	1,106.52	1,062.35	44.17	25.054			
10,300.00	10,296.00	10,168.71	10,160.90	20.71	23.86	4.80	35.25	-1,166.68	1,115.03	1,070.76	44.28	25.183			
10,400.00	10,395.97	10,234.94	10,224.38	20.89	23.87	-27.57	53.09	-1,172.27	1,126.51	1,082.21	44.30	25.429			
10,500.00	10,495.95	10,300.00	10,283.75	21.01	23.89	-49.16	79.03	-1,177.57	1,142.02	1,097.78	44.24	25.816			
10,600.00	10,595.94	10,350.00	10,326.68	21.08	23.91	-32.55	104.33	-1,181.45	1,161.86	1,117.63	44.24	26.263			
10,700.00	10,695.63	10,400.00	10,366.73	21.11	23.93	-67.60	134.00	-1,185.12	1,184.54	1,140.30	44.24	26.777			
10,800.00	10,791.50	10,450.00	10,403.46	21.12	23.96	-72.60	167.71	-1,188.54	1,206.77	1,162.70	44.06	27.387			
10,900.00	10,880.02	10,500.00	10,436.48	21.16	24.02	-67.54	205.10	-1,191.67	1,228.63	1,184.70	43.93	27.968			
11,000.00	10,958.70	10,550.00	10,465.43	21.24	24.09	-64.44	245.74	-1,194.47	1,245.21	1,201.35	43.85	28.395			
11,100.00	11,026.51	10,592.88	10,486.76	21.37	24.17	-63.36	282.86	-1,196.59	1,259.17	1,215.33	43.84	28.722			
11,200.00	11,083.86	10,640.49	10,506.46	21.58	24.28	-61.80	326.13	-1,198.61	1,270.93	1,226.99	43.95	28.919			
11,300.00	11,126.68	10,687.89	10,521.70	21.87	24.41	-60.94	370.97	-1,200.27	1,278.41	1,234.22	44.19	28.929			
11,400.00	11,154.67	10,735.15	10,532.42	22.26	24.55	-61.03	416.96	-1,201.55	1,283.75	1,239.16	44.59	28.791			
11,500.00	11,166.33	10,782.34	10,538.55	22.74	24.71	-60.87	463.72	-1,202.43	1,288.14	1,242.99	45.15	28.530			
11,600.00	11,169.52	10,834.38	10,540.02	23.29	24.92	-60.91	515.71	-1,202.96	1,293.05	1,247.20	45.84	28.207			
11,700.00	11,170.81	10,934.27	10,539.15	23.93	25.37	-60.85	615.60	-1,203.66	1,297.55	1,250.77	46.78	27.738			
11,800.00	11,170.08	11,034.24	10,538.28	24.63	25.89	-60.90	715.56	-1,204.36	1,299.64	1,251.80	47.84	27.164			
11,900.00	11,168.76	11,134.24	10,537.41	25.39	26.47	-60.94	815.55	-1,205.06	1,299.83	1,250.80	49.03	26.513			
12,000.00	11,167.38	11,234.24	10,536.53	26.22	27.13	-60.95	915.55	-1,205.75	1,299.17	1,248.86	50.32	25.820			
12,100.00	11,166.10	11,334.23	10,535.66	27.09	27.84	-60.96	1,015.54	-1,206.45	1,298.81	1,247.10	51.71	25.118			
12,200.00	11,164.16	11,434.23	10,534.79	28.02	28.60	-61.01	1,115.53	-1,207.15	1,298.56	1,245.35	53.21	24.407			
12,300.00	11,163.16	11,534.20	10,533.92	28.98	29.42	-60.98	1,215.49	-1,207.85	1,296.70	1,241.93	54.77	23.676			
12,400.00	11,160.99	11,634.16	10,533.04	29.99	30.29	-60.99	1,315.44	-1,208.55	1,293.76	1,237.34	56.42	22.930			
12,500.00	11,158.27	11,734.11	10,532.17	31.03	31.19	-61.01	1,415.39	-1,209.24	1,290.52	1,232.37	58.15	22.193			
12,600.00	11,155.45	11,834.06	10,531.30	32.11	32.14	-61.03	1,515.33	-1,209.94	1,287.39	1,227.44	59.95	21.474			
12,700.00	11,152.55	11,934.02	10,530.43	33.21	33.12	-61.06	1,615.29	-1,210.64	1,284.88	1,223.07	61.82	20.786			
12,800.00	11,149.73	12,033.99	10,529.56	34.34	34.14	-61.10	1,715.25	-1,211.34	1,282.97	1,219.22	63.74	20.127			
12,900.00	11,147.73	12,133.99	10,528.68	35.49	35.19	-61.13	1,815.24	-1,212.04	1,282.14	1,216.43	65.72	19.510			
12,942.73	11,147.08	12,176.71	10,528.31	35.99	35.64	-61.14	1,857.97	-1,212.33	1,282.08	1,215.51	66.57	19.258			
13,000.00	11,146.16	12,233.98	10,527.81	36.66	36.26	-61.15	1,915.23	-1,212.73	1,282.24	1,214.50	67.74	18.930			
13,100.00	11,143.37	12,333.95	10,526.94	37.84	37.36	-61.25	2,015.19	-1,213.43	1,282.79	1,212.97	69.82	18.372			
13,200.00	11,141.36	12,433.93	10,526.07	39.04	38.48	-61.34	2,115.17	-1,214.13	1,283.03	1,211.10	71.94	17.836			
13,300.00	11,140.35	12,533.93	10,525.19	40.27	39.62	-61.34	2,215.16	-1,214.83	1,282.71	1,208.65	74.06	17.319			
13,329.24	11,140.08	12,563.17	10,524.94	40.63	39.96	-61.34	2,244.40	-1,215.03	1,282.68	1,207.99	74.69	17.172			
13,400.00	11,139.55	12,633.93	10,524.32	41.50	40.79	-61.34	2,315.16	-1,215.53	1,282.86	1,206.63	76.22	16.830			
13,500.00	11,139.16	12,733.93	10,523.45	42.75	41.96	-61.34	2,415.14	-1,216.22	1,283.82	1,205.40	78.41	16.372			
13,600.00	11,138.10	12,833.93	10,522.57	44.01	43.16	-61.35	2,515.14	-1,216.92	1,283.88	1,203.25	80.64	15.922			
13,700.00	11,136.36	12,933.92	10,521.70	45.28	44.37	-61.38	2,615.13	-1,217.62	1,283.49	1,200.60	82.89	15.484			
13,703.49	11,136.29	12,937.41	10,521.67	45.33	44.41	-61.38	2,618.61	-1,217.64	1,283.49	1,200.52	82.97	15.469			
13,800.00	11,134.44	13,033.91	10,520.83	46.56	45.59	-61.44	2,715.11	-1,218.32	1,283.99	1,198.80	85.19	15.072			
13,900.00	11,131.99	13,133.90	10,519.96	47.85	46.83	-61.52	2,815.09	-1,219.02	1,283.16	1,195.65	87.51	14.664			
14,000.00	11,129.35	13,233.88	10,519.08	49.15	48.08	-61.58	2,915.06	-1,219.71	1,282.27	1,192.42	89.85	14.272			
14,066.77	11,127.87	13,300.64	10,518.50	50.03	48.92	-61.62	2,981.83	-1,220.18	1,282.02	1,190.60	91.42	14.023			
14,100.00	11,127.30	13,333.87	10,518.21	50.46	49.34	-61.64	3,015.05	-1,220.41	1,282.31	1,190.10	92.21	13.907			
14,200.00	11,125.53	13,433.86	10,517.34	51.78	50.61	-61.66	3,115.04	-1,221.11	1,281.25	1,186.69	94.56	13.549			
14,262.86	11,124.38	13,496.72	10,516.79	52.61	51.41	-61.68	3,177.89	-1,221.55	1,281.00	1,184.94	96.06	13.335			
14,300.00	11,123.66	13,533.86	10,516.47	53.10	51.89	-61.70	3,215.02	-1,221.81	1,281.14	1,184.18	96.95	13.214			
14,400.00	11,121.94	13,633.84	10,515.59	54.42	53.17	-61.75	3,315.00	-1,222.51	1,282.13	1,182.77	99.36	12.903			
14,500.00	11,120.47	13,733.82	10,514.72	55.75	54.47	-61.83	3,414.97	-1,223.20	1,283.58	1,181.79	101.79	12.610			

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 202 H - OH - Plan 1 08-29-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10073-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		
14,600.00	11,118.28	13,833.80	10,513.85	57.09	55.77	-61.90	3,514.95	-1,223.90	1,283.83	1,179.59	104.24	12.316		
14,700.00	11,115.63	13,933.78	10,512.98	58.43	57.08	-61.99	3,614.93	-1,224.60	1,283.69	1,176.99	106.71	12.030		
14,708.56	11,115.42	13,942.34	10,512.90	58.54	57.19	-62.00	3,623.48	-1,224.66	1,283.69	1,176.77	106.92	12.006		
14,800.00	11,113.90	14,033.78	10,512.10	59.78	58.39	-62.04	3,714.91	-1,225.30	1,283.94	1,174.77	109.17	11.761		
14,900.00	11,112.44	14,133.77	10,511.23	61.13	59.71	-62.09	3,814.90	-1,226.00	1,283.47	1,171.85	111.62	11.499		
15,000.00	11,107.78	14,233.67	10,510.36	62.49	61.04	-62.29	3,914.79	-1,226.69	1,279.83	1,165.69	114.14	11.213		
15,100.00	11,100.29	14,333.41	10,509.49	63.86	62.37	-62.54	4,014.52	-1,227.39	1,274.17	1,157.43	116.74	10.915		
15,200.00	11,093.78	14,433.22	10,508.62	65.23	63.70	-62.60	4,114.33	-1,228.09	1,269.66	1,150.33	119.33	10.640		
15,300.00	11,090.64	14,533.18	10,507.75	66.60	65.05	-62.63	4,214.29	-1,228.78	1,267.70	1,145.83	121.87	10.402		
15,400.00	11,088.46	14,633.17	10,506.87	67.97	66.39	-62.67	4,314.27	-1,229.48	1,266.98	1,142.59	124.39	10.185		
15,484.31	11,086.02	14,717.46	10,506.14	69.13	67.53	-62.74	4,398.55	-1,230.07	1,266.81	1,140.25	126.56	10.010		
15,500.00	11,085.18	14,733.13	10,506.00	69.34	67.74	-62.78	4,414.23	-1,230.18	1,266.98	1,140.00	126.98	9.978		
15,600.00	11,082.81	14,833.12	10,505.13	70.72	69.10	-62.87	4,514.21	-1,230.88	1,266.48	1,136.94	129.54	9.777		
15,700.00	11,080.37	14,933.11	10,504.26	72.10	70.45	-62.92	4,614.19	-1,231.58	1,265.48	1,133.38	132.10	9.580		
15,769.96	11,078.61	15,003.06	10,503.65	73.07	71.40	-62.96	4,684.13	-1,232.06	1,265.22	1,131.32	133.90	9.449		
15,800.00	11,077.84	15,033.09	10,503.38	73.48	71.81	-62.99	4,714.16	-1,232.27	1,265.31	1,130.63	134.68	9.395		
15,859.00	11,076.45	15,092.08	10,502.87	74.30	72.62	-63.03	4,773.15	-1,232.69	1,265.50	1,129.29	136.21	9.291 SF		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 203H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft
Survey Program: 0-NS-GYRO-MS, 10044-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)	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	-0.80	55.04	-0.77	55.05				
100.00	100.00	100.00	100.00	0.14	0.10	174.08	55.04	-0.77	55.15	54.92	0.23	234.706	
200.00	200.00	200.00	200.00	0.40	0.36	165.31	55.04	-0.77	55.37	54.61	0.76	72.874	
300.00	300.00	300.00	300.00	0.66	0.63	172.76	55.04	-0.77	55.75	54.46	1.29	43.263	
400.00	400.00	400.00	400.00	0.91	0.89	143.31	55.04	-0.77	56.01	54.20	1.81	30.969	
500.00	500.00	500.00	500.00	1.16	1.16	154.14	55.04	-0.77	56.21	53.89	2.32	24.240	
600.00	600.00	600.00	600.00	1.42	1.43	168.59	55.04	-0.77	56.58	53.74	2.84	19.911	
700.00	700.00	700.00	700.00	1.68	1.69	164.39	55.04	-0.77	56.85	53.48	3.37	16.858	
800.00	800.00	800.00	800.00	1.95	1.96	166.43	55.04	-0.77	57.24	53.33	3.90	14.666	
900.00	900.00	900.00	900.00	2.21	2.22	152.91	55.04	-0.77	57.50	53.07	4.43	12.975	
1,000.00	1,000.00	1,000.00	1,000.00	2.47	2.49	155.03	55.04	-0.77	57.76	52.80	4.96	11.645	
1,100.00	1,100.00	1,100.00	1,100.00	2.73	2.75	132.83	55.04	-0.77	57.93	52.45	5.48	10.571	
1,200.00	1,200.00	1,200.00	1,200.00	2.98	3.02	146.00	55.04	-0.77	58.05	52.05	6.00	9.676	
1,300.00	1,299.99	1,299.99	1,299.99	3.24	3.28	145.15	55.04	-0.77	58.22	51.69	6.53	8.920	
1,400.00	1,399.99	1,399.99	1,399.99	3.50	3.55	142.35	55.04	-0.77	58.44	51.39	7.05	8.286	
1,500.00	1,499.99	1,499.99	1,499.99	3.77	3.81	143.10	55.04	-0.77	58.72	51.14	7.58	7.747	
1,600.00	1,599.99	1,599.99	1,599.99	4.02	4.08	137.86	55.04	-0.77	58.97	50.87	8.10	7.276	
1,700.00	1,699.99	1,699.99	1,699.99	4.24	4.35	93.49	55.04	-0.77	59.17	50.58	8.59	6.889	
1,800.00	1,799.99	1,799.99	1,799.99	4.32	4.61	-11.78	55.04	-0.77	58.86	49.93	8.93	6.592	
1,900.00	1,899.99	1,899.99	1,899.99	4.31	4.88	-21.77	55.04	-0.77	58.34	49.15	9.19	6.350	
2,000.00	1,999.99	1,999.99	1,999.99	4.32	5.14	-20.33	55.04	-0.77	57.88	48.42	9.46	6.118	
2,100.00	2,099.99	2,099.99	2,099.99	4.34	5.41	-19.23	55.04	-0.77	57.29	47.54	9.75	5.876	
2,200.00	2,199.99	2,199.99	2,199.99	4.38	5.67	-31.10	55.04	-0.77	56.74	46.69	10.06	5.643	
2,300.00	2,299.99	2,299.99	2,299.99	4.45	5.94	-69.24	55.04	-0.77	56.48	46.08	10.39	5.435	
2,352.53	2,352.51	2,352.51	2,352.51	4.52	6.08	-90.08	55.04	-0.77	56.45	45.85	10.59	5.329	
2,400.00	2,399.98	2,399.98	2,399.98	4.57	6.20	-105.65	55.04	-0.77	56.49	45.71	10.78	5.242	
2,500.00	2,499.98	2,499.98	2,499.98	4.71	6.47	-80.17	55.04	-0.77	56.53	45.36	11.18	5.059	
2,600.00	2,599.98	2,599.98	2,599.98	4.83	6.73	-79.57	55.04	-0.77	56.41	44.84	11.57	4.877	
2,700.00	2,699.98	2,699.98	2,699.98	4.96	7.00	-73.46	55.04	-0.77	56.21	44.25	11.96	4.699	
2,800.00	2,799.97	2,799.97	2,799.97	5.11	7.27	-84.80	55.04	-0.77	55.99	43.62	12.37	4.526	
2,900.00	2,899.96	2,899.96	2,899.96	5.26	7.53	-79.49	55.04	-0.77	55.79	43.00	12.79	4.362	
2,987.46	2,987.41	2,987.41	2,987.41	5.41	7.76	-90.75	55.04	-0.77	55.69	42.52	13.17	4.229	
3,000.00	2,999.95	2,999.95	2,999.95	5.43	7.80	-92.20	55.04	-0.77	55.66	42.43	13.22	4.209	
3,100.00	3,099.94	3,099.94	3,099.94	5.62	8.06	-153.15	55.04	-0.77	56.15	42.47	13.68	4.104	
3,200.00	3,199.94	3,199.94	3,199.94	5.80	8.33	69.42	55.04	-0.77	56.37	42.25	14.12	3.991	
3,300.00	3,299.94	3,299.94	3,299.94	5.92	8.59	12.39	55.04	-0.77	55.78	41.27	14.52	3.843	
3,400.00	3,399.93	3,399.93	3,399.93	6.04	8.86	-7.73	55.04	-0.77	55.04	40.14	14.90	3.695	
3,500.00	3,499.93	3,499.93	3,499.93	6.17	9.12	-13.73	55.04	-0.77	54.39	39.10	15.29	3.557	
3,600.00	3,599.93	3,599.93	3,599.93	6.30	9.39	15.74	55.04	-0.77	53.80	38.11	15.69	3.429	
3,700.00	3,699.93	3,699.93	3,699.93	6.45	9.65	65.83	55.04	-0.77	53.40	37.29	16.11	3.315	
3,800.00	3,799.92	3,799.92	3,799.92	6.62	9.92	80.45	55.04	-0.77	53.25	36.71	16.54	3.220	
3,900.00	3,899.92	3,899.92	3,899.92	6.79	10.18	88.12	55.04	-0.77	53.15	36.18	16.98	3.131	
4,000.00	3,999.92	3,999.92	3,999.92	6.97	10.45	73.10	55.04	-0.77	53.06	35.64	17.42	3.045	
4,100.00	4,099.91	4,099.91	4,099.91	7.15	10.72	70.19	55.04	-0.77	52.71	34.84	17.87	2.950	
4,200.00	4,199.90	4,199.90	4,199.90	7.34	10.98	80.77	55.04	-0.77	52.41	34.09	18.32	2.861	
4,215.80	4,215.70	4,215.70	4,215.70	7.37	11.02	90.05	55.04	-0.77	52.40	34.01	18.39	2.849	
4,300.00	4,299.90	4,299.90	4,299.90	7.53	11.25	-163.62	55.04	-0.77	52.77	34.00	18.77	2.811	
4,400.00	4,399.90	4,399.90	4,399.90	7.71	11.51	63.21	55.04	-0.77	53.11	33.89	19.22	2.763	
4,500.00	4,499.89	4,499.89	4,499.89	7.89	11.78	55.93	55.04	-0.77	52.54	32.87	19.67	2.671	
4,600.00	4,599.89	4,599.89	4,599.89	8.08	12.04	60.54	55.04	-0.77	52.03	31.91	20.12	2.586	
4,700.00	4,699.88	4,699.88	4,699.88	8.27	12.31	53.49	55.04	-0.77	51.36	30.78	20.58	2.496	
4,744.76	4,744.64	4,744.64	4,744.64	8.35	12.43	90.00	55.04	-0.77	51.24	30.46	20.78	2.466	

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 203H - OH - Plan 1 09-05-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10044-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Between		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)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor		
4,800.00	4,799.88	4,799.88	4,799.88	8.45	12.57	158.93	55.04	-0.77	51.74	30.71	21.03	2.461		
4,900.00	4,899.87	4,899.87	4,899.87	8.65	12.84	58.03	55.04	-0.77	51.62	30.13	21.49	2.402		
5,000.00	4,999.87	4,999.87	4,999.87	8.84	13.10	55.63	55.04	-0.77	51.01	29.06	21.94	2.325		
5,100.00	5,099.86	5,099.86	5,099.86	9.03	13.37	56.23	55.04	-0.77	50.48	28.08	22.40	2.253		
5,200.00	5,199.86	5,199.86	5,199.86	9.23	13.64	43.81	55.04	-0.77	49.84	26.97	22.87	2.180		
5,300.00	5,299.85	5,299.85	5,299.85	9.42	13.90	52.64	55.04	-0.77	48.99	25.66	23.33	2.100		
5,400.00	5,399.85	5,399.85	5,399.85	9.63	14.17	74.05	55.04	-0.77	48.59	24.79	23.80	2.042		
5,476.78	5,476.62	5,476.62	5,476.62	9.80	14.37	90.00	55.04	-0.77	48.52	24.35	24.17	2.008	CC	
5,500.00	5,499.85	5,499.85	5,499.85	9.85	14.43	101.16	55.04	-0.77	48.54	24.26	24.28	1.999		
5,600.00	5,599.85	5,599.85	5,599.85	10.03	14.70	-120.11	55.04	-0.77	48.66	23.93	24.73	1.968		
5,700.00	5,699.84	5,699.84	5,699.84	10.19	14.96	-174.32	55.04	-0.77	48.92	23.76	25.15	1.945		
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	174.15	55.04	-0.77	49.36	23.76	25.60	1.928		
5,900.00	5,899.84	5,899.84	5,899.84	10.56	15.49	175.72	55.04	-0.77	49.81	23.75	26.06	1.912	ES, SF	
6,000.00	5,999.83	5,999.83	5,999.83	10.76	15.76	170.80	55.04	-0.77	51.44	24.93	26.52	1.940		
6,100.00	6,099.75	6,099.75	6,099.75	10.96	16.02	169.73	55.04	-0.77	55.22	28.24	26.98	2.047		
6,200.00	6,199.65	6,199.65	6,199.65	11.16	16.29	167.81	55.04	-0.77	59.62	32.17	27.45	2.172		
6,300.00	6,299.55	6,299.55	6,299.55	11.37	16.55	169.51	55.04	-0.77	64.02	36.09	27.92	2.293		
6,400.00	6,399.46	6,399.46	6,399.46	11.58	16.82	169.00	55.04	-0.77	68.26	39.86	28.40	2.404		
6,500.00	6,499.38	6,499.38	6,499.38	11.79	17.09	170.46	55.04	-0.77	72.14	43.26	28.88	2.498		
6,600.00	6,599.32	6,599.32	6,599.32	12.01	17.35	172.67	55.04	-0.77	75.56	46.20	29.35	2.574		
6,700.00	6,699.26	6,699.26	6,699.26	12.22	17.62	175.05	55.04	-0.77	78.96	49.13	29.83	2.647		
6,800.00	6,799.17	6,799.17	6,799.17	12.44	17.88	171.00	55.04	-0.77	83.14	52.82	30.31	2.742		
6,900.00	6,899.07	6,899.07	6,899.07	12.66	18.15	170.91	55.04	-0.77	87.58	56.78	30.80	2.843		
7,000.00	6,998.97	6,998.97	6,998.97	12.88	18.41	169.37	55.04	-0.77	92.02	60.73	31.29	2.941		
7,100.00	7,098.86	7,098.86	7,098.86	13.11	18.68	165.68	55.04	-0.77	96.48	64.70	31.78	3.036		
7,200.00	7,198.77	7,198.77	7,198.77	13.34	18.94	169.24	55.04	-0.77	100.68	68.41	32.27	3.120		
7,300.00	7,298.67	7,298.67	7,298.67	13.56	19.21	-178.25	55.04	-0.77	105.09	72.33	32.76	3.208		
7,400.00	7,398.55	7,398.55	7,398.55	13.78	19.47	-178.05	55.04	-0.77	109.97	76.72	33.25	3.308		
7,500.00	7,498.44	7,498.44	7,498.44	14.01	19.74	168.80	55.04	-0.77	114.62	80.88	33.74	3.397		
7,600.00	7,598.30	7,598.30	7,598.30	14.25	20.00	170.98	55.04	-0.77	119.92	85.69	34.24	3.503		
7,700.00	7,698.13	7,698.13	7,698.13	14.48	20.27	167.94	55.04	-0.77	125.60	90.86	34.74	3.616		
7,800.00	7,797.98	7,797.98	7,797.98	14.72	20.53	168.94	55.04	-0.77	131.00	95.77	35.24	3.718		
7,900.00	7,897.86	7,897.86	7,897.86	14.96	20.80	170.72	55.04	-0.77	135.85	100.12	35.74	3.801		
8,000.00	7,997.77	7,997.77	7,997.77	15.19	21.06	172.49	55.04	-0.77	139.86	103.62	36.24	3.859		
8,100.00	8,097.70	8,097.70	8,097.70	15.43	21.33	170.30	55.04	-0.77	143.54	106.80	36.74	3.907		
8,200.00	8,197.64	8,197.64	8,197.64	15.67	21.59	174.18	55.04	-0.77	147.14	109.90	37.24	3.951		
8,300.00	8,297.56	8,297.56	8,297.56	15.91	21.86	-178.40	55.04	-0.77	150.97	113.22	37.75	3.999		
8,400.00	8,397.45	8,397.45	8,397.45	16.15	22.12	-175.71	55.04	-0.77	155.78	117.53	38.25	4.073		
8,500.00	8,497.32	8,497.32	8,497.32	16.38	22.39	-174.54	55.04	-0.77	160.83	122.09	38.74	4.151		
8,600.00	8,597.19	8,597.19	8,597.19	16.62	22.65	-173.00	55.04	-0.77	165.93	126.69	39.24	4.228		
8,700.00	8,697.07	8,697.07	8,697.07	16.85	22.92	-170.56	55.04	-0.77	170.83	131.09	39.74	4.298		
8,800.00	8,796.96	8,796.96	8,796.96	17.09	23.18	-173.01	55.04	-0.77	175.46	135.22	40.24	4.360		
8,900.00	8,896.87	8,896.87	8,896.87	17.33	23.45	173.76	55.04	-0.77	179.63	138.88	40.74	4.409		
9,000.00	8,996.80	8,996.80	8,996.80	17.57	23.71	178.64	55.04	-0.77	183.14	141.89	41.25	4.440		
9,100.00	9,096.75	9,096.75	9,096.75	17.82	23.98	160.04	55.04	-0.77	186.40	144.64	41.76	4.464		
9,200.00	9,196.70	9,196.70	9,196.70	18.06	24.25	131.22	55.04	-0.77	188.96	146.69	42.27	4.471		
9,300.00	9,296.64	9,296.64	9,296.64	18.30	24.51	140.42	55.04	-0.77	191.40	148.63	42.77	4.475		
9,400.00	9,396.58	9,396.58	9,396.58	18.54	24.78	159.92	55.04	-0.77	194.56	151.27	43.28	4.495		
9,500.00	9,496.53	9,496.53	9,496.53	18.79	25.04	165.75	55.04	-0.77	197.33	153.54	43.79	4.506		
9,600.00	9,596.47	9,596.47	9,596.47	19.03	25.31	-169.52	55.04	-0.77	200.93	156.63	44.30	4.535		
9,700.00	9,696.39	9,696.39	9,696.39	19.27	25.57	-169.57	55.04	-0.77	204.63	159.82	44.80	4.567		
9,800.00	9,796.32	9,796.32	9,796.32	19.51	25.84	-170.17	55.04	-0.77	208.41	163.10	45.31	4.600		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 203H - OH - Plan 1 09-05-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10044-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		
9,900.00	9,896.23	9,896.23	9,896.23	19.75	26.10	-172.23	55.04	-0.77	212.60	166.79	45.81	4.641		
10,000.00	9,996.15	9,996.15	9,996.15	20.00	26.37	-175.30	55.04	-0.77	216.63	170.31	46.32	4.677		
10,100.00	10,096.08	10,079.63	10,079.60	20.25	26.50	170.69	56.25	-0.21	222.28	175.71	46.57	4.774		
10,200.00	10,196.03	10,150.00	10,149.13	20.49	26.51	142.16	65.67	4.16	239.45	193.33	46.12	5.192		
10,300.00	10,296.00	10,208.75	10,205.50	20.71	26.52	104.69	80.57	11.08	268.31	223.54	44.77	5.993		
10,400.00	10,395.97	10,266.13	10,258.20	20.89	26.54	72.11	101.07	20.60	307.62	264.53	43.09	7.138		
10,500.00	10,495.95	10,317.64	10,302.90	21.01	26.55	49.99	124.24	31.35	356.39	315.21	41.18	8.654		
10,600.00	10,595.94	10,363.00	10,339.79	21.08	26.57	65.85	148.16	42.45	413.73	372.10	41.64	9.937		
10,700.00	10,695.63	10,400.00	10,367.92	21.11	26.59	25.48	169.95	52.57	475.06	433.18	41.87	11.345		
10,800.00	10,791.50	10,450.00	10,402.93	21.12	26.63	16.04	202.53	67.08	525.92	484.80	41.12	12.791		
10,900.00	10,880.02	10,500.00	10,434.58	21.16	26.69	17.26	238.85	80.38	566.75	526.42	40.33	14.053		
11,000.00	10,958.70	10,540.92	10,457.77	21.24	26.76	17.52	271.11	90.10	599.75	560.32	39.43	15.210		
11,100.00	11,026.51	10,588.02	10,481.20	21.37	26.84	17.32	310.75	99.91	625.88	587.09	38.79	16.136		
11,200.00	11,083.86	10,635.22	10,500.96	21.58	26.94	17.56	352.80	108.15	647.45	609.15	38.31	16.901		
11,300.00	11,126.68	10,682.80	10,516.92	21.87	27.05	17.65	397.11	114.77	661.21	623.19	38.03	17.388		
11,400.00	11,154.67	10,725.00	10,527.62	22.26	27.16	17.29	437.68	119.17	667.27	629.37	37.90	17.606		
11,500.00	11,166.33	10,775.00	10,535.98	22.74	27.31	17.38	486.84	122.55	664.03	626.01	38.03	17.463		
11,600.00	11,169.52	10,825.00	10,539.55	23.29	27.48	17.35	536.67	123.91	660.23	621.90	38.34	17.222		
11,700.00	11,169.60	10,829.30	10,539.64	23.31	27.49	17.34	540.96	123.93	660.22	621.87	38.34	17.218		
11,800.00	11,170.81	10,913.23	10,539.06	23.93	27.81	17.05	624.89	123.40	660.81	622.08	38.72	17.064		
11,900.00	11,170.08	11,013.20	10,538.19	24.63	28.25	16.85	724.85	122.70	660.26	621.07	39.19	16.848		
12,000.00	11,168.76	11,113.19	10,537.32	25.39	28.75	16.82	824.84	122.00	659.70	619.94	39.76	16.593		
12,100.00	11,167.38	11,213.19	10,536.45	26.22	29.32	16.87	924.83	121.30	659.34	618.94	40.41	16.317		
12,200.00	11,166.10	11,313.19	10,535.58	27.09	29.95	16.90	1,024.83	120.60	659.01	617.89	41.12	16.028		
12,300.00	11,164.16	11,413.18	10,534.71	28.02	30.64	16.90	1,124.81	119.90	657.88	616.00	41.88	15.708		
12,400.00	11,163.17	11,477.50	10,534.15	28.64	31.10	16.96	1,189.12	119.45	657.70	615.28	42.43	15.502		
12,500.00	11,163.16	11,513.16	10,533.84	28.98	31.37	17.05	1,224.78	119.20	658.36	615.61	42.75	15.401		
12,600.00	11,160.99	11,613.11	10,532.97	29.99	32.15	17.31	1,324.73	118.50	657.91	614.21	43.69	15.058		
12,700.00	11,158.27	11,713.06	10,532.10	31.03	32.98	17.58	1,424.67	117.80	656.94	612.24	44.70	14.698		
12,800.00	11,155.45	11,813.01	10,531.23	32.11	33.85	17.84	1,524.62	117.10	655.84	610.09	45.75	14.335		
12,900.00	11,152.55	11,912.98	10,530.36	33.21	34.76	18.05	1,624.57	116.40	654.45	607.61	46.84	13.972		
13,000.00	11,149.73	12,012.95	10,529.49	34.34	35.70	18.20	1,724.54	115.70	652.94	604.98	47.96	13.614		
13,100.00	11,147.73	12,112.94	10,528.62	35.49	36.68	18.26	1,824.53	115.00	651.96	602.87	49.09	13.281		
13,200.00	11,146.16	12,212.94	10,527.75	36.66	37.68	18.25	1,924.52	114.30	651.14	600.91	50.23	12.963		
13,300.00	11,143.37	12,312.90	10,526.88	37.84	38.72	18.16	2,024.48	113.60	648.79	597.42	51.38	12.628		
13,400.00	11,141.36	12,412.89	10,526.01	39.04	39.78	18.10	2,124.46	112.90	647.43	594.86	52.57	12.316		
13,500.00	11,140.35	12,512.89	10,525.14	40.27	40.86	18.13	2,224.45	112.20	647.38	593.56	53.82	12.028		
13,600.00	11,140.13	12,536.79	10,524.94	40.56	41.13	18.14	2,248.35	112.03	647.38	593.25	54.13	11.961		
13,700.00	11,139.55	12,612.89	10,524.27	41.50	41.97	18.12	2,324.44	111.50	647.41	592.32	55.08	11.753		
13,800.00	11,139.16	12,712.88	10,523.40	42.75	43.09	18.04	2,424.43	110.80	647.61	591.27	56.34	11.494		
13,900.00	11,138.10	12,812.88	10,522.53	44.01	44.24	18.03	2,524.42	110.10	647.37	589.72	57.65	11.229		
14,000.00	11,136.36	12,912.88	10,521.66	45.28	45.40	18.05	2,624.41	109.40	646.53	587.54	59.00	10.959		
14,100.00	11,134.44	13,012.86	10,520.80	46.56	46.58	17.99	2,724.39	108.70	645.18	584.86	60.32	10.696		
14,200.00	11,131.99	13,112.85	10,519.93	47.85	47.77	18.03	2,824.37	108.00	643.71	581.99	61.72	10.430		
14,300.00	11,129.35	13,212.83	10,519.06	49.15	48.97	18.09	2,924.35	107.29	642.04	578.91	63.14	10.169		
14,400.00	11,127.30	13,312.82	10,518.19	50.46	50.19	18.06	3,024.34	106.59	640.70	576.17	64.53	9.928		
14,500.00	11,125.53	13,412.82	10,517.32	51.78	51.42	18.14	3,124.32	105.89	640.07	574.06	66.00	9.697		
14,600.00	11,123.66	13,512.81	10,516.45	53.10	52.66	18.15	3,224.31	105.19	638.99	571.55	67.44	9.475		
14,700.00	11,121.94	13,612.79	10,515.58	54.42	53.91	18.04	3,324.29	104.49	637.69	568.86	68.83	9.265		
14,800.00	11,120.47	13,712.77	10,514.71	55.75	55.17	17.88	3,424.26	103.79	636.51	566.31	70.20	9.067		
14,900.00	11,118.28	13,812.76	10,513.84	57.09	56.44	17.84	3,524.24	103.09	634.95	563.31	71.65	8.862		
15,000.00	11,115.63	13,912.74	10,512.97	58.43	57.72	17.81	3,624.21	102.39	633.01	559.89	73.12	8.657		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 203H - OH - Plan 1 09-05-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10044-MWD+HDGM														
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				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)	Minimum Separation (usft)	Separation Factor		
14,800.00	11,113.90	14,012.73	10,512.10	59.78	59.00	17.77	3,724.20	101.69	631.97	557.39	74.59	8.473		
14,900.00	11,112.44	14,112.73	10,511.23	61.13	60.30	17.80	3,824.19	100.99	631.48	555.36	76.12	8.296		
15,000.00	11,107.78	14,212.62	10,510.36	62.49	61.59	18.09	3,924.08	100.29	628.52	550.69	77.83	8.076		
15,100.00	11,100.29	14,312.36	10,509.49	63.86	62.90	18.55	4,023.81	99.59	623.15	543.48	79.67	7.822		
15,200.00	11,093.78	14,412.17	10,508.63	65.23	64.21	18.89	4,123.61	98.89	618.49	537.01	81.48	7.591		
15,300.00	11,090.64	14,512.14	10,507.76	66.60	65.52	19.05	4,223.57	98.19	616.68	533.53	83.16	7.416		
15,400.00	11,088.46	14,612.13	10,506.89	67.97	66.85	19.11	4,323.56	97.49	615.49	530.72	84.77	7.261		
15,500.00	11,085.18	14,712.09	10,506.02	69.34	68.17	19.08	4,423.51	96.79	612.80	526.48	86.32	7.100		
15,600.00	11,082.81	14,812.08	10,505.15	70.72	69.50	19.09	4,523.49	96.09	611.32	523.39	87.92	6.953		
15,700.00	11,080.37	14,912.06	10,504.28	72.10	70.84	19.17	4,623.47	95.39	609.94	520.36	89.58	6.809		
15,800.00	11,077.84	15,012.05	10,503.41	73.48	72.18	19.17	4,723.45	94.69	608.15	516.98	91.17	6.671		
15,859.00	11,076.45	15,071.04	10,502.90	74.30	72.97	19.14	4,782.44	94.28	607.11	515.02	92.09	6.593		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 303H - OH / Job #61822 - Surveys (H&P 482)													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	-1.00	0.00	0.00	-90.43		-7.70	-1,019.60	1,019.63				
100.00	100.00	98.35	97.35	0.14	0.06	84.47		-7.64	-1,019.73	1,019.77	1,019.57	0.20	5,071.171	
200.00	200.00	200.25	199.25	0.40	0.24	75.66		-7.27	-1,019.90	1,019.87	1,019.23	0.64	1,600.298	
300.00	300.00	301.12	300.12	0.66	0.42	83.11		-6.60	-1,019.94	1,019.85	1,018.77	1.08	947.313	
400.00	400.00	402.94	401.94	0.91	0.60	53.64		-5.89	-1,019.84	1,019.68	1,018.17	1.51	675.946	
500.00	500.00	505.56	504.56	1.16	0.78	64.31		-5.59	-1,019.49	1,019.15	1,017.21	1.93	527.426	
579.90	579.89	580.13	579.12	1.36	0.91	75.30		-5.40	-1,019.35	1,018.91	1,016.64	2.27	449.245	
600.00	600.00	600.00	598.99	1.42	0.94	78.69		-5.28	-1,019.38	1,018.93	1,016.58	2.35	432.765	
700.00	700.00	700.00	698.99	1.68	1.12	74.49		-4.59	-1,019.41	1,018.89	1,016.10	2.79	364.677	
744.81	744.81	744.90	743.89	1.80	1.20	75.27		-4.34	-1,019.39	1,018.83	1,015.84	2.99	340.620	
800.00	800.00	796.99	795.98	1.95	1.29	76.46		-4.20	-1,019.51	1,018.90	1,015.67	3.23	315.615	
900.00	900.00	894.25	893.23	2.21	1.46	62.87		-4.09	-1,020.03	1,019.34	1,015.68	3.66	278.368	
1,000.00	1,000.00	994.58	993.57	2.47	1.64	64.88		-3.93	-1,020.69	1,019.86	1,015.76	4.10	248.702	
1,100.00	1,100.00	1,105.74	1,104.72	2.73	1.83	42.62		-3.30	-1,020.78	1,019.84	1,015.29	4.55	224.137	
1,200.00	1,200.00	1,204.70	1,203.68	2.98	2.01	55.73		-2.78	-1,020.37	1,019.32	1,014.35	4.98	204.861	
1,300.00	1,299.99	1,302.08	1,301.06	3.24	2.18	54.80		-2.52	-1,020.14	1,018.97	1,013.57	5.41	188.462	
1,400.00	1,399.99	1,400.00	1,398.98	3.50	2.35	51.84		-2.51	-1,020.13	1,018.79	1,012.96	5.84	174.491	
1,471.20	1,471.20	1,470.09	1,469.07	3.69	2.47	52.24		-2.67	-1,020.23	1,018.75	1,012.60	6.15	165.732	
1,500.00	1,499.99	1,498.38	1,497.36	3.77	2.52	52.40		-2.68	-1,020.30	1,018.76	1,012.49	6.27	162.441	
1,600.00	1,599.99	1,599.21	1,598.19	4.02	2.69	46.95		-2.85	-1,020.52	1,018.76	1,012.05	6.71	151.880	
1,700.00	1,699.99	1,707.94	1,706.91	4.24	2.88	2.41		-2.92	-1,020.21	1,018.29	1,011.18	7.12	143.117	
1,800.00	1,799.99	1,806.86	1,805.84	4.32	3.05	-102.86		-2.85	-1,019.61	1,017.70	1,010.34	7.36	138.246	
1,900.00	1,899.99	1,910.83	1,909.80	4.31	3.23	-112.73		-3.14	-1,018.76	1,017.05	1,009.51	7.54	134.952	
2,000.00	1,999.99	2,005.91	2,004.88	4.32	3.40	-111.15		-3.57	-1,018.11	1,016.57	1,008.86	7.71	131.844	
2,100.00	2,099.99	2,113.81	2,112.77	4.34	3.58	-109.94		-4.27	-1,017.11	1,015.84	1,007.91	7.92	128.216	
2,200.00	2,199.99	2,213.10	2,212.05	4.38	3.76	-121.63		-4.88	-1,015.91	1,014.87	1,006.73	8.14	124.725	
2,300.00	2,299.99	2,314.58	2,313.52	4.45	3.93	-159.53		-5.22	-1,014.61	1,013.87	1,005.48	8.38	120.920	
2,400.00	2,399.98	2,413.93	2,412.87	4.57	4.11	164.36		-5.35	-1,013.30	1,012.85	1,004.17	8.68	116.722	
2,500.00	2,499.98	2,512.09	2,511.01	4.71	4.28	-169.75		-5.56	-1,012.17	1,012.11	1,003.12	8.98	112.655	
2,600.00	2,599.98	2,614.15	2,613.07	4.83	4.46	-168.58		-5.71	-1,010.93	1,011.48	1,002.19	9.29	108.893	
2,700.00	2,699.98	2,713.60	2,712.51	4.96	4.63	-161.64		-5.82	-1,009.69	1,011.04	1,001.45	9.59	105.377	
2,800.00	2,799.97	2,815.22	2,814.12	5.11	4.81	-171.80		-5.79	-1,008.33	1,010.87	1,000.96	9.92	101.946	
2,872.80	2,872.77	2,887.62	2,886.51	5.22	4.94	-166.93		-5.84	-1,007.33	1,010.87	1,000.71	10.16	99.538	
2,900.00	2,899.96	2,913.49	2,912.39	5.26	4.99	-165.12		-5.90	-1,006.99	1,010.86	1,000.61	10.24	98.685	
3,000.00	2,999.95	3,005.41	3,004.30	5.43	5.15	-176.14		-6.14	-1,006.24	1,011.70	1,001.12	10.57	95.696	
3,100.00	3,099.94	3,104.22	3,103.10	5.62	5.32	123.99		-6.18	-1,005.87	1,012.40	1,001.46	10.94	92.528	
3,200.00	3,199.94	3,200.00	3,198.89	5.80	5.49	-13.71		-6.33	-1,005.89	1,012.18	1,000.90	11.28	89.703	
3,300.00	3,299.94	3,302.86	3,301.74	5.92	5.67	-71.19		-7.00	-1,005.97	1,011.83	1,000.24	11.59	87.310	
3,397.96	3,397.90	3,399.14	3,398.02	6.04	5.83	-90.94		-8.01	-1,005.87	1,011.62	999.75	11.87	85.219	
3,400.00	3,399.93	3,401.14	3,400.02	6.04	5.84	-91.40		-8.04	-1,005.87	1,011.66	999.78	11.88	85.180	
3,500.00	3,499.93	3,500.00	3,498.87	6.17	6.01	-97.39		-9.36	-1,005.95	1,011.80	999.62	12.17	83.106	
3,600.00	3,599.93	3,591.79	3,590.66	6.30	6.17	-67.90		-10.45	-1,006.45	1,012.40	999.93	12.47	81.186	
3,700.00	3,699.93	3,687.69	3,686.54	6.45	6.33	-18.33		-11.14	-1,007.53	1,013.05	1,000.27	12.79	79.233	
3,800.00	3,799.92	3,792.32	3,791.17	6.62	6.52	-4.45		-11.95	-1,008.72	1,013.55	1,000.42	13.13	77.177	
3,900.00	3,899.92	3,893.58	3,892.41	6.79	6.69	2.20		-13.36	-1,009.49	1,013.46	999.98	13.48	75.156	
3,954.50	3,954.42	3,946.18	3,945.01	6.89	6.78	-6.38		-14.13	-1,009.91	1,013.39	999.72	13.67	74.113	
4,000.00	3,999.92	3,989.84	3,988.66	6.97	6.86	-13.94		-14.67	-1,010.35	1,013.40	999.57	13.83	73.271	
4,100.00	4,099.91	4,084.59	4,083.39	7.15	7.02	-17.87		-15.15	-1,011.63	1,013.85	999.67	14.17	71.531	
4,200.00	4,199.90	4,183.99	4,182.78	7.34	7.20	-8.49		-14.78	-1,013.33	1,014.42	999.89	14.53	69.807	
4,300.00	4,299.90	4,285.26	4,284.03	7.53	7.37	106.55		-14.25	-1,014.99	1,015.50	1,000.60	14.90	68.169	
4,400.00	4,399.90	4,386.51	4,385.27	7.71	7.55	-26.82		-13.27	-1,016.52	1,016.74	1,001.48	15.26	66.638	
4,500.00	4,499.89	4,492.22	4,490.96	7.89	7.73	-35.12		-12.22	-1,017.79	1,016.97	1,001.34	15.63	65.085	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 303H - OH / Job #61822 - Surveys (H&P 482)														Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD														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)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
4,600.00	4,599.89	4,595.20	4,593.94	8.08	7.91	-31.43	-11.31	-1,018.55	1,016.83	1,000.84	15.99	63.587			
4,700.00	4,699.88	4,705.97	4,704.71	8.27	8.10	-39.41	-10.43	-1,018.61	1,016.07	999.70	16.37	62.065			
4,800.00	4,799.88	4,806.38	4,805.10	8.45	8.28	65.77	-9.21	-1,018.13	1,015.23	998.50	16.73	60.669			
4,900.00	4,899.87	4,906.82	4,905.53	8.65	8.46	-35.81	-7.58	-1,017.61	1,014.02	996.92	17.10	59.298			
5,000.00	4,999.87	5,008.51	5,007.21	8.84	8.63	-39.17	-6.02	-1,016.97	1,012.53	995.05	17.47	57.954			
5,100.00	5,099.86	5,107.71	5,106.39	9.03	8.81	-39.42	-4.45	-1,016.30	1,011.09	993.25	17.84	56.674			
5,200.00	5,199.86	5,206.96	5,205.63	9.23	8.98	-52.75	-2.80	-1,015.72	1,009.72	991.51	18.21	55.452			
5,300.00	5,299.85	5,307.56	5,306.21	9.42	9.16	-44.72	-1.22	-1,015.13	1,008.50	989.92	18.58	54.279			
5,400.00	5,399.85	5,408.90	5,407.55	9.63	9.33	-24.33	0.17	-1,014.41	1,006.95	987.98	18.96	53.098			
5,500.00	5,499.85	5,506.38	5,505.01	9.85	9.51	2.32	1.26	-1,013.79	1,005.86	986.51	19.35	51.982			
5,590.28	5,590.12	5,593.16	5,591.79	10.01	9.66	136.78	2.12	-1,013.50	1,005.51	985.84	19.67	51.121			
5,600.00	5,599.85	5,602.49	5,601.12	10.03	9.67	141.04	2.21	-1,013.49	1,005.47	985.76	19.70	51.030			
5,700.00	5,699.84	5,700.00	5,698.62	10.19	9.84	87.22	3.31	-1,013.61	1,005.81	985.77	20.03	50.206			
5,800.00	5,799.84	5,805.57	5,804.18	10.37	10.03	75.76	4.92	-1,013.56	1,005.66	985.26	20.40	49.298			
5,900.00	5,899.84	5,908.85	5,907.45	10.56	10.21	77.38	6.24	-1,012.91	1,004.92	984.15	20.77	48.384			
6,000.00	5,999.83	6,003.86	6,002.45	10.76	10.38	72.35	7.36	-1,012.46	1,003.96	982.83	21.13	47.513			
6,100.00	6,099.75	6,118.55	6,117.14	10.96	10.58	70.88	7.97	-1,011.22	1,001.65	980.13	21.53	46.529			
6,200.00	6,199.65	6,222.53	6,221.09	11.16	10.76	68.31	7.73	-1,009.19	998.12	976.21	21.91	45.552			
6,300.00	6,299.55	6,320.09	6,318.62	11.37	10.93	69.39	6.64	-1,007.01	994.28	971.99	22.29	44.605			
6,400.00	6,399.46	6,400.00	6,398.51	11.58	11.07	68.26	5.32	-1,006.26	991.74	969.10	22.64	43.796			
6,500.00	6,499.38	6,490.10	6,488.60	11.79	11.23	69.25	3.54	-1,006.77	990.86	967.85	23.01	43.057			
6,600.00	6,599.32	6,591.96	6,590.42	12.01	11.40	71.07	1.06	-1,007.90	990.70	967.30	23.40	42.330			
6,629.55	6,628.85	6,619.68	6,618.13	12.07	11.45	71.77	0.31	-1,008.18	990.67	967.15	23.52	42.129			
6,700.00	6,699.26	6,683.32	6,681.74	12.22	11.56	73.27	-1.27	-1,009.12	991.02	967.25	23.78	41.683			
6,800.00	6,799.17	6,787.75	6,786.12	12.44	11.74	68.97	-3.72	-1,010.92	991.34	967.17	24.18	41.006			
6,900.00	6,899.07	6,902.68	6,901.01	12.66	11.94	68.46	-6.51	-1,011.66	990.23	965.63	24.60	40.257			
7,000.00	6,998.97	6,990.88	6,989.19	12.88	12.10	66.58	-8.63	-1,012.10	989.02	964.05	24.97	39.602			
7,100.00	7,098.86	7,095.24	7,093.52	13.11	12.28	62.40	-11.04	-1,013.04	987.88	962.49	25.38	38.919			
7,200.00	7,198.77	7,197.35	7,195.60	13.34	12.46	65.46	-13.31	-1,013.54	986.33	960.54	25.79	38.245			
7,272.70	7,271.40	7,261.01	7,259.24	13.50	12.57	74.86	-14.63	-1,014.06	985.80	959.74	26.06	37.823			
7,300.00	7,298.67	7,284.76	7,282.99	13.56	12.61	77.84	-15.04	-1,014.41	985.85	959.69	26.17	37.677			
7,400.00	7,398.55	7,377.26	7,375.47	13.78	12.77	78.39	-16.01	-1,016.31	986.95	960.41	26.55	37.177			
7,500.00	7,498.44	7,488.02	7,486.20	14.01	12.96	65.40	-15.36	-1,018.47	987.52	960.55	26.97	36.613			
7,600.00	7,598.30	7,594.83	7,592.99	14.25	13.15	67.53	-13.13	-1,019.28	986.16	958.77	27.39	36.001			
7,700.00	7,698.13	7,694.11	7,692.23	14.48	13.32	64.44	-10.84	-1,019.71	984.36	956.56	27.80	35.408			
7,800.00	7,797.98	7,792.59	7,790.69	14.72	13.49	65.33	-8.96	-1,020.26	982.69	954.48	28.21	34.836			
7,900.00	7,897.86	7,889.67	7,887.76	14.96	13.66	67.09	-7.11	-1,020.99	981.57	952.95	28.62	34.302			
8,000.00	7,997.77	7,987.64	7,985.70	15.19	13.83	68.95	-5.14	-1,021.96	981.22	952.20	29.02	33.808			
8,100.00	8,097.70	8,087.80	8,085.84	15.43	14.01	66.82	-3.38	-1,023.07	981.02	951.58	29.44	33.326			
8,200.00	8,197.64	8,195.31	8,193.33	15.67	14.20	70.78	-1.80	-1,023.87	980.53	950.66	29.86	32.833			
8,300.00	8,297.56	8,298.62	8,296.63	15.91	14.38	78.45	-0.33	-1,024.01	979.78	949.49	30.28	32.355			
8,400.00	8,397.45	8,393.29	8,391.29	16.15	14.54	81.61	1.29	-1,024.19	979.36	948.68	30.68	31.918			
8,500.00	8,497.32	8,494.79	8,492.77	16.38	14.72	83.30	2.91	-1,024.61	979.23	948.14	31.10	31.490			
8,600.00	8,597.19	8,611.12	8,609.10	16.62	14.92	85.46	4.07	-1,023.94	978.27	946.74	31.53	31.025			
8,700.00	8,697.07	8,703.92	8,701.89	16.85	15.09	88.44	4.72	-1,023.09	977.14	945.21	31.93	30.602			
8,800.00	8,796.96	8,805.80	8,803.77	17.09	15.27	86.53	4.75	-1,022.48	976.43	944.08	32.34	30.189			
8,900.00	8,896.87	8,909.80	8,907.76	17.33	15.45	73.60	4.53	-1,021.54	974.88	942.12	32.76	29.755			
9,000.00	8,996.80	9,009.46	9,007.42	17.57	15.62	78.54	4.23	-1,020.45	972.76	939.58	33.18	29.316			
9,100.00	9,096.75	9,105.99	9,103.94	17.82	15.79	59.98	3.88	-1,019.63	970.84	937.24	33.60	28.897			
9,200.00	9,196.70	9,212.16	9,210.10	18.06	15.97	30.73	3.00	-1,018.59	967.62	933.60	34.02	28.442			
9,300.00	9,296.64	9,313.68	9,311.61	18.30	16.15	39.30	2.22	-1,017.11	963.27	928.83	34.44	27.973			
9,400.00	9,396.58	9,405.23	9,403.15	18.54	16.31	58.37	1.10	-1,016.26	959.83	924.98	34.85	27.545			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD													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		
9,500.00	9,496.53	9,506.78	9,504.67	18.79	16.49	63.91	-1.06	-1,015.74	957.46	922.19	35.27	27.146		
9,600.00	9,596.47	9,600.00	9,597.87	19.03	16.65	88.76	-3.02	-1,015.46	956.35	920.67	35.68	26.804		
9,643.97	9,640.40	9,641.80	9,639.67	19.14	16.72	88.88	-3.68	-1,015.50	956.26	920.40	35.86	26.669		
9,700.00	9,696.39	9,693.14	9,691.00	19.27	16.81	89.04	-4.21	-1,015.74	956.40	920.32	36.08	26.507		
9,800.00	9,796.32	9,795.15	9,793.01	19.51	16.99	88.86	-4.35	-1,016.27	956.84	920.35	36.50	26.216		
9,900.00	9,896.23	9,891.72	9,889.58	19.75	17.16	87.22	-4.29	-1,016.75	957.20	920.29	36.91	25.934		
10,000.00	9,996.15	9,993.62	9,991.47	20.00	17.34	84.49	-4.86	-1,017.47	957.55	920.22	37.33	25.651		
10,100.00	10,096.08	10,090.16	10,088.00	20.25	17.50	70.67	-5.25	-1,018.17	957.56	919.81	37.75	25.369		
10,200.00	10,196.03	10,183.84	10,181.69	20.49	17.67	41.89	-5.57	-1,019.31	957.08	918.93	38.15	25.086		
10,300.00	10,296.00	10,281.03	10,278.85	20.71	17.84	3.87	-6.34	-1,021.09	956.51	917.97	38.54	24.818		
10,379.86	10,375.84	10,358.69	10,356.49	20.85	17.97	-22.51	-7.20	-1,022.72	956.33	917.52	38.81	24.639		
10,400.00	10,395.97	10,378.23	10,376.02	20.89	18.01	-29.53	-7.34	-1,023.15	956.29	917.40	38.88	24.594		
10,500.00	10,495.95	10,486.44	10,484.21	21.01	18.19	-52.51	-8.11	-1,025.22	956.58	917.38	39.20	24.400		
10,600.00	10,595.94	10,591.02	10,588.78	21.08	18.38	-37.19	-9.40	-1,026.41	956.42	916.97	39.45	24.241		
10,700.00	10,695.63	10,690.01	10,687.76	21.11	18.55	-76.02	-10.66	-1,027.37	954.85	915.20	39.65	24.083		
10,800.00	10,791.50	10,777.11	10,774.85	21.12	18.70	-86.77	-11.32	-1,028.55	952.41	912.60	39.81	23.923		
10,900.00	10,880.02	10,864.58	10,862.29	21.16	18.85	-86.90	-10.95	-1,030.21	952.31	912.31	40.00	23.807		
11,000.00	10,958.70	10,959.35	10,957.05	21.24	19.02	-89.52	-9.86	-1,031.39	951.02	910.77	40.25	23.630		
11,015.33	10,969.76	10,974.21	10,971.91	21.26	19.05	-90.19	-9.67	-1,031.39	950.98	910.68	40.29	23.602 CC, ES		
11,100.00	11,026.51	11,037.34	11,035.03	21.37	19.16	-93.03	-8.88	-1,030.93	953.04	912.53	40.51	23.524 SF		
11,200.00	11,083.86	11,094.03	11,091.72	21.58	19.25	-94.65	-8.35	-1,030.50	961.52	920.71	40.81	23.560		
11,300.00	11,126.68	11,138.50	11,136.18	21.87	19.33	-95.38	-7.98	-1,030.18	978.28	937.13	41.16	23.770		
11,400.00	11,154.67	11,168.60	11,166.29	22.26	19.38	-95.17	-7.64	-1,029.95	1,006.34	964.81	41.53	24.231		
11,500.00	11,166.33	11,182.13	11,179.81	22.74	19.41	-91.94	-7.47	-1,029.84	1,047.20	1,005.30	41.90	24.996		
11,600.00	11,169.52	11,186.95	11,184.63	23.29	19.42	-91.99	-7.40	-1,029.80	1,096.55	1,054.31	42.24	25.961		
11,700.00	11,170.81	11,189.83	11,187.51	23.93	19.42	-90.93	-7.36	-1,029.78	1,151.44	1,108.88	42.56	27.052		
11,800.00	11,170.08	11,190.56	11,188.24	24.63	19.42	-90.57	-7.35	-1,029.77	1,210.87	1,168.01	42.86	28.249		
11,900.00	11,168.76	11,190.66	11,188.34	25.39	19.42	-90.47	-7.35	-1,029.77	1,273.99	1,230.85	43.14	29.533		
12,000.00	11,167.38	11,190.67	11,188.35	26.22	19.42	-90.51	-7.35	-1,029.77	1,340.93	1,297.55	43.39	30.907		
12,100.00	11,166.10	11,190.81	11,188.49	27.09	19.42	-90.39	-7.35	-1,029.77	1,411.98	1,368.38	43.61	32.379		
12,200.00	11,164.16	11,190.20	11,187.88	28.02	19.42	-90.31	-7.35	-1,029.77	1,486.69	1,442.89	43.80	33.939		
12,300.00	11,163.16	11,190.63	11,188.31	28.98	19.42	-90.54	-7.35	-1,029.77	1,562.75	1,518.77	43.98	35.533		
12,400.00	11,160.99	11,189.74	11,187.42	29.99	19.42	-89.58	-7.36	-1,029.78	1,641.02	1,596.88	44.14	37.179		
12,500.00	11,158.27	11,188.20	11,185.89	31.03	19.42	-89.34	-7.38	-1,029.79	1,721.53	1,677.25	44.28	38.880		
12,600.00	11,155.45	11,186.53	11,184.21	32.11	19.42	-89.16	-7.41	-1,029.80	1,804.08	1,759.67	44.40	40.629		
12,700.00	11,152.55	11,184.74	11,182.42	33.21	19.41	-88.98	-7.43	-1,029.82	1,888.71	1,844.20	44.51	42.433		
12,800.00	11,149.73	11,183.01	11,180.69	34.34	19.41	-89.20	-7.45	-1,029.83	1,975.09	1,930.48	44.61	44.270		
12,900.00	11,147.73	11,182.23	11,179.91	35.49	19.41	-90.59	-7.46	-1,029.84	2,063.08	2,018.38	44.71	46.146		
13,000.00	11,146.16	11,181.95	11,179.64	36.66	19.41	-89.02	-7.47	-1,029.84	2,152.48	2,107.68	44.79	48.053		
13,100.00	11,143.37	11,180.22	11,177.91	37.84	19.40	-88.68	-7.49	-1,029.85	2,243.26	2,198.39	44.87	49.994		
13,200.00	11,141.36	11,179.40	11,177.08	39.04	19.40	-90.67	-7.50	-1,029.86	2,334.48	2,289.54	44.95	51.940		
13,300.00	11,140.35	11,179.76	11,177.44	40.27	19.40	-90.94	-7.50	-1,029.86	2,425.94	2,380.92	45.02	53.886		
13,400.00	11,139.55	11,180.40	11,178.09	41.50	19.41	-91.44	-7.49	-1,029.85	2,518.19	2,473.10	45.09	55.845		
13,500.00	11,139.16	11,181.58	11,179.26	42.75	19.41	-91.95	-7.47	-1,029.84	2,611.27	2,566.11	45.16	57.817		
13,600.00	11,138.10	11,181.92	11,179.60	44.01	19.41	-90.04	-7.47	-1,029.84	2,704.62	2,659.39	45.23	59.794		
13,700.00	11,136.36	11,181.41	11,179.09	45.28	19.41	-89.65	-7.48	-1,029.84	2,798.38	2,753.09	45.30	61.779		
13,800.00	11,134.44	11,180.66	11,178.34	46.56	19.41	-89.13	-7.49	-1,029.85	2,892.92	2,847.56	45.36	63.773		
13,900.00	11,131.99	11,179.20	11,176.88	47.85	19.40	-88.24	-7.50	-1,029.86	2,987.42	2,942.00	45.42	65.771		
14,000.00	11,129.35	11,177.46	11,175.14	49.15	19.40	-88.49	-7.53	-1,029.88	3,082.28	3,036.80	45.48	67.769		
14,100.00	11,127.30	11,176.46	11,174.15	50.46	19.40	-89.47	-7.54	-1,029.88	3,177.68	3,132.14	45.55	69.767		
14,200.00	11,125.53	11,175.82	11,173.50	51.78	19.40	-89.49	-7.55	-1,029.89	3,272.95	3,227.34	45.61	71.765		
14,300.00	11,123.66	11,175.04	11,172.72	53.10	19.40	-89.32	-7.56	-1,029.90	3,368.80	3,323.13	45.67	73.764		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Black & Tan 27 Federal Com - 303H - OH / Job #61822 - Surveys (H&P 482)		Offset Site Error: 0.00 usft	
Survey Program: 100-SPT_GTD													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)						
14,400.00	11,121.94	11,174.46	11,172.14	54.42	19.39	-90.06	-7.57	-1,029.90	3,465.21	3,419.48	45.73	75.770				
14,500.00	11,120.47	11,174.21	11,171.89	55.75	19.39	-89.38	-7.57	-1,029.90	3,561.92	3,516.12	45.80	77.773				
14,600.00	11,118.28	11,172.94	11,170.62	57.09	19.39	-87.55	-7.59	-1,029.91	3,658.55	3,612.69	45.86	79.776				
14,700.00	11,115.63	11,170.99	11,168.67	58.43	19.39	-87.77	-7.61	-1,029.93	3,755.31	3,709.38	45.92	81.776				
14,800.00	11,113.90	11,170.32	11,168.01	59.78	19.39	-91.59	-7.62	-1,029.93	3,852.22	3,806.23	45.99	83.767				
14,900.00	11,112.44	11,170.01	11,167.70	61.13	19.39	-87.36	-7.62	-1,029.93	3,949.05	3,903.00	46.05	85.747				
15,000.00	11,107.78	11,165.00	11,162.68	62.49	19.38	-78.96	-7.68	-1,029.97	4,045.51	3,999.40	46.11	87.731				
15,100.00	11,100.29	11,155.68	11,153.36	63.86	19.36	-76.03	-7.79	-1,030.05	4,141.81	4,095.65	46.16	89.720				
15,200.00	11,093.78	11,147.62	11,145.30	65.23	19.35	-81.50	-7.88	-1,030.11	4,238.51	4,192.29	46.22	91.705				
15,300.00	11,090.64	11,144.49	11,142.18	66.60	19.34	-88.45	-7.92	-1,030.13	4,335.72	4,289.44	46.28	93.675				
15,400.00	11,088.46	11,142.76	11,140.44	67.97	19.34	-86.17	-7.93	-1,030.14	4,433.28	4,386.93	46.35	95.640				
15,500.00	11,085.18	11,139.30	11,136.98	69.34	19.33	-84.12	-7.97	-1,030.17	4,531.21	4,484.79	46.42	97.608				
15,600.00	11,082.81	11,137.17	11,134.85	70.72	19.33	-87.53	-7.99	-1,030.19	4,629.03	4,582.54	46.49	99.569				
15,700.00	11,080.37	11,134.87	11,132.55	72.10	19.33	-85.92	-8.01	-1,030.20	4,726.84	4,680.27	46.56	101.520				
15,800.00	11,077.84	11,132.38	11,130.06	73.48	19.32	-86.24	-8.04	-1,030.22	4,824.92	4,778.29	46.63	103.466				
15,859.00	11,076.45	11,131.05	11,128.74	74.30	19.32	-86.16	-8.05	-1,030.23	4,882.88	4,836.21	46.68	104.613				

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 303H - ST01 / Job #61822 - Surveys (H&P 482)													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD, 10761-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	-1.00	0.00	0.00	-90.43	-7.70	-1,019.60	1,019.63					
100.00	100.00	98.35	97.35	0.14	0.06	84.47	-7.64	-1,019.73	1,019.77	1,019.57	0.20	5,070.440		
200.00	200.00	200.25	199.25	0.40	0.24	75.66	-7.27	-1,019.90	1,019.87	1,019.23	0.64	1,600.034		
300.00	300.00	301.12	300.12	0.66	0.42	83.11	-6.60	-1,019.94	1,019.85	1,018.77	1.08	947.194		
400.00	400.00	402.94	401.94	0.91	0.60	53.64	-5.89	-1,019.84	1,019.68	1,018.17	1.51	675.893		
500.00	500.00	505.56	504.56	1.16	0.78	64.31	-5.59	-1,019.49	1,019.15	1,017.21	1.93	527.422		
579.90	579.89	580.13	579.12	1.36	0.91	75.30	-5.40	-1,019.35	1,018.91	1,016.64	2.27	449.250		
600.00	600.00	600.00	598.99	1.42	0.94	78.69	-5.28	-1,019.38	1,018.93	1,016.58	2.35	432.771		
700.00	700.00	700.00	698.99	1.68	1.12	74.49	-4.59	-1,019.41	1,018.89	1,016.10	2.79	364.681		
744.81	744.81	744.90	743.89	1.80	1.20	75.27	-4.34	-1,019.39	1,018.83	1,015.84	2.99	340.621		
800.00	800.00	796.99	795.98	1.95	1.29	76.46	-4.20	-1,019.51	1,018.90	1,015.67	3.23	315.613		
900.00	900.00	894.25	893.23	2.21	1.46	62.87	-4.09	-1,020.03	1,019.34	1,015.68	3.66	278.358		
1,000.00	1,000.00	994.58	993.57	2.47	1.64	64.88	-3.93	-1,020.69	1,019.86	1,015.76	4.10	248.687		
1,100.00	1,100.00	1,105.74	1,104.72	2.73	1.83	42.62	-3.30	-1,020.78	1,019.84	1,015.29	4.55	224.123		
1,200.00	1,200.00	1,204.70	1,203.68	2.98	2.01	55.73	-2.78	-1,020.37	1,019.32	1,014.35	4.98	204.853		
1,300.00	1,299.99	1,302.08	1,301.06	3.24	2.18	54.80	-2.52	-1,020.14	1,018.97	1,013.57	5.41	188.458		
1,400.00	1,399.99	1,400.00	1,398.98	3.50	2.35	51.84	-2.51	-1,020.13	1,018.79	1,012.96	5.84	174.488		
1,471.20	1,471.20	1,470.09	1,469.07	3.69	2.47	52.24	-2.67	-1,020.23	1,018.75	1,012.60	6.15	165.728		
1,500.00	1,499.99	1,498.38	1,497.36	3.77	2.52	52.40	-2.68	-1,020.30	1,018.76	1,012.49	6.27	162.437		
1,600.00	1,599.99	1,599.21	1,598.19	4.02	2.69	46.95	-2.85	-1,020.52	1,018.76	1,012.05	6.71	151.876		
1,700.00	1,699.99	1,707.94	1,706.91	4.24	2.88	2.41	-2.92	-1,020.21	1,018.29	1,011.18	7.12	143.114		
1,800.00	1,799.99	1,806.86	1,805.84	4.32	3.05	-102.86	-2.85	-1,019.61	1,017.70	1,010.34	7.36	138.245		
1,900.00	1,899.99	1,910.83	1,909.80	4.31	3.23	-112.73	-3.14	-1,018.76	1,017.05	1,009.51	7.54	134.952		
2,000.00	1,999.99	2,005.91	2,004.88	4.32	3.40	-111.15	-3.57	-1,018.11	1,016.57	1,008.86	7.71	131.845		
2,100.00	2,099.99	2,113.81	2,112.77	4.34	3.58	-109.94	-4.27	-1,017.11	1,015.84	1,007.91	7.92	128.217		
2,200.00	2,199.99	2,213.10	2,212.05	4.38	3.76	-121.63	-4.88	-1,015.91	1,014.87	1,006.73	8.14	124.727		
2,300.00	2,299.99	2,314.58	2,313.52	4.45	3.93	-159.53	-5.22	-1,014.61	1,013.87	1,005.48	8.38	120.922		
2,400.00	2,399.98	2,413.93	2,412.87	4.57	4.11	164.36	-5.35	-1,013.30	1,012.85	1,004.17	8.68	116.724		
2,500.00	2,499.98	2,512.09	2,511.01	4.71	4.28	-169.75	-5.56	-1,012.17	1,012.11	1,003.12	8.98	112.657		
2,600.00	2,599.98	2,614.15	2,613.07	4.83	4.46	-168.58	-5.71	-1,010.93	1,011.48	1,002.19	9.29	108.895		
2,700.00	2,699.98	2,713.60	2,712.51	4.96	4.63	-161.64	-5.82	-1,009.69	1,011.04	1,001.45	9.59	105.379		
2,800.00	2,799.97	2,815.22	2,814.12	5.11	4.81	-171.80	-5.79	-1,008.33	1,010.87	1,000.96	9.92	101.949		
2,872.80	2,872.77	2,887.62	2,886.51	5.22	4.94	-166.93	-5.84	-1,007.33	1,010.87	1,000.71	10.16	99.541		
2,900.00	2,899.96	2,913.49	2,912.39	5.26	4.99	-165.12	-5.90	-1,006.99	1,010.86	1,000.61	10.24	98.688		
3,000.00	2,999.95	3,005.41	3,004.30	5.43	5.15	-176.14	-6.14	-1,006.24	1,011.70	1,001.12	10.57	95.698		
3,100.00	3,099.94	3,104.22	3,103.10	5.62	5.32	123.99	-6.18	-1,005.87	1,012.40	1,001.46	10.94	92.530		
3,200.00	3,199.94	3,200.00	3,198.89	5.80	5.49	-13.71	-6.33	-1,005.89	1,012.18	1,000.90	11.28	89.705		
3,300.00	3,299.94	3,302.86	3,301.74	5.92	5.67	-71.19	-7.00	-1,005.97	1,011.83	1,000.24	11.59	87.311		
3,397.96	3,397.90	3,399.14	3,398.02	6.04	5.83	-90.94	-8.01	-1,005.87	1,011.62	999.75	11.87	85.219		
3,400.00	3,399.93	3,401.14	3,400.02	6.04	5.84	-91.40	-8.04	-1,005.87	1,011.66	999.78	11.88	85.181		
3,500.00	3,499.93	3,500.00	3,498.87	6.17	6.01	-97.39	-9.36	-1,005.95	1,011.80	999.62	12.17	83.106		
3,600.00	3,599.93	3,591.79	3,590.66	6.30	6.17	-67.90	-10.45	-1,006.45	1,012.40	999.93	12.47	81.186		
3,700.00	3,699.93	3,687.69	3,686.54	6.45	6.33	-18.33	-11.14	-1,007.53	1,013.05	1,000.27	12.79	79.233		
3,800.00	3,799.92	3,792.32	3,791.17	6.62	6.52	-4.45	-11.95	-1,008.72	1,013.55	1,000.42	13.13	77.176		
3,900.00	3,899.92	3,893.58	3,892.41	6.79	6.69	2.20	-13.36	-1,009.49	1,013.46	999.98	13.48	75.156		
3,954.50	3,954.42	3,946.18	3,945.01	6.89	6.78	-6.38	-14.13	-1,009.91	1,013.39	999.72	13.67	74.112		
4,000.00	3,999.92	3,989.84	3,988.66	6.97	6.86	-13.94	-14.67	-1,010.35	1,013.40	999.57	13.83	73.271		
4,100.00	4,099.91	4,084.59	4,083.39	7.15	7.02	-17.87	-15.15	-1,011.63	1,013.85	999.67	14.17	71.530		
4,200.00	4,199.90	4,183.99	4,182.78	7.34	7.20	-8.49	-14.78	-1,013.33	1,014.42	999.89	14.53	69.806		
4,300.00	4,299.90	4,285.26	4,284.03	7.53	7.37	106.55	-14.25	-1,014.99	1,015.50	1,000.60	14.90	68.169		
4,400.00	4,399.90	4,386.51	4,385.27	7.71	7.55	-26.82	-13.27	-1,016.52	1,016.74	1,001.48	15.26	66.637		
4,500.00	4,499.89	4,492.22	4,490.96	7.89	7.73	-35.12	-12.22	-1,017.79	1,016.97	1,001.34	15.63	65.085		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 303H - ST01 / Job #61822 - Surveys (H&P 482)													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD, 10761-MWD+HDGM													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,600.00	4,599.89	4,595.20	4,593.94	8.08	7.91	-31.43	-11.31	-1,018.55	1,016.83	1,000.84	15.99	63.587		
4,700.00	4,699.88	4,705.97	4,704.71	8.27	8.10	-39.41	-10.43	-1,018.61	1,016.07	999.70	16.37	62.065		
4,800.00	4,799.88	4,806.38	4,805.10	8.45	8.28	65.77	-9.21	-1,018.13	1,015.23	998.50	16.73	60.670		
4,900.00	4,899.87	4,906.82	4,905.53	8.65	8.46	-35.81	-7.58	-1,017.61	1,014.02	996.92	17.10	59.298		
5,000.00	4,999.87	5,008.51	5,007.21	8.84	8.63	-39.17	-6.02	-1,016.97	1,012.53	995.05	17.47	57.955		
5,100.00	5,099.86	5,107.71	5,106.39	9.03	8.81	-39.42	-4.45	-1,016.30	1,011.09	993.25	17.84	56.675		
5,200.00	5,199.86	5,206.96	5,205.63	9.23	8.98	-52.75	-2.80	-1,015.72	1,009.72	991.51	18.21	55.452		
5,300.00	5,299.85	5,307.56	5,306.21	9.42	9.16	-44.72	-1.22	-1,015.13	1,008.50	989.92	18.58	54.279		
5,400.00	5,399.85	5,408.90	5,407.55	9.63	9.33	-24.33	0.17	-1,014.41	1,006.95	987.98	18.96	53.098		
5,500.00	5,499.85	5,506.38	5,505.01	9.85	9.51	2.32	1.26	-1,013.79	1,005.86	986.51	19.35	51.982		
5,590.28	5,590.12	5,593.16	5,591.79	10.01	9.66	136.78	2.12	-1,013.50	1,005.51	985.84	19.67	51.121		
5,600.00	5,599.85	5,602.49	5,601.12	10.03	9.67	141.04	2.21	-1,013.49	1,005.47	985.76	19.70	51.030		
5,700.00	5,699.84	5,700.00	5,698.62	10.19	9.84	87.22	3.31	-1,013.61	1,005.81	985.77	20.03	50.207		
5,800.00	5,799.84	5,805.57	5,804.18	10.37	10.03	75.76	4.92	-1,013.56	1,005.66	985.26	20.40	49.298		
5,900.00	5,899.84	5,908.85	5,907.45	10.56	10.21	77.38	6.24	-1,012.91	1,004.92	984.15	20.77	48.385		
6,000.00	5,999.83	6,003.86	6,002.45	10.76	10.38	72.35	7.36	-1,012.46	1,003.96	982.83	21.13	47.514		
6,100.00	6,099.75	6,118.55	6,117.14	10.96	10.58	70.88	7.97	-1,011.22	1,001.65	980.13	21.53	46.530		
6,200.00	6,199.65	6,222.53	6,221.09	11.16	10.76	68.31	7.73	-1,009.19	998.12	976.21	21.91	45.553		
6,300.00	6,299.55	6,320.09	6,318.62	11.37	10.93	69.39	6.64	-1,007.01	994.28	971.99	22.29	44.606		
6,400.00	6,399.46	6,400.00	6,398.51	11.58	11.07	68.26	5.32	-1,006.26	991.74	969.10	22.64	43.797		
6,500.00	6,499.38	6,490.10	6,488.60	11.79	11.23	69.25	3.54	-1,006.77	990.86	967.85	23.01	43.058		
6,600.00	6,599.32	6,591.96	6,590.42	12.01	11.40	71.07	1.06	-1,007.90	990.70	967.30	23.40	42.331		
6,629.55	6,628.85	6,619.68	6,618.13	12.07	11.45	71.77	0.31	-1,008.18	990.67	967.15	23.52	42.129		
6,700.00	6,699.26	6,683.32	6,681.74	12.22	11.56	73.27	-1.27	-1,009.12	991.02	967.25	23.77	41.683		
6,800.00	6,799.17	6,787.75	6,786.12	12.44	11.74	68.97	-3.72	-1,010.92	991.34	967.17	24.18	41.007		
6,900.00	6,899.07	6,902.68	6,901.01	12.66	11.94	68.46	-6.51	-1,011.66	990.23	965.63	24.60	40.257		
7,000.00	6,998.97	6,990.88	6,989.19	12.88	12.10	66.58	-8.63	-1,012.10	989.02	964.05	24.97	39.602		
7,100.00	7,098.86	7,095.24	7,093.52	13.11	12.28	62.40	-11.04	-1,013.04	987.88	962.49	25.38	38.919		
7,200.00	7,198.77	7,197.35	7,195.60	13.34	12.46	65.46	-13.31	-1,013.54	986.33	960.54	25.79	38.245		
7,272.70	7,271.40	7,261.01	7,259.24	13.50	12.57	74.86	-14.63	-1,014.06	985.80	959.74	26.06	37.823		
7,300.00	7,298.67	7,284.76	7,282.99	13.56	12.61	77.84	-15.04	-1,014.41	985.85	959.69	26.17	37.677		
7,400.00	7,398.55	7,377.26	7,375.47	13.78	12.77	78.39	-16.01	-1,016.31	986.95	960.41	26.55	37.177		
7,500.00	7,498.44	7,488.02	7,486.20	14.01	12.96	65.40	-15.36	-1,018.47	987.52	960.55	26.97	36.613		
7,600.00	7,598.30	7,594.83	7,592.99	14.25	13.15	67.53	-13.13	-1,019.28	986.16	958.77	27.39	36.001		
7,700.00	7,698.13	7,694.11	7,692.23	14.48	13.32	64.44	-10.84	-1,019.71	984.36	956.56	27.80	35.408		
7,800.00	7,797.98	7,792.59	7,790.69	14.72	13.49	65.33	-8.96	-1,020.26	982.69	954.48	28.21	34.836		
7,900.00	7,897.86	7,889.67	7,887.76	14.96	13.66	67.09	-7.11	-1,020.99	981.57	952.95	28.62	34.302		
8,000.00	7,997.77	7,987.64	7,985.70	15.19	13.83	68.95	-5.14	-1,021.96	981.22	952.20	29.02	33.808		
8,100.00	8,097.70	8,087.80	8,085.84	15.43	14.01	66.82	-3.38	-1,023.07	981.02	951.58	29.44	33.326		
8,200.00	8,197.64	8,195.31	8,193.33	15.67	14.20	70.78	-1.80	-1,023.87	980.53	950.66	29.86	32.833		
8,300.00	8,297.56	8,298.62	8,296.63	15.91	14.38	78.45	-0.33	-1,024.01	979.78	949.49	30.28	32.355		
8,400.00	8,397.45	8,393.29	8,391.29	16.15	14.54	81.61	1.29	-1,024.19	979.36	948.68	30.68	31.918		
8,500.00	8,497.32	8,494.79	8,492.77	16.38	14.72	83.30	2.91	-1,024.61	979.23	948.14	31.10	31.490		
8,600.00	8,597.19	8,611.12	8,609.10	16.62	14.92	85.46	4.07	-1,023.94	978.27	946.74	31.53	31.025		
8,700.00	8,697.07	8,703.92	8,701.89	16.85	15.09	88.44	4.72	-1,023.09	977.14	945.21	31.93	30.602		
8,800.00	8,796.96	8,805.80	8,803.77	17.09	15.27	86.53	4.75	-1,022.48	976.43	944.08	32.34	30.189		
8,900.00	8,896.87	8,909.80	8,907.76	17.33	15.45	73.60	4.53	-1,021.54	974.88	942.12	32.76	29.755		
9,000.00	8,996.80	9,009.46	9,007.42	17.57	15.62	78.54	4.23	-1,020.45	972.76	939.58	33.18	29.316		
9,100.00	9,096.75	9,105.99	9,103.94	17.82	15.79	59.98	3.88	-1,019.63	970.84	937.24	33.60	28.897		
9,200.00	9,196.70	9,212.16	9,210.10	18.06	15.97	30.73	3.00	-1,018.59	967.62	933.60	34.02	28.442		
9,300.00	9,296.64	9,313.68	9,311.61	18.30	16.15	39.30	2.22	-1,017.11	963.27	928.83	34.44	27.973		
9,400.00	9,396.58	9,405.23	9,403.15	18.54	16.31	58.37	1.10	-1,016.26	959.83	924.98	34.85	27.545		

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design													Black & Tan 27 Federal Com - 303H - ST01 / Job #61822 - Surveys (H&P 482)		Offset Site Error: 0.00 usft	
Survey Program: 100-SPT_GTD, 10761-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)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
9,500.00	9,496.53	9,506.78	9,504.67	18.79	16.49	63.91	-1.06	-1,015.74	957.46	922.19	35.27	27.146				
9,600.00	9,596.47	9,600.00	9,597.87	19.03	16.65	88.76	-3.02	-1,015.46	956.35	920.67	35.68	26.804				
9,643.97	9,640.40	9,641.80	9,639.67	19.14	16.72	88.88	-3.68	-1,015.50	956.26	920.40	35.86	26.669				
9,700.00	9,696.39	9,693.14	9,691.00	19.27	16.81	89.04	-4.21	-1,015.74	956.40	920.32	36.08	26.507				
9,800.00	9,796.32	9,795.15	9,793.01	19.51	16.99	88.86	-4.35	-1,016.27	956.84	920.35	36.50	26.216				
9,900.00	9,896.23	9,891.72	9,889.58	19.75	17.16	87.22	-4.29	-1,016.75	957.20	920.29	36.91	25.934				
10,000.00	9,996.15	9,993.62	9,991.47	20.00	17.34	84.49	-4.86	-1,017.47	957.55	920.22	37.33	25.651				
10,100.00	10,096.08	10,090.16	10,088.00	20.25	17.50	70.67	-5.25	-1,018.17	957.56	919.81	37.75	25.369				
10,200.00	10,196.03	10,183.84	10,181.69	20.49	17.67	41.89	-5.57	-1,019.31	957.08	918.93	38.15	25.086				
10,300.00	10,296.00	10,281.03	10,278.85	20.71	17.84	3.87	-6.34	-1,021.09	956.51	917.97	38.54	24.818				
10,379.86	10,375.84	10,358.69	10,356.49	20.85	17.97	-22.51	-7.20	-1,022.72	956.33	917.52	38.81	24.639				
10,400.00	10,395.97	10,378.23	10,376.02	20.89	18.01	-29.53	-7.34	-1,023.15	956.29	917.40	38.88	24.594				
10,500.00	10,495.95	10,486.44	10,484.21	21.01	18.19	-52.51	-8.11	-1,025.22	956.58	917.38	39.20	24.400				
10,600.00	10,595.94	10,591.02	10,588.78	21.08	18.38	-37.19	-9.40	-1,026.41	956.42	916.97	39.45	24.241				
10,700.00	10,695.63	10,690.01	10,687.76	21.11	18.55	-76.02	-10.66	-1,027.37	954.85	915.20	39.65	24.083				
10,800.00	10,791.50	10,770.01	10,767.65	21.12	18.66	-86.41	-7.78	-1,028.30	952.73	912.99	39.74	23.975				
10,848.61	10,835.61	10,812.00	10,809.26	21.14	18.71	-85.78	-2.25	-1,028.91	952.69	912.90	39.79	23.942				
10,900.00	10,880.02	10,848.91	10,845.33	21.16	18.73	-85.52	5.49	-1,029.46	953.24	913.43	39.81	23.944				
11,000.00	10,958.70	11,036.98	11,009.17	21.24	18.82	-87.09	93.68	-1,020.34	947.15	907.16	39.99	23.685				
11,100.00	11,026.51	11,121.80	11,070.57	21.37	18.88	-88.60	151.33	-1,011.22	935.94	895.72	40.22	23.272				
11,200.00	11,083.86	11,190.00	11,113.48	21.58	18.96	-89.31	203.93	-1,005.04	926.30	885.76	40.53	22.852				
11,300.00	11,126.68	11,273.47	11,157.70	21.87	19.15	-90.63	274.45	-999.82	918.83	877.80	41.02	22.397				
11,400.00	11,154.67	11,354.01	11,190.77	22.26	19.41	-92.31	347.75	-996.27	915.10	873.44	41.66	21.966				
11,400.42	11,154.76	11,354.34	11,190.89	22.26	19.41	-92.31	348.06	-996.26	915.10	873.44	41.66	21.965 CC				
11,500.00	11,166.33	11,426.00	11,212.88	22.74	19.68	-93.03	416.21	-995.36	918.49	876.09	42.40	21.664				
11,600.00	11,169.52	11,490.46	11,225.66	23.29	19.98	-93.66	479.32	-997.51	926.98	883.76	43.22	21.447				
11,700.00	11,170.81	11,610.27	11,230.70	23.93	20.64	-93.67	598.75	-1,002.45	934.54	890.01	44.52	20.989				
11,800.00	11,170.08	11,710.24	11,227.06	24.63	21.29	-93.45	698.60	-1,005.84	939.36	893.49	45.87	20.479				
11,900.00	11,168.76	11,804.57	11,223.29	25.39	21.97	-93.29	792.79	-1,009.37	942.71	895.40	47.31	19.926				
12,000.00	11,167.38	11,903.02	11,221.00	26.22	22.74	-93.23	891.12	-1,013.62	945.80	896.89	48.91	19.339				
12,100.00	11,166.10	12,009.11	11,219.71	27.09	23.65	-93.22	997.14	-1,017.29	948.35	897.66	50.69	18.708				
12,200.00	11,164.16	12,108.45	11,218.26	28.02	24.55	-93.24	1,096.40	-1,020.94	951.66	899.15	52.52	18.121				
12,300.00	11,163.16	12,213.12	11,217.88	28.98	25.56	-93.30	1,201.02	-1,024.21	952.06	897.57	54.49	17.472				
12,400.00	11,160.99	12,340.79	11,216.13	29.99	26.85	-93.37	1,328.65	-1,026.70	950.82	894.02	56.80	16.739				
12,500.00	11,158.27	12,440.00	11,214.42	31.03	27.89	-93.45	1,427.84	-1,026.63	947.44	888.56	58.88	16.090				
12,600.00	11,155.45	12,536.45	11,213.01	32.11	28.94	-93.53	1,524.28	-1,026.83	944.55	883.55	61.00	15.485				
12,700.00	11,152.55	12,636.03	11,211.45	33.21	30.05	-93.61	1,623.84	-1,027.47	942.83	879.62	63.21	14.917				
12,800.00	11,149.73	12,752.12	11,209.83	34.34	31.37	-93.70	1,739.91	-1,027.00	940.69	875.03	65.66	14.328				
12,900.00	11,147.73	12,854.19	11,207.36	35.49	32.57	-93.66	1,841.95	-1,025.70	938.38	870.39	67.99	13.802				
13,000.00	11,146.16	12,952.56	11,205.54	36.66	33.73	-93.64	1,940.30	-1,024.54	936.97	866.65	70.32	13.324				
13,088.36	11,143.84	13,040.71	11,202.71	37.70	34.80	-93.60	2,028.39	-1,023.59	936.74	864.31	72.43	12.933				
13,100.00	11,143.37	13,052.15	11,202.38	37.84	34.94	-93.61	2,039.82	-1,023.47	936.86	864.15	72.71	12.885				
13,200.00	11,141.36	13,148.48	11,200.94	39.04	36.12	-93.66	2,136.14	-1,022.52	936.11	861.03	75.09	12.467				
13,300.00	11,140.35	13,245.51	11,201.22	40.27	37.32	-93.74	2,233.17	-1,021.92	934.60	857.10	77.50	12.059				
13,400.00	11,139.55	13,345.91	11,199.44	41.50	38.58	-93.68	2,333.55	-1,021.52	933.56	853.56	79.99	11.670				
13,466.44	11,139.19	13,408.39	11,197.07	42.33	39.37	-93.56	2,395.98	-1,021.36	933.21	851.59	81.62	11.434				
13,500.00	11,139.16	13,436.59	11,196.16	42.75	39.73	-93.50	2,424.17	-1,021.46	933.45	851.05	82.39	11.329				
13,600.00	11,138.10	13,520.64	11,194.52	44.01	40.80	-93.45	2,508.19	-1,022.66	934.30	849.59	84.71	11.029				
13,700.00	11,136.36	13,610.91	11,192.57	45.28	41.97	-93.41	2,598.39	-1,025.42	936.63	849.51	87.13	10.750				
13,800.00	11,134.44	13,715.80	11,190.76	46.56	43.34	-93.40	2,703.22	-1,028.69	940.20	850.42	89.78	10.472				
13,900.00	11,131.99	13,838.57	11,188.79	47.85	44.95	-93.47	2,825.95	-1,030.95	941.37	848.66	92.70	10.154				
14,000.00	11,129.35	13,940.97	11,188.12	49.15	46.29	-93.58	2,928.34	-1,030.85	940.63	845.29	95.34	9.866				

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 303H - ST01 / Job #61822 - Surveys (H&P 482)													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD, 10761-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 +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,014.65	11,129.01	13,954.00	11,187.87	49.34	46.47	-93.59	2,941.37	-1,030.86	940.61	844.91	95.70	9.828		
14,100.00	11,127.30	14,024.65	11,186.32	50.46	47.40	-93.58	3,012.00	-1,031.59	941.52	843.77	97.74	9.633		
14,200.00	11,125.53	14,141.08	11,182.33	51.78	48.95	-93.47	3,128.34	-1,033.38	941.61	840.99	100.63	9.358		
14,300.00	11,123.66	14,246.48	11,178.67	53.10	50.36	-93.35	3,233.67	-1,033.19	941.03	837.68	103.36	9.105		
14,305.34	11,123.56	14,251.23	11,178.56	53.17	50.43	-93.35	3,238.41	-1,033.17	941.03	837.54	103.49	9.093		
14,400.00	11,121.94	14,335.93	11,176.22	54.42	51.56	-93.29	3,323.08	-1,033.34	942.04	836.15	105.88	8.897		
14,500.00	11,120.47	14,447.89	11,173.50	55.75	53.07	-93.22	3,435.01	-1,033.32	943.22	834.49	108.72	8.675		
14,600.00	11,118.28	14,550.31	11,170.05	57.09	54.46	-93.16	3,537.37	-1,032.55	942.68	831.23	111.44	8.459		
14,700.00	11,115.63	14,646.73	11,167.64	58.43	55.77	-93.17	3,633.75	-1,031.91	942.12	828.03	114.09	8.258		
14,800.00	11,113.90	14,751.88	11,164.07	59.78	57.20	-93.06	3,738.85	-1,031.52	941.71	824.84	116.87	8.058		
14,900.00	11,112.44	14,864.76	11,161.49	61.13	58.73	-93.07	3,851.67	-1,029.32	938.78	819.04	119.73	7.840		
15,000.00	11,107.78	14,971.90	11,157.60	62.49	60.19	-93.32	3,958.70	-1,026.47	933.37	810.85	122.52	7.618		
15,100.00	11,100.29	15,069.58	11,156.23	63.86	61.53	-93.77	4,056.32	-1,023.33	926.92	801.73	125.20	7.404		
15,200.00	11,093.78	15,167.35	11,154.75	65.23	62.86	-93.94	4,154.03	-1,020.49	921.51	793.64	127.88	7.206		
15,300.00	11,090.64	15,244.27	11,153.01	66.60	63.92	-93.91	4,230.91	-1,019.14	918.15	787.81	130.34	7.044		
15,344.64	11,089.74	15,279.00	11,152.39	67.21	64.40	-93.92	4,265.64	-1,019.29	917.85	786.43	131.42	6.984		
15,400.00	11,088.46	15,326.80	11,151.31	67.97	65.06	-93.90	4,313.43	-1,019.97	918.28	785.45	132.83	6.913		
15,500.00	11,085.18	15,436.56	11,147.56	69.34	66.59	-93.87	4,423.10	-1,021.79	920.51	784.78	135.73	6.782		
15,600.00	11,082.81	15,552.34	11,146.73	70.72	68.19	-94.01	4,538.86	-1,021.19	919.59	780.90	138.69	6.631		
15,700.00	11,080.37	15,651.33	11,147.86	72.10	69.56	-94.24	4,637.84	-1,019.91	917.54	776.12	141.41	6.488		
15,800.00	11,077.84	15,756.24	11,145.33	73.48	71.02	-94.24	4,742.70	-1,018.51	916.17	771.94	144.23	6.352		
15,844.99	11,076.78	15,791.00	11,144.00	74.10	71.50	-94.21	4,777.43	-1,018.01	915.72	770.37	145.35	6.300		
15,859.00	11,076.45	15,791.00	11,144.00	74.30	71.50	-94.21	4,777.43	-1,018.01	915.83	770.30	145.54	6.293 ES, SF		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 403H - OH - Plan 1 08-29-17												Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-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	1.00	0.00	0.00	0.00	-90.43	-7.38	-979.17	979.20				
100.00	100.00	101.00	100.00	0.14	0.10	84.46	-7.38	-979.17	979.21	978.97	0.24	4,121.041	
200.00	200.00	201.00	200.00	0.40	0.37	75.64	-7.38	-979.17	979.14	978.38	0.76	1,284.091	
300.00	300.00	301.00	300.00	0.66	0.63	83.05	-7.38	-979.17	979.09	977.80	1.29	758.185	
400.00	400.00	401.00	400.00	0.91	0.90	53.54	-7.38	-979.17	979.02	977.21	1.81	540.524	
500.00	500.00	501.00	500.00	1.16	1.16	64.19	-7.38	-979.17	978.83	976.50	2.32	421.596	
600.00	600.00	601.00	600.00	1.42	1.43	78.56	-7.38	-979.17	978.73	975.89	2.84	344.070	
700.00	700.00	701.00	700.00	1.68	1.69	74.32	-7.38	-979.17	978.67	975.29	3.37	289.993	
800.00	800.00	801.00	800.00	1.95	1.96	76.27	-7.38	-979.17	978.56	974.66	3.91	250.568	
900.00	900.00	901.00	900.00	2.21	2.22	62.67	-7.38	-979.17	978.47	974.04	4.43	220.654	
1,000.00	1,000.00	1,001.00	1,000.00	2.47	2.49	64.68	-7.38	-979.17	978.33	973.37	4.96	197.130	
1,100.00	1,100.00	1,101.00	1,100.00	2.73	2.76	42.38	-7.38	-979.17	978.23	972.75	5.48	178.401	
1,200.00	1,200.00	1,201.00	1,200.00	2.98	3.02	55.46	-7.38	-979.17	978.13	972.13	6.00	162.959	
1,300.00	1,299.99	1,300.99	1,299.99	3.24	3.29	54.51	-7.38	-979.17	978.01	971.48	6.53	149.789	
1,400.00	1,399.99	1,400.99	1,399.99	3.50	3.55	51.56	-7.38	-979.17	977.84	970.79	7.06	138.588	
1,500.00	1,499.99	1,500.99	1,499.99	3.77	3.82	52.13	-7.38	-979.17	977.63	970.05	7.58	128.937	
1,600.00	1,599.99	1,600.99	1,599.99	4.02	4.08	46.68	-7.38	-979.17	977.41	969.30	8.11	120.559	
1,700.00	1,699.99	1,700.99	1,699.99	4.24	4.35	2.16	-7.38	-979.17	977.23	968.64	8.59	113.751	
1,747.38	1,747.37	1,748.37	1,747.37	4.28	4.47	-90.00	-7.38	-979.17	977.21	968.46	8.75	111.656	
1,800.00	1,799.99	1,800.99	1,799.99	4.32	4.61	-103.12	-7.38	-979.17	977.25	968.32	8.93	109.426	
1,900.00	1,899.99	1,900.99	1,899.99	4.31	4.88	-112.98	-7.38	-979.17	977.43	968.24	9.19	106.358	
2,000.00	1,999.99	2,000.99	1,999.99	4.32	5.14	-111.37	-7.38	-979.17	977.63	968.17	9.46	103.309	
2,100.00	2,099.99	2,100.99	2,099.99	4.34	5.41	-110.12	-7.38	-979.17	977.83	968.08	9.75	100.259	
2,200.00	2,199.99	2,200.99	2,199.99	4.38	5.68	-121.78	-7.38	-979.17	978.08	968.02	10.06	97.236	
2,300.00	2,299.99	2,300.99	2,299.99	4.45	5.94	-159.67	-7.38	-979.17	978.35	967.95	10.39	94.123	
2,400.00	2,399.98	2,400.98	2,399.98	4.57	6.21	164.23	-7.38	-979.17	978.65	967.87	10.78	90.798	
2,500.00	2,499.98	2,500.98	2,499.98	4.71	6.47	-169.86	-7.38	-979.17	979.06	967.88	11.18	87.588	
2,600.00	2,599.98	2,600.98	2,599.98	4.83	6.74	-168.68	-7.38	-979.17	979.64	968.08	11.57	84.679	
2,700.00	2,699.98	2,700.98	2,699.98	4.96	7.00	-161.74	-7.38	-979.17	980.46	968.49	11.97	81.942	
2,800.00	2,799.97	2,800.97	2,799.97	5.11	7.27	-171.90	-7.38	-979.17	981.63	969.25	12.37	79.334	
2,900.00	2,899.96	2,900.96	2,899.96	5.26	7.53	-165.21	-7.38	-979.17	982.97	970.18	12.79	76.836	
3,000.00	2,999.95	3,000.95	2,999.95	5.43	7.80	-176.22	-7.38	-979.17	984.62	971.40	13.23	74.452	
3,100.00	3,099.94	3,100.94	3,099.94	5.62	8.06	123.91	-7.38	-979.17	985.71	972.02	13.69	72.022	
3,200.00	3,199.94	3,200.94	3,199.94	5.80	8.33	-13.78	-7.38	-979.17	985.47	971.34	14.13	69.759	
3,300.00	3,299.94	3,300.94	3,299.94	5.92	8.59	-71.22	-7.38	-979.17	985.03	970.52	14.52	67.846	
3,393.87	3,393.80	3,394.80	3,393.80	6.03	8.84	-90.00	-7.38	-979.17	984.91	970.04	14.88	66.203	
3,400.00	3,399.93	3,400.93	3,399.93	6.04	8.86	-91.37	-7.38	-979.17	984.96	970.06	14.90	66.102	
3,500.00	3,499.93	3,500.93	3,499.93	6.17	9.13	-97.29	-7.38	-979.17	985.00	969.70	15.29	64.413	
3,600.00	3,599.93	3,600.93	3,599.93	6.30	9.39	-67.74	-7.38	-979.17	985.04	969.35	15.69	62.764	
3,700.00	3,699.93	3,700.93	3,699.93	6.45	9.66	-18.14	-7.38	-979.17	984.56	968.45	16.11	61.115	
3,800.00	3,799.92	3,800.92	3,799.92	6.62	9.92	-4.21	-7.38	-979.17	983.92	967.37	16.54	59.485	
3,900.00	3,899.92	3,900.92	3,899.92	6.79	10.19	2.52	-7.38	-979.17	983.04	966.06	16.98	57.888	
4,000.00	3,999.92	4,000.92	3,999.92	6.97	10.45	-13.55	-7.38	-979.17	982.07	964.64	17.43	56.355	
4,100.00	4,099.91	4,100.91	4,099.91	7.15	10.72	-17.45	-7.38	-979.17	981.15	963.28	17.87	54.901	
4,200.00	4,199.90	4,200.90	4,199.90	7.34	10.98	-8.10	-7.38	-979.17	980.02	961.70	18.32	53.487	
4,284.82	4,284.72	4,285.72	4,284.72	7.50	11.21	95.45	-7.38	-979.17	979.54	960.84	18.71	52.360	
4,300.00	4,299.90	4,300.90	4,299.90	7.53	11.25	106.92	-7.38	-979.17	979.47	960.69	18.78	52.164	
4,400.00	4,399.90	4,400.90	4,399.90	7.71	11.51	-26.51	-7.38	-979.17	979.21	959.98	19.23	50.930	
4,500.00	4,499.89	4,500.89	4,499.89	7.89	11.78	-34.88	-7.38	-979.17	978.25	958.57	19.67	49.721	
4,600.00	4,599.89	4,600.89	4,599.89	8.08	12.05	-31.24	-7.38	-979.17	977.40	957.27	20.13	48.563	
4,700.00	4,699.88	4,700.88	4,699.88	8.27	12.31	-39.26	-7.38	-979.17	976.59	956.01	20.58	47.457	
4,800.00	4,799.88	4,800.88	4,799.88	8.45	12.58	65.85	-7.38	-979.17	976.24	955.21	21.03	46.419	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 403H - OH - Plan 1 08-29-17											Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-MWD+HDGM											Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		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
4,900.00	4,899.87	4,900.87	4,899.87	8.65	12.84	-35.82	-7.38	-979.17	975.57	954.08	21.49	45.401
5,000.00	4,999.87	5,000.87	4,999.87	8.84	13.11	-39.27	-7.38	-979.17	974.72	952.78	21.95	44.414
5,100.00	5,099.86	5,100.86	5,099.86	9.03	13.37	-39.61	-7.38	-979.17	973.97	951.57	22.41	43.467
5,200.00	5,199.86	5,200.86	5,199.86	9.23	13.64	-53.03	-7.38	-979.17	973.21	950.34	22.87	42.558
5,300.00	5,299.85	5,300.85	5,299.85	9.42	13.90	-45.10	-7.38	-979.17	972.60	949.27	23.33	41.691
5,400.00	5,399.85	5,400.85	5,399.85	9.63	14.17	-24.78	-7.38	-979.17	971.76	947.96	23.80	40.829
5,500.00	5,499.85	5,500.85	5,499.85	9.85	14.43	1.80	-7.38	-979.17	971.32	947.04	24.28	40.002
5,555.59	5,555.43	5,556.43	5,555.43	9.95	14.58	90.07	-7.38	-979.17	971.24	946.70	24.53	39.590
5,600.00	5,599.85	5,600.85	5,599.85	10.03	14.70	140.46	-7.38	-979.17	971.24	946.51	24.73	39.271
5,700.00	5,699.84	5,700.84	5,699.84	10.19	14.97	86.58	-7.38	-979.17	971.47	946.31	25.16	38.616
5,800.00	5,799.84	5,800.84	5,799.84	10.37	15.23	75.03	-7.38	-979.17	971.35	945.75	25.60	37.937
5,900.00	5,899.84	5,901.05	5,900.05	10.56	15.46	76.57	-7.42	-979.17	971.24	945.22	26.03	37.317
6,000.00	5,999.83	6,002.02	6,001.01	10.76	15.43	71.41	-8.67	-979.08	970.67	944.48	26.19	37.066
6,100.00	6,099.75	6,103.00	6,101.94	10.96	15.40	69.70	-11.71	-978.87	969.21	942.85	26.36	36.770
6,200.00	6,199.65	6,203.96	6,202.79	11.16	15.38	66.86	-16.51	-978.53	967.25	940.71	26.54	36.447
6,300.00	6,299.55	6,304.64	6,303.26	11.37	15.36	67.62	-23.01	-978.06	965.17	938.45	26.73	36.112
6,400.00	6,399.46	6,404.58	6,402.95	11.58	15.34	66.20	-29.97	-977.57	963.09	936.16	26.92	35.772
6,500.00	6,499.38	6,504.50	6,502.63	11.79	15.34	66.90	-36.93	-977.08	961.18	934.05	27.13	35.434
6,600.00	6,599.32	6,604.42	6,602.30	12.01	15.33	68.44	-43.88	-976.59	959.49	932.15	27.33	35.101
6,700.00	6,699.26	6,704.33	6,701.98	12.22	15.33	70.40	-50.84	-976.09	958.07	930.52	27.55	34.776
6,800.00	6,799.17	6,804.27	6,801.67	12.44	15.34	65.82	-57.79	-975.60	956.23	928.46	27.77	34.432
6,900.00	6,899.07	6,904.20	6,901.36	12.66	15.35	65.02	-64.75	-975.11	954.03	926.03	28.00	34.070
7,000.00	6,998.97	7,004.14	7,001.05	12.88	15.36	62.88	-71.71	-974.62	951.91	923.67	28.24	33.709
7,100.00	7,098.86	7,104.06	7,100.73	13.11	15.38	58.40	-78.66	-974.12	949.43	920.95	28.48	33.331
7,200.00	7,198.77	7,203.98	7,200.40	13.34	15.40	61.16	-85.62	-973.63	947.01	918.27	28.74	32.954
7,300.00	7,298.67	7,303.92	7,300.10	13.56	15.43	73.27	-92.57	-973.14	945.11	916.12	28.99	32.600
7,400.00	7,398.55	7,403.88	7,399.82	13.78	15.47	73.47	-99.53	-972.64	943.66	914.41	29.25	32.264
7,500.00	7,498.44	7,503.83	7,499.52	14.01	15.50	60.01	-106.49	-972.15	941.71	912.20	29.51	31.907
7,600.00	7,598.30	7,603.71	7,599.16	14.25	15.55	61.57	-113.44	-971.66	938.93	909.14	29.79	31.518
7,700.00	7,698.13	7,703.49	7,698.75	14.48	15.59	57.98	-119.52	-971.23	935.94	905.86	30.07	31.123
7,800.00	7,797.98	7,803.24	7,798.40	14.72	15.64	58.49	-123.87	-970.92	932.97	902.61	30.36	30.731
7,900.00	7,897.86	7,902.97	7,898.10	14.96	15.70	59.98	-126.49	-970.73	930.40	899.75	30.65	30.353
8,000.00	7,997.77	8,002.65	7,997.78	15.19	15.85	61.67	-127.38	-970.67	928.44	897.40	31.04	29.908
8,100.00	8,097.70	8,102.58	8,097.70	15.43	16.10	59.44	-127.38	-970.67	926.58	895.05	31.53	29.388
8,200.00	8,197.64	8,202.52	8,197.64	15.67	16.35	63.30	-127.38	-970.67	924.79	892.78	32.02	28.884
8,300.00	8,297.56	8,302.44	8,297.56	15.91	16.60	70.88	-127.38	-970.67	923.31	890.81	32.50	28.405
8,400.00	8,397.45	8,402.33	8,397.45	16.15	16.85	73.98	-127.38	-970.67	921.92	888.93	32.99	27.945
8,500.00	8,497.32	8,502.20	8,497.32	16.38	17.10	75.58	-127.38	-970.67	920.55	887.07	33.48	27.498
8,600.00	8,597.19	8,602.06	8,597.19	16.62	17.35	77.64	-127.38	-970.67	919.38	885.42	33.96	27.069
8,700.00	8,697.07	8,701.94	8,697.07	16.85	17.61	80.60	-127.38	-970.67	918.42	883.97	34.45	26.659
8,800.00	8,796.96	8,801.83	8,796.96	17.09	17.86	78.70	-127.38	-970.67	917.66	882.72	34.94	26.265
8,900.00	8,896.87	8,901.74	8,896.87	17.33	18.11	65.77	-127.38	-970.67	916.49	881.06	35.43	25.867
9,000.00	8,996.80	9,001.68	8,996.80	17.57	18.36	70.73	-127.38	-970.67	915.03	879.10	35.93	25.469
9,100.00	9,096.75	9,101.63	9,096.75	17.82	18.62	52.18	-127.38	-970.67	913.58	877.16	36.43	25.081
9,200.00	9,196.70	9,201.58	9,196.70	18.06	18.87	22.96	-127.38	-970.67	911.17	874.25	36.92	24.679
9,300.00	9,296.64	9,301.52	9,296.64	18.30	19.12	31.54	-127.38	-970.67	908.13	870.71	37.41	24.273
9,400.00	9,396.58	9,401.45	9,396.58	18.54	19.38	50.67	-127.38	-970.67	905.43	867.52	37.91	23.882
9,500.00	9,496.53	9,501.41	9,496.53	18.79	19.63	56.33	-127.38	-970.67	903.54	865.12	38.42	23.520
9,600.00	9,596.47	9,601.34	9,596.47	19.03	19.89	81.32	-127.38	-970.67	902.54	863.63	38.91	23.194
9,700.00	9,696.39	9,701.27	9,696.39	19.27	20.14	81.69	-127.38	-970.67	901.98	862.57	39.41	22.889
9,800.00	9,796.32	9,801.20	9,796.32	19.51	20.40	81.53	-127.38	-970.67	901.44	861.54	39.90	22.591
9,900.00	9,896.23	9,901.11	9,896.23	19.75	20.65	79.92	-127.38	-970.67	900.74	860.34	40.40	22.296

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 403H - OH - Plan 1 08-29-17													Offset Site Error: 0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-MWD+HDM													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)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
10,000.00	9,996.15	10,001.02	9,996.15	20.00	20.91	77.23	-127.38	-970.67	899.97	859.07	40.90	22.004	
10,100.00	10,096.08	10,100.96	10,096.08	20.25	21.16	63.44	-127.38	-970.67	898.88	857.47	41.40	21.711	
10,200.00	10,196.03	10,200.91	10,196.03	20.49	21.42	34.69	-127.38	-970.67	896.93	855.03	41.90	21.404	
10,300.00	10,296.00	10,300.88	10,296.00	20.71	21.68	-3.30	-127.38	-970.67	894.58	852.20	42.38	21.108	
10,400.00	10,395.97	10,400.85	10,395.97	20.89	21.93	-36.65	-127.38	-970.67	892.50	849.69	42.81	20.848	
10,500.00	10,495.95	10,500.83	10,495.95	21.01	22.19	-59.58	-127.38	-970.67	891.18	847.98	43.20	20.631	
10,600.00	10,595.94	10,600.82	10,595.94	21.08	22.45	-44.18	-127.38	-970.67	890.25	846.72	43.52	20.455	
10,700.00	10,695.63	10,700.50	10,695.63	21.11	22.70	-82.96	-127.38	-970.67	888.62	844.82	43.80	20.288	
10,748.99	10,743.44	10,748.32	10,743.44	21.12	22.83	-90.00	-127.38	-970.67	888.11	844.18	43.93	20.217 CC	
10,800.00	10,791.50	10,796.37	10,791.50	21.12	22.95	-93.65	-127.38	-970.67	888.34	844.28	44.06	20.162	
10,900.00	10,880.02	10,884.90	10,880.02	21.16	23.18	-93.57	-127.38	-970.67	892.29	847.96	44.33	20.131	
11,000.00	10,958.70	10,971.05	10,966.15	21.24	23.27	-95.35	-126.26	-970.68	897.74	853.25	44.49	20.180	
11,100.00	11,026.51	11,084.62	11,077.47	21.37	23.28	-99.18	-105.17	-970.83	907.28	862.68	44.59	20.345	
11,200.00	11,083.86	11,232.61	11,209.47	21.58	23.32	-102.33	-39.58	-971.28	917.50	872.78	44.72	20.517	
11,300.00	11,126.68	11,419.36	11,337.19	21.87	23.52	-105.16	95.03	-972.22	924.91	879.92	45.00	20.554	
11,400.00	11,154.67	11,632.24	11,407.72	22.26	24.08	-106.28	294.01	-973.60	927.47	881.63	45.84	20.233	
11,500.00	11,166.33	11,763.52	11,410.38	22.74	24.62	-105.34	425.16	-974.51	929.00	882.13	46.87	19.819	
11,600.00	11,169.52	11,863.30	11,409.51	23.29	25.12	-105.00	524.93	-975.20	933.03	885.13	47.90	19.477	
11,700.00	11,170.81	11,963.19	11,408.64	23.93	25.69	-104.72	624.81	-975.89	936.29	887.22	49.07	19.080	
11,800.00	11,170.08	12,063.16	11,407.77	24.63	26.33	-104.66	724.78	-976.59	938.49	888.13	50.36	18.634	
11,900.00	11,168.76	12,163.15	11,406.89	25.39	27.03	-104.69	824.77	-977.28	939.05	887.27	51.78	18.137	
12,000.00	11,167.38	12,263.15	11,406.02	26.22	27.79	-104.73	924.76	-977.97	938.72	885.42	53.30	17.612	
12,067.99	11,166.43	12,331.14	11,405.43	26.81	28.33	-104.75	992.74	-978.45	938.65	884.26	54.40	17.256	
12,100.00	11,166.10	12,363.15	11,405.15	27.09	28.60	-104.75	1,024.75	-978.67	938.64	883.71	54.92	17.090	
12,200.00	11,164.16	12,463.14	11,404.28	28.02	29.46	-104.82	1,124.74	-979.36	939.20	882.56	56.64	16.582	
12,300.00	11,163.16	12,563.12	11,403.40	28.98	30.36	-104.88	1,224.71	-980.06	937.25	878.81	58.44	16.037	
12,400.00	11,160.99	12,663.08	11,402.53	29.99	31.31	-105.01	1,324.66	-980.75	935.02	874.70	60.32	15.501	
12,500.00	11,158.27	12,763.02	11,401.66	31.03	32.29	-105.17	1,424.60	-981.44	932.91	870.65	62.26	14.985	
12,600.00	11,155.45	12,862.97	11,400.79	32.11	33.30	-105.31	1,524.54	-982.14	931.00	866.74	64.26	14.489	
12,700.00	11,152.55	12,962.94	11,399.91	33.21	34.35	-105.45	1,624.50	-982.83	929.86	863.55	66.31	14.023	
12,800.00	11,149.73	13,062.91	11,399.04	34.34	35.42	-105.57	1,724.47	-983.52	929.30	860.88	68.42	13.583	
12,881.77	11,148.08	13,144.68	11,398.33	35.28	36.32	-105.63	1,806.23	-984.09	929.21	859.03	70.18	13.240	
12,900.00	11,147.73	13,162.90	11,398.17	35.49	36.52	-105.64	1,824.46	-984.22	929.29	858.72	70.58	13.167	
12,901.61	11,147.71	13,164.51	11,398.16	35.51	36.54	-105.64	1,826.07	-984.23	929.29	858.68	70.61	13.160	
13,000.00	11,146.16	13,262.90	11,397.30	36.66	37.64	-105.65	1,924.44	-984.91	929.95	857.16	72.79	12.776	
13,100.00	11,143.37	13,362.86	11,396.42	37.84	38.79	-105.73	2,024.41	-985.61	932.09	857.06	75.02	12.424	
13,200.00	11,141.36	13,462.85	11,395.55	39.04	39.95	-105.81	2,124.39	-986.30	933.25	855.95	77.30	12.073	
13,300.00	11,140.35	13,562.85	11,394.68	40.27	41.13	-105.82	2,224.38	-986.99	933.01	853.38	79.63	11.717	
13,331.28	11,140.06	13,594.13	11,394.41	40.65	41.51	-105.82	2,255.66	-987.21	932.99	852.62	80.36	11.610	
13,400.00	11,139.55	13,662.85	11,393.81	41.50	42.33	-105.81	2,324.37	-987.69	933.11	851.12	81.98	11.382	
13,500.00	11,139.16	13,762.84	11,392.93	42.75	43.55	-105.77	2,424.36	-988.38	933.77	849.39	84.38	11.067	
13,600.00	11,138.10	13,862.84	11,392.06	44.01	44.77	-105.78	2,524.35	-989.07	933.99	847.20	86.79	10.762	
13,610.55	11,137.93	13,873.39	11,391.97	44.14	44.90	-105.79	2,534.90	-989.15	933.98	846.94	87.04	10.730	
13,700.00	11,136.36	13,962.84	11,391.19	45.28	46.01	-105.82	2,624.34	-989.77	934.25	845.04	89.21	10.473	
13,800.00	11,134.44	14,062.83	11,390.32	46.56	47.26	-105.86	2,724.32	-990.46	935.63	843.98	91.65	10.209	
13,900.00	11,131.99	14,162.81	11,389.44	47.85	48.53	-105.97	2,824.30	-991.16	935.96	841.87	94.10	9.947	
14,000.00	11,129.35	14,262.80	11,388.57	49.15	49.80	-106.06	2,924.28	-991.85	936.40	839.84	96.56	9.698	
14,100.00	11,127.30	14,362.79	11,387.70	50.46	51.08	-106.13	3,024.27	-992.54	937.38	838.33	99.05	9.464	
14,200.00	11,125.53	14,462.78	11,386.83	51.78	52.37	-106.20	3,124.25	-993.24	936.94	835.38	101.55	9.226	
14,208.48	11,125.37	14,471.26	11,386.75	51.89	52.48	-106.20	3,132.73	-993.30	936.93	835.17	101.77	9.207	
14,300.00	11,123.66	14,562.77	11,385.95	53.10	53.67	-106.24	3,224.24	-993.93	937.60	833.53	104.07	9.009	
14,400.00	11,121.94	14,662.76	11,385.08	54.42	54.97	-106.25	3,324.22	-994.63	939.36	832.74	106.61	8.811	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Corn - 403H - OH - Plan 1 08-29-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-MWD+HDGM														
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)				
14,500.00	11,120.47	14,762.73	11,384.21	55.75	56.28	-106.26	3,424.19	-995.32	941.41	832.24	109.17	8.623		
14,600.00	11,118.28	14,862.72	11,383.34	57.09	57.60	-106.32	3,524.17	-996.01	942.71	830.99	111.72	8.438		
14,700.00	11,115.63	14,962.70	11,382.46	58.43	58.92	-106.41	3,624.14	-996.71	943.98	829.70	114.27	8.261		
14,800.00	11,113.90	15,062.69	11,381.59	59.78	60.25	-106.46	3,724.13	-997.40	944.91	828.06	116.85	8.086		
14,900.00	11,112.44	15,162.69	11,380.72	61.13	61.59	-106.51	3,824.12	-998.09	944.87	825.42	119.44	7.911		
15,000.00	11,107.78	15,262.58	11,379.85	62.49	62.93	-106.83	3,924.01	-998.79	943.92	821.96	121.96	7.740		
15,100.00	11,100.29	15,362.32	11,378.98	63.86	64.27	-107.28	4,023.74	-999.48	943.06	818.67	124.39	7.581		
15,200.00	11,093.78	15,462.13	11,378.11	65.23	65.61	-107.58	4,123.55	-1,000.17	942.70	815.84	126.85	7.431		
15,300.00	11,090.64	15,562.10	11,377.23	66.60	66.97	-107.71	4,223.50	-1,000.87	942.39	812.97	129.41	7.282		
15,323.98	11,090.18	15,586.08	11,377.02	66.93	67.29	-107.73	4,247.48	-1,001.03	942.35	812.31	130.04	7.247		
15,400.00	11,088.46	15,662.09	11,376.36	67.97	68.32	-107.77	4,323.49	-1,001.56	942.66	810.65	132.01	7.141		
15,500.00	11,085.18	15,762.05	11,375.49	69.34	69.68	-107.87	4,423.44	-1,002.25	944.58	809.99	134.59	7.018		
15,600.00	11,082.81	15,862.04	11,374.62	70.72	71.05	-107.99	4,523.42	-1,002.95	945.22	808.04	137.18	6.890		
15,700.00	11,080.37	15,962.02	11,373.74	72.10	72.41	-108.08	4,623.40	-1,003.64	945.40	805.62	139.78	6.763		
15,800.00	11,077.84	16,062.01	11,372.87	73.48	73.78	-108.15	4,723.38	-1,004.34	946.53	804.15	142.39	6.648		
15,859.00	11,076.45	16,117.05	11,372.39	74.30	74.54	-108.18	4,778.42	-1,004.72	947.44	803.57	143.87	6.585 ES, SF		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 404H - OH - Plan 1 09-05-17												Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10928-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)	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	-90.36	-0.25	-40.31	40.32				
100.00	100.00	100.00	100.00	0.14	0.10	84.68	-0.25	-40.31	40.33	40.09	0.23	171.628	
200.00	200.00	200.00	200.00	0.40	0.36	76.16	-0.25	-40.31	40.26	39.50	0.76	52.978	
300.00	300.00	300.00	300.00	0.66	0.63	84.08	-0.25	-40.31	40.21	38.92	1.29	31.202	
400.00	400.00	400.00	400.00	0.91	0.89	54.93	-0.25	-40.31	40.15	38.34	1.81	22.198	
500.00	500.00	500.00	500.00	1.16	1.16	65.87	-0.25	-40.31	39.96	37.64	2.32	17.231	
600.00	600.00	600.00	600.00	1.42	1.43	80.76	-0.25	-40.31	39.88	37.04	2.84	14.032	
700.00	700.00	700.00	700.00	1.68	1.69	76.88	-0.25	-40.31	39.83	36.45	3.37	11.811	
800.00	800.00	800.00	800.00	1.95	1.96	79.37	-0.25	-40.31	39.74	35.84	3.90	10.182	
900.00	900.00	900.00	900.00	2.21	2.22	66.15	-0.25	-40.31	39.66	35.23	4.43	8.950	
1,000.00	1,000.00	1,000.00	1,000.00	2.47	2.49	68.53	-0.25	-40.31	39.54	34.58	4.96	7.972	
1,100.00	1,100.00	1,100.00	1,100.00	2.73	2.75	46.48	-0.25	-40.31	39.45	33.97	5.48	7.198	
1,200.00	1,200.00	1,200.00	1,200.00	2.98	3.02	59.74	-0.25	-40.31	39.36	33.36	6.00	6.560	
1,300.00	1,299.99	1,299.99	1,299.99	3.24	3.28	59.03	-0.25	-40.31	39.26	32.73	6.53	6.015	
1,400.00	1,399.99	1,399.99	1,399.99	3.50	3.55	56.40	-0.25	-40.31	39.10	32.05	7.05	5.544	
1,500.00	1,499.99	1,499.99	1,499.99	3.77	3.81	57.38	-0.25	-40.31	38.92	31.34	7.58	5.135	
1,600.00	1,599.99	1,599.99	1,599.99	4.02	4.08	52.33	-0.25	-40.31	38.72	30.62	8.10	4.778	
1,700.00	1,699.99	1,699.99	1,699.99	4.24	4.35	8.09	-0.25	-40.31	38.56	29.97	8.59	4.490	
1,761.44	1,761.43	1,761.43	1,761.43	4.29	4.51	-90.00	-0.25	-40.31	38.53	29.74	8.80	4.380	
1,800.00	1,799.99	1,799.99	1,799.99	4.32	4.61	-97.63	-0.25	-40.31	38.55	29.62	8.93	4.318	
1,900.00	1,899.99	1,899.99	1,899.99	4.31	4.88	-108.24	-0.25	-40.31	38.68	29.49	9.19	4.210	
2,000.00	1,999.99	1,999.99	1,999.99	4.32	5.14	-107.30	-0.25	-40.31	38.85	29.39	9.46	4.107	
2,100.00	2,099.99	2,099.99	2,099.99	4.34	5.41	-106.88	-0.25	-40.31	39.01	29.26	9.75	4.001	
2,200.00	2,199.99	2,199.99	2,199.99	4.38	5.67	-119.33	-0.25	-40.31	39.23	29.17	10.06	3.901	
2,300.00	2,299.99	2,299.99	2,299.99	4.45	5.94	-157.60	-0.25	-40.31	39.49	29.10	10.39	3.800	
2,400.00	2,399.98	2,399.98	2,399.98	4.57	6.20	166.30	-0.25	-40.31	39.79	29.02	10.78	3.693	
2,500.00	2,499.98	2,499.98	2,499.98	4.71	6.47	-167.76	-0.25	-40.31	40.20	29.03	11.18	3.597	
2,600.00	2,599.98	2,599.98	2,599.98	4.83	6.73	-166.79	-0.25	-40.31	40.78	29.22	11.57	3.526	
2,700.00	2,699.98	2,699.98	2,699.98	4.96	7.00	-160.17	-0.25	-40.31	41.59	29.63	11.96	3.477	
2,800.00	2,799.97	2,799.97	2,799.97	5.11	7.27	-170.71	-0.25	-40.31	42.75	30.38	12.37	3.456	
2,900.00	2,899.96	2,899.96	2,899.96	5.26	7.53	-164.41	-0.25	-40.31	44.09	31.30	12.79	3.447	
3,000.00	2,999.95	2,999.95	2,999.95	5.43	7.80	-175.79	-0.25	-40.31	45.74	32.52	13.22	3.459	
3,100.00	3,099.94	3,099.94	3,099.94	5.62	8.06	124.77	-0.25	-40.31	46.83	33.15	13.68	3.422	
3,200.00	3,199.94	3,199.94	3,199.94	5.80	8.33	-12.62	-0.25	-40.31	46.60	32.47	14.12	3.299	
3,300.00	3,299.94	3,299.94	3,299.94	5.92	8.59	-70.69	-0.25	-40.31	46.15	31.64	14.52	3.179	
3,392.63	3,392.57	3,392.57	3,392.57	6.03	8.84	-90.00	-0.25	-40.31	46.03	31.16	14.87	3.096	
3,400.00	3,399.93	3,399.93	3,399.93	6.04	8.86	-91.72	-0.25	-40.31	46.07	31.18	14.90	3.093	
3,500.00	3,499.93	3,499.93	3,499.93	6.17	9.12	-98.42	-0.25	-40.31	46.12	30.83	15.29	3.017	
3,600.00	3,599.93	3,599.93	3,599.93	6.30	9.39	-69.57	-0.25	-40.31	46.18	30.49	15.69	2.943	
3,700.00	3,699.93	3,699.93	3,699.93	6.45	9.65	-20.41	-0.25	-40.31	45.72	29.61	16.11	2.838	
3,800.00	3,799.92	3,799.92	3,799.92	6.62	9.92	-6.61	-0.25	-40.31	45.07	28.53	16.54	2.725	
3,900.00	3,899.92	3,899.92	3,899.92	6.79	10.18	0.04	-0.25	-40.31	44.20	27.22	16.98	2.603	
4,000.00	3,999.92	3,999.92	3,999.92	6.97	10.45	-16.12	-0.25	-40.31	43.23	25.81	17.42	2.481	
4,100.00	4,099.91	4,099.91	4,099.91	7.15	10.72	-20.48	-0.25	-40.31	42.32	24.46	17.87	2.369	
4,200.00	4,199.90	4,199.90	4,199.90	7.34	10.98	-11.55	-0.25	-40.31	41.22	22.90	18.32	2.250	
4,287.09	4,286.99	4,286.99	4,286.99	7.50	11.21	94.44	-0.25	-40.31	40.72	22.01	18.72	2.176	
4,300.00	4,299.90	4,299.90	4,299.90	7.53	11.25	103.91	-0.25	-40.31	40.64	21.87	18.77	2.165	
4,400.00	4,399.90	4,399.90	4,399.90	7.71	11.51	-29.08	-0.25	-40.31	40.37	21.14	19.22	2.100	
4,500.00	4,499.89	4,499.89	4,499.89	7.89	11.78	-38.30	-0.25	-40.31	39.44	19.77	19.67	2.005	
4,600.00	4,599.89	4,599.89	4,599.89	8.08	12.04	-35.49	-0.25	-40.31	38.62	18.50	20.12	1.919	
4,700.00	4,699.88	4,699.88	4,699.88	8.27	12.31	-44.63	-0.25	-40.31	37.87	17.30	20.58	1.841	
4,800.00	4,799.88	4,799.88	4,799.88	8.45	12.57	60.97	-0.25	-40.31	37.50	16.47	21.03	1.783	

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 404H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft
Survey Program: 0-NS-GYRO-MS, 10928-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
4,900.00	4,899.87	4,899.87	4,899.87	8.65	12.84	-41.04	-0.25	-40.31	36.84	15.36	21.49	1.715	
5,000.00	4,999.87	4,999.87	4,999.87	8.84	13.10	-45.63	-0.25	-40.31	36.07	14.12	21.94	1.644	
5,100.00	5,099.86	5,099.86	5,099.86	9.03	13.37	-47.04	-0.25	-40.31	35.40	12.99	22.40	1.580	
5,200.00	5,199.86	5,199.86	5,199.86	9.23	13.64	-61.77	-0.25	-40.31	34.75	11.88	22.87	1.520	
5,300.00	5,299.85	5,299.85	5,299.85	9.42	13.90	-55.49	-0.25	-40.31	34.29	10.97	23.33	1.470 Level 3	
5,400.00	5,399.85	5,399.85	5,399.85	9.63	14.17	-36.28	-0.25	-40.31	33.57	9.77	23.80	1.411 Level 3	
5,500.00	5,499.85	5,499.85	5,499.85	9.85	14.43	-10.05	-0.25	-40.31	33.17	8.89	24.28	1.366 Level 3	
5,572.09	5,571.94	5,571.94	5,571.94	9.98	14.62	109.76	-0.25	-40.31	33.08	8.48	24.60	1.345 Level 3	
5,600.00	5,599.85	5,599.85	5,599.85	10.03	14.70	128.77	-0.25	-40.31	33.07	8.34	24.73	1.337 Level 3	
5,700.00	5,699.84	5,699.84	5,699.84	10.19	14.96	75.45	-0.25	-40.31	33.23	8.08	25.15	1.321 Level 3	
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	64.57	-0.25	-40.31	33.04	7.44	25.60	1.290 Level 3	
5,900.00	5,899.84	5,899.84	5,899.84	10.56	15.49	66.80	-0.25	-40.31	32.85	6.80	26.06	1.261 Level 3	
6,000.00	5,999.83	5,999.83	5,999.83	10.76	15.76	64.24	-0.25	-40.31	32.12	5.61	26.52	1.211 Level 2	
6,100.00	6,099.75	6,099.75	6,099.75	10.96	16.02	68.91	-0.25	-40.31	30.59	3.60	26.98	1.134 Level 2	
6,200.00	6,199.65	6,199.65	6,199.65	11.16	16.29	74.27	-0.25	-40.31	29.15	1.70	27.45	1.062 Level 2	
6,300.00	6,299.55	6,299.55	6,299.55	11.37	16.55	83.94	-0.25	-40.31	28.32	0.39	27.92	1.014 Level 2	
6,383.21	6,382.68	6,382.68	6,382.68	11.54	16.78	90.24	-0.25	-40.31	28.13	-0.18	28.32	0.993 Level 1	
6,400.00	6,399.46	6,399.46	6,399.46	11.58	16.82	91.47	-0.25	-40.31	28.12	-0.28	28.40	0.990 Level 1, CC	
6,500.00	6,499.38	6,499.38	6,499.38	11.79	17.09	100.29	-0.25	-40.31	28.54	-0.33	28.88	0.988 Level 1	
6,600.00	6,599.32	6,599.32	6,599.32	12.01	17.35	108.73	-0.25	-40.31	29.36	0.01	29.36	1.000 Level 2	
6,700.00	6,699.26	6,699.26	6,699.26	12.22	17.62	116.84	-0.25	-40.31	30.76	0.93	29.84	1.031 Level 2	
6,800.00	6,799.17	6,799.17	6,799.17	12.44	17.88	119.13	-0.25	-40.31	32.75	2.43	30.32	1.080 Level 2	
6,900.00	6,899.07	6,899.07	6,899.07	12.66	18.15	125.03	-0.25	-40.31	35.08	4.27	30.80	1.139 Level 2	
7,000.00	6,998.97	6,998.97	6,998.97	12.88	18.41	128.62	-0.25	-40.31	37.85	6.56	31.29	1.210 Level 2	
7,100.00	7,098.86	7,098.86	7,098.86	13.11	18.68	129.53	-0.25	-40.31	40.72	8.94	31.78	1.281 Level 3	
7,200.00	7,198.77	7,198.77	7,198.77	13.34	18.94	136.85	-0.25	-40.31	43.62	11.35	32.27	1.352 Level 3	
7,300.00	7,298.67	7,298.67	7,298.67	13.56	19.21	152.38	-0.25	-40.31	47.22	14.45	32.76	1.441 Level 3	
7,400.00	7,398.55	7,398.55	7,398.55	13.78	19.47	155.14	-0.25	-40.31	51.64	18.39	33.25	1.553	
7,500.00	7,498.44	7,498.44	7,498.44	14.01	19.74	144.30	-0.25	-40.31	55.69	21.94	33.74	1.650	
7,600.00	7,598.30	7,598.30	7,598.30	14.25	20.00	148.96	-0.25	-40.31	60.17	25.93	34.24	1.757	
7,700.00	7,698.13	7,698.13	7,698.13	14.48	20.27	148.18	-0.25	-40.31	65.10	30.36	34.74	1.874	
7,800.00	7,797.98	7,797.98	7,797.98	14.72	20.53	151.06	-0.25	-40.31	69.85	34.62	35.24	1.982	
7,900.00	7,897.86	7,897.86	7,897.86	14.96	20.80	154.27	-0.25	-40.31	74.23	38.49	35.74	2.077	
8,000.00	7,997.77	7,997.77	7,997.77	15.19	21.06	157.05	-0.25	-40.31	77.93	41.69	36.24	2.150	
8,100.00	8,097.70	8,097.70	8,097.70	15.43	21.33	155.71	-0.25	-40.31	81.33	44.59	36.74	2.213	
8,200.00	8,197.64	8,197.64	8,197.64	15.67	21.59	160.35	-0.25	-40.31	84.69	47.45	37.25	2.274	
8,300.00	8,297.56	8,297.56	8,297.56	15.91	21.86	168.39	-0.25	-40.31	88.38	50.63	37.75	2.341	
8,400.00	8,397.45	8,397.45	8,397.45	16.15	22.12	171.68	-0.25	-40.31	93.14	54.89	38.25	2.435	
8,500.00	8,497.32	8,497.32	8,497.32	16.38	22.39	173.40	-0.25	-40.31	98.16	59.42	38.75	2.533	
8,600.00	8,597.19	8,597.19	8,597.19	16.62	22.65	175.42	-0.25	-40.31	103.28	64.03	39.25	2.631	
8,700.00	8,697.07	8,697.07	8,697.07	16.85	22.92	178.26	-0.25	-40.31	108.21	68.47	39.74	2.723	
8,800.00	8,796.96	8,796.96	8,796.96	17.09	23.18	176.13	-0.25	-40.31	112.90	72.65	40.24	2.805	
8,900.00	8,896.87	8,896.87	8,896.87	17.33	23.45	163.27	-0.25	-40.31	117.02	76.27	40.75	2.872	
9,000.00	8,996.80	8,996.80	8,996.80	17.57	23.71	168.52	-0.25	-40.31	120.41	79.15	41.25	2.919	
9,100.00	9,096.75	9,096.75	9,096.75	17.82	23.98	150.26	-0.25	-40.31	123.54	81.78	41.76	2.958	
9,200.00	9,196.70	9,196.70	9,196.70	18.06	24.25	121.89	-0.25	-40.31	125.78	83.51	42.27	2.976	
9,300.00	9,296.64	9,296.64	9,296.64	18.30	24.51	131.60	-0.25	-40.31	127.81	85.03	42.77	2.988	
9,400.00	9,396.58	9,396.58	9,396.58	18.54	24.78	151.56	-0.25	-40.31	130.67	87.38	43.28	3.019	
9,500.00	9,496.53	9,496.53	9,496.53	18.79	25.04	157.71	-0.25	-40.31	133.27	89.47	43.80	3.043	
9,600.00	9,596.47	9,596.47	9,596.47	19.03	25.31	-177.39	-0.25	-40.31	136.86	92.55	44.30	3.089	
9,700.00	9,696.39	9,696.39	9,696.39	19.27	25.57	-177.31	-0.25	-40.31	140.62	95.81	44.81	3.138	
9,800.00	9,796.32	9,796.32	9,796.32	19.51	25.84	-177.80	-0.25	-40.31	144.45	99.14	45.31	3.188	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 404H - OH - Plan 1 09-05-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10928-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			
9,900.00	9,896.23	9,896.23	9,896.23	19.75	26.10	-179.71	-0.25	-40.31	148.70	102.88	45.82	3.245			
10,000.00	9,996.15	9,996.15	9,996.15	20.00	26.37	177.37	-0.25	-40.31	152.76	106.43	46.32	3.298			
10,100.00	10,096.08	10,096.08	10,096.08	20.25	26.63	163.51	-0.25	-40.31	156.44	109.61	46.83	3.340			
10,200.00	10,196.03	10,196.03	10,196.03	20.49	26.90	135.15	-0.25	-40.31	159.08	111.73	47.34	3.360			
10,300.00	10,296.00	10,296.00	10,296.00	20.71	27.16	97.92	-0.25	-40.31	160.23	112.40	47.83	3.350			
10,400.00	10,395.97	10,395.97	10,395.97	20.89	27.43	65.41	-0.25	-40.31	159.86	111.60	48.27	3.312			
10,500.00	10,495.95	10,495.95	10,495.95	21.01	27.69	43.16	-0.25	-40.31	158.68	110.01	48.66	3.261			
10,600.00	10,595.94	10,595.94	10,595.94	21.08	27.96	59.10	-0.25	-40.31	157.50	108.51	49.00	3.214			
10,700.00	10,695.63	10,695.63	10,695.63	21.11	28.22	22.17	-0.25	-40.31	152.10	102.81	49.29	3.086			
10,800.00	10,791.50	10,791.50	10,791.50	21.12	28.48	17.36	-0.25	-40.31	125.81	76.24	49.57	2.538			
10,900.00	10,880.02	10,880.02	10,880.02	21.16	28.71	32.28	-0.25	-40.31	82.60	32.77	49.84	1.657			
11,000.00	10,958.70	10,958.53	10,958.51	21.24	28.87	77.91	0.70	-40.53	41.59	-8.49	50.08	0.830 Level 1			
11,019.75	10,972.92	10,973.87	10,973.80	21.26	28.87	91.82	1.90	-40.79	39.70	-10.42	50.12	0.792 Level 1, ES, SF			
11,100.00	11,026.51	11,041.18	11,040.12	21.37	28.88	138.20	12.78	-43.20	63.43	13.95	49.48	1.282 Level 3			
11,200.00	11,083.86	11,139.92	11,133.03	21.58	28.90	162.37	44.91	-50.33	114.84	67.06	47.78	2.404			
11,300.00	11,126.68	11,258.71	11,232.89	21.87	28.94	173.51	107.16	-64.13	166.62	121.40	45.22	3.685			
11,400.00	11,154.67	11,404.88	11,329.78	22.26	29.07	179.82	213.91	-84.60	210.18	168.27	41.90	5.016			
11,500.00	11,166.33	11,584.30	11,398.71	22.74	29.44	-175.14	377.67	-100.37	239.07	199.91	39.16	6.105			
11,600.00	11,169.52	11,738.45	11,409.34	23.29	29.94	-172.77	530.96	-103.93	241.74	202.23	39.52	6.117			
11,700.00	11,170.81	11,838.34	11,408.47	23.93	30.34	-171.78	630.85	-104.63	240.13	200.16	39.97	6.007			
11,731.56	11,170.70	11,869.89	11,408.20	24.15	30.48	-171.58	662.40	-104.85	240.09	199.97	40.12	5.984			
11,800.00	11,170.08	11,938.31	11,407.60	24.63	30.81	-171.23	730.81	-105.33	240.34	199.88	40.45	5.941			
11,900.00	11,168.76	12,038.31	11,406.74	25.39	31.33	-171.15	830.80	-106.03	240.85	199.90	40.95	5.882			
12,000.00	11,167.38	12,138.30	11,405.87	26.22	31.91	-171.27	930.79	-106.73	241.29	199.81	41.48	5.818			
12,100.00	11,166.10	12,238.30	11,405.00	27.09	32.55	-171.33	1,030.79	-107.43	241.67	199.60	42.07	5.745			
12,200.00	11,164.16	12,338.30	11,404.13	28.02	33.24	-171.30	1,130.77	-108.14	242.78	200.06	42.72	5.683			
12,297.72	11,162.71	12,436.00	11,403.28	28.96	33.95	-171.69	1,228.48	-108.82	243.14	199.79	43.36	5.608			
12,300.00	11,163.16	12,438.27	11,403.26	28.98	33.97	-171.79	1,230.74	-108.84	242.61	199.25	43.36	5.595			
12,400.00	11,160.99	12,538.23	11,402.39	29.99	34.75	-172.45	1,330.69	-109.54	243.53	199.51	44.02	5.533			
12,500.00	11,158.27	12,638.17	11,401.53	31.03	35.57	-173.13	1,430.63	-110.24	245.03	200.32	44.72	5.480			
12,600.00	11,155.45	12,738.12	11,400.66	32.11	36.43	-173.76	1,530.58	-110.94	246.68	201.22	45.46	5.426			
12,700.00	11,152.55	12,838.09	11,399.79	33.21	37.32	-174.20	1,630.53	-111.64	248.52	202.25	46.27	5.371			
12,800.00	11,149.73	12,938.06	11,398.92	34.34	38.25	-174.50	1,730.50	-112.34	250.35	203.22	47.13	5.312			
12,900.00	11,147.73	13,038.05	11,398.05	35.49	39.21	-174.59	1,830.49	-113.04	251.46	203.40	48.05	5.233			
13,000.00	11,146.16	13,138.05	11,397.18	36.66	40.20	-174.49	1,930.48	-113.74	252.20	203.17	49.03	5.144			
13,100.00	11,143.37	13,238.02	11,396.32	37.84	41.22	-174.15	2,030.44	-114.44	254.28	204.21	50.07	5.078			
13,200.00	11,141.36	13,338.00	11,395.45	39.04	42.26	-173.98	2,130.42	-115.14	255.50	204.38	51.12	4.998			
13,300.00	11,140.35	13,438.00	11,394.58	40.27	43.32	-174.05	2,230.41	-115.84	255.62	203.44	52.17	4.899			
13,400.00	11,139.55	13,538.00	11,393.71	41.50	44.41	-174.02	2,330.40	-116.54	255.56	202.30	53.27	4.798			
13,500.00	11,139.16	13,638.00	11,392.84	42.75	45.52	-173.82	2,430.39	-117.24	255.17	200.76	54.41	4.690			
13,537.28	11,138.94	13,675.27	11,392.52	43.22	45.93	-173.76	2,467.67	-117.50	255.09	200.25	54.84	4.651			
13,600.00	11,138.10	13,737.99	11,391.97	44.01	46.64	-173.79	2,530.38	-117.94	255.39	199.84	55.55	4.597			
13,700.00	11,136.36	13,837.99	11,391.10	45.28	47.78	-173.80	2,630.37	-118.64	256.26	199.55	56.70	4.519			
13,800.00	11,134.44	13,937.98	11,390.24	46.56	48.94	-173.57	2,730.36	-119.34	257.43	199.50	57.92	4.444			
13,900.00	11,131.99	14,037.96	11,389.37	47.85	50.11	-173.63	2,830.34	-120.05	258.98	199.88	59.11	4.382			
14,000.00	11,129.35	14,137.95	11,388.50	49.15	51.30	-173.68	2,930.31	-120.75	260.74	200.43	60.31	4.323			
14,100.00	11,127.30	14,237.94	11,387.63	50.46	52.50	-173.56	3,030.30	-121.45	262.00	200.43	61.57	4.255			
14,200.00	11,125.53	14,337.93	11,386.76	51.78	53.71	-173.74	3,130.28	-122.15	262.81	200.04	62.78	4.187			
14,300.00	11,123.66	14,437.92	11,385.89	53.10	54.93	-173.67	3,230.27	-122.85	263.85	199.80	64.05	4.119			
14,400.00	11,121.94	14,537.91	11,385.03	54.42	56.17	-173.35	3,330.25	-123.55	264.88	199.47	65.41	4.050			
14,500.00	11,120.47	14,637.88	11,384.16	55.75	57.41	-172.94	3,430.22	-124.25	265.71	198.91	66.80	3.977			
14,600.00	11,118.28	14,737.87	11,383.29	57.09	58.66	-172.77	3,530.20	-124.95	267.14	198.98	68.16	3.919			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 404H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 10928-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		
14,700.00	11,115.63	14,837.85	11,382.42	58.43	59.92	-172.65	3,630.17	-125.65	269.01	199.50	69.52	3.870		
14,800.00	11,113.90	14,937.84	11,381.55	59.78	61.19	-172.52	3,730.16	-126.35	269.96	199.06	70.89	3.808		
14,803.06	11,113.88	14,940.90	11,381.52	59.82	61.23	-172.52	3,733.22	-126.37	269.96	199.02	70.93	3.806		
14,900.00	11,112.44	15,037.84	11,380.68	61.13	62.47	-172.59	3,830.15	-127.05	270.51	198.30	72.22	3.746		
15,000.00	11,107.78	15,137.74	11,379.82	62.49	63.75	-173.13	3,930.04	-127.75	274.01	200.62	73.40	3.733		
15,100.00	11,100.29	15,237.47	11,378.95	63.86	65.04	-173.88	4,029.77	-128.45	280.27	205.74	74.53	3.761		
15,200.00	11,093.78	15,337.28	11,378.08	65.23	66.34	-174.43	4,129.58	-129.15	285.67	209.93	75.73	3.772		
15,300.00	11,090.64	15,437.25	11,377.21	66.60	67.64	-174.68	4,229.53	-129.85	287.82	210.79	77.04	3.736		
15,400.00	11,088.46	15,537.24	11,376.35	67.97	68.95	-174.72	4,329.52	-130.55	289.12	210.72	78.40	3.688		
15,500.00	11,085.18	15,637.20	11,375.48	69.34	70.26	-174.52	4,429.47	-131.25	291.64	211.80	79.83	3.653		
15,600.00	11,082.81	15,737.19	11,374.61	70.72	71.58	-174.51	4,529.45	-131.95	293.15	211.92	81.23	3.609		
15,700.00	11,080.37	15,837.17	11,373.74	72.10	72.91	-174.60	4,629.43	-132.65	294.68	212.09	82.60	3.568		
15,800.00	11,077.84	15,937.16	11,372.87	73.48	74.23	-174.50	4,729.41	-133.35	296.40	212.37	84.03	3.527		
15,859.00	11,076.45	15,993.77	11,372.38	74.30	74.99	-174.39	4,786.02	-133.75	297.35	212.52	84.83	3.505		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design: Black & Tan 27 Federal Com - 405H - OH - Plan 1 09-05-17													Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 10943-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)	
0.00	0.00	0.00	0.00	0.00	0.00	89.51	0.34	39.68	39.68					
100.00	100.00	100.00	100.00	0.14	0.10	-95.75	0.34	39.68	39.68	39.44	0.23 168.861			
200.00	200.00	200.00	200.00	0.40	0.36	-104.91	0.34	39.68	39.75	38.99	0.76 52.309			
300.00	300.00	300.00	300.00	0.66	0.63	-98.07	0.34	39.68	39.80	38.52	1.29 30.887			
400.00	400.00	400.00	400.00	0.91	0.89	-127.96	0.34	39.68	39.88	38.07	1.81 22.049			
500.00	500.00	500.00	500.00	1.16	1.16	-117.60	0.34	39.68	40.08	37.76	2.32 17.281			
600.00	600.00	600.00	600.00	1.42	1.43	-103.78	0.34	39.68	40.18	37.34	2.84 14.140			
700.00	700.00	700.00	700.00	1.68	1.69	-108.41	0.34	39.68	40.26	36.89	3.37 11.938			
800.00	800.00	800.00	800.00	1.95	1.96	-107.03	0.34	39.68	40.39	36.48	3.90 10.348			
900.00	900.00	900.00	900.00	2.21	2.22	-121.00	0.34	39.68	40.49	36.06	4.43 9.137			
1,000.00	1,000.00	1,000.00	1,000.00	2.47	2.49	-119.37	0.34	39.68	40.65	35.69	4.96 8.195			
1,100.00	1,100.00	1,100.00	1,100.00	2.73	2.75	-141.90	0.34	39.68	40.76	35.28	5.48 7.438			
1,200.00	1,200.00	1,200.00	1,200.00	2.98	3.02	-128.98	0.34	39.68	40.87	34.87	6.00 6.812			
1,300.00	1,299.99	1,299.99	1,299.99	3.24	3.28	-130.16	0.34	39.68	41.00	34.47	6.53 6.282			
1,400.00	1,399.99	1,399.99	1,399.99	3.50	3.55	-133.42	0.34	39.68	41.19	34.14	7.05 5.840			
1,500.00	1,499.99	1,499.99	1,499.99	3.77	3.81	-133.22	0.34	39.68	41.42	33.84	7.58 5.465			
1,600.00	1,599.99	1,599.99	1,599.99	4.02	4.08	-138.98	0.34	39.68	41.67	33.56	8.10 5.141			
1,700.00	1,699.99	1,699.99	1,699.99	4.24	4.35	176.24	0.34	39.68	41.87	33.28	8.59 4.875			
1,800.00	1,799.99	1,799.99	1,799.99	4.32	4.61	71.41	0.34	39.68	41.82	32.89	8.93 4.684			
1,900.00	1,899.99	1,899.99	1,899.99	4.31	4.88	62.26	0.34	39.68	41.60	32.41	9.19 4.528			
2,000.00	1,999.99	1,999.99	1,999.99	4.32	5.14	64.50	0.34	39.68	41.35	31.89	9.46 4.371			
2,100.00	2,099.99	2,099.99	2,099.99	4.34	5.41	66.57	0.34	39.68	41.12	31.37	9.75 4.217			
2,200.00	2,199.99	2,199.99	2,199.99	4.38	5.67	55.69	0.34	39.68	40.85	30.79	10.06 4.062			
2,300.00	2,299.99	2,299.99	2,299.99	4.45	5.94	18.18	0.34	39.68	40.56	30.17	10.39 3.903			
2,400.00	2,399.98	2,399.98	2,399.98	4.57	6.20	-17.96	0.34	39.68	40.26	29.49	10.78 3.737			
2,500.00	2,499.98	2,499.98	2,499.98	4.71	6.47	7.85	0.34	39.68	39.86	28.68	11.18 3.566			
2,600.00	2,599.98	2,599.98	2,599.98	4.83	6.73	9.20	0.34	39.68	39.27	27.70	11.57 3.395			
2,700.00	2,699.98	2,699.98	2,699.98	4.96	7.00	16.43	0.34	39.68	38.44	26.48	11.96 3.214			
2,800.00	2,799.97	2,799.97	2,799.97	5.11	7.27	6.64	0.34	39.68	37.27	24.90	12.37 3.013			
2,900.00	2,899.96	2,899.96	2,899.96	5.26	7.53	13.75	0.34	39.68	35.92	23.13	12.79 2.808			
3,000.00	2,999.95	2,999.95	2,999.95	5.43	7.80	3.17	0.34	39.68	34.26	21.04	13.22 2.591			
3,100.00	3,099.94	3,099.94	3,099.94	5.62	8.06	-57.39	0.34	39.68	33.18	19.50	13.68 2.425			
3,140.36	3,140.30	3,140.30	3,140.30	5.69	8.17	-90.00	0.34	39.68	33.10	19.24	13.86 2.388 CC			
3,200.00	3,199.94	3,199.94	3,199.94	5.80	8.33	164.49	0.34	39.68	33.43	19.31	14.12 2.367			
3,300.00	3,299.94	3,299.94	3,299.94	5.92	8.59	108.03	0.34	39.68	33.85	19.34	14.52 2.332			
3,400.00	3,399.93	3,399.93	3,399.93	6.04	8.86	89.16	0.34	39.68	33.93	19.03	14.90 2.277			
3,500.00	3,499.93	3,499.93	3,499.93	6.17	9.12	84.39	0.34	39.68	33.90	18.61	15.29 2.217			
3,568.90	3,568.83	3,568.83	3,568.83	6.26	9.31	104.36	0.34	39.68	33.93	18.36	15.57 2.180			
3,600.00	3,599.93	3,599.93	3,599.93	6.30	9.39	115.00	0.34	39.68	33.88	18.19	15.69 2.159 ES			
3,700.00	3,699.93	3,699.93	3,699.93	6.45	9.65	165.16	0.34	39.68	34.38	18.27	16.11 2.134			
3,800.00	3,799.92	3,799.92	3,799.92	6.62	9.92	179.18	0.34	39.68	35.03	18.49	16.54 2.118			
3,900.00	3,899.92	3,899.92	3,899.92	6.79	10.18	-174.14	0.34	39.68	35.90	18.92	16.98 2.115			
4,000.00	3,999.92	3,999.92	3,999.92	6.97	10.45	169.75	0.34	39.68	36.87	19.45	17.42 2.116			
4,100.00	4,099.91	4,099.91	4,099.91	7.15	10.72	166.24	0.34	39.68	37.81	19.95	17.87 2.116			
4,200.00	4,199.90	4,199.90	4,199.90	7.34	10.98	175.89	0.34	39.68	38.95	20.63	18.32 2.126			
4,300.00	4,299.90	4,299.90	4,299.90	7.53	11.25	-69.69	0.34	39.68	39.48	20.71	18.77 2.103			
4,325.63	4,325.53	4,325.53	4,325.53	7.57	11.31	-90.00	0.34	39.68	39.43	20.54	18.89 2.088			
4,400.00	4,399.90	4,399.90	4,399.90	7.71	11.51	156.33	0.34	39.68	39.72	20.50	19.22 2.066			
4,500.00	4,499.89	4,499.89	4,499.89	7.89	11.78	148.75	0.34	39.68	40.71	21.04	19.67 2.070			
4,600.00	4,599.89	4,599.89	4,599.89	8.08	12.04	153.06	0.34	39.68	41.60	21.48	20.12 2.067			
4,700.00	4,699.88	4,699.88	4,699.88	8.27	12.31	145.95	0.34	39.68	42.47	21.89	20.58 2.064			
4,800.00	4,799.88	4,799.88	4,799.88	8.45	12.57	-109.49	0.34	39.68	42.77	21.75	21.03 2.034			

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

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 405H - OH - Plan 1 09-05-17													Offset Site Error:
Survey Program: 0-NS-GYRO-MS, 10943-MWD+HDGM													Offset Well Error:
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	
4,900.00	4,899.87	4,899.87	4,899.87	8.65	12.84	148.99	0.34	39.68	43.46	21.98	21.49	2.023	
5,000.00	4,999.87	4,999.87	4,999.87	8.84	13.10	146.37	0.34	39.68	44.37	22.42	21.94	2.022	
5,100.00	5,099.86	5,099.86	5,099.86	9.03	13.37	146.72	0.34	39.68	45.17	22.77	22.40	2.016	
5,200.00	5,199.86	5,199.86	5,199.86	9.23	13.64	134.14	0.34	39.68	46.02	23.15	22.87	2.013	
5,300.00	5,299.85	5,299.85	5,299.85	9.42	13.90	143.17	0.34	39.68	46.75	23.43	23.33	2.004	
5,400.00	5,399.85	5,399.85	5,399.85	9.63	14.17	164.00	0.34	39.68	47.66	23.86	23.80	2.003	
5,500.00	5,499.85	5,499.85	5,499.85	9.85	14.43	-169.35	0.34	39.68	48.11	23.83	24.28	1.982	
5,600.00	5,599.85	5,599.85	5,599.85	10.03	14.70	-30.83	0.34	39.68	48.17	23.44	24.73	1.948	
5,700.00	5,699.84	5,699.84	5,699.84	10.19	14.96	-85.05	0.34	39.68	47.90	22.75	25.15	1.904	
5,740.19	5,740.04	5,740.04	5,740.04	10.27	15.07	-90.00	0.34	39.68	47.90	22.56	25.33	1.891	
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	-97.15	0.34	39.68	47.96	22.35	25.60	1.873	
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	-97.15	0.34	39.68	47.96	22.35	25.60	1.873	
5,900.00	5,899.84	5,899.84	5,899.84	10.56	15.48	-96.17	0.34	39.72	48.04	22.00	26.04	1.845 SF	
6,000.00	5,999.83	5,999.83	5,999.83	10.76	15.59	-103.33	0.32	40.91	49.58	23.23	26.34	1.882	
6,100.00	6,099.75	6,099.75	6,099.75	10.96	15.71	-109.19	0.27	43.82	53.60	26.95	26.65	2.012	
6,200.00	6,199.65	6,199.65	6,199.65	11.16	15.83	-115.92	0.19	48.42	60.00	33.05	26.95	2.226	
6,300.00	6,299.55	6,299.55	6,299.55	11.37	15.95	-117.95	0.08	54.70	68.36	41.11	27.25	2.508	
6,400.00	6,399.46	6,399.46	6,399.46	11.58	16.08	-121.16	-0.06	62.65	78.50	50.95	27.55	2.850	
6,500.00	6,499.38	6,499.38	6,499.38	11.79	16.21	-121.40	-0.23	72.24	90.17	62.32	27.85	3.237	
6,600.00	6,599.32	6,599.32	6,599.32	12.01	16.34	-120.22	-0.41	82.62	102.24	74.04	28.20	3.626	
6,700.00	6,699.26	6,699.26	6,699.26	12.22	16.48	-118.51	-0.59	93.00	114.08	85.53	28.55	3.996	
6,800.00	6,799.17	6,799.17	6,799.17	12.44	16.62	-123.56	-0.77	103.37	126.46	97.55	28.90	4.375	
6,900.00	6,899.07	6,899.07	6,899.07	12.66	16.77	-124.78	-0.95	113.73	139.25	109.98	29.27	4.758	
7,000.00	6,998.97	6,998.97	6,998.97	12.88	16.92	-127.26	-1.13	124.09	151.98	122.35	29.63	5.128	
7,100.00	7,098.86	7,098.86	7,098.86	13.11	17.07	-131.95	-1.31	134.46	165.06	135.05	30.01	5.500	
7,200.00	7,198.77	7,198.77	7,198.77	13.34	17.22	-129.22	-1.50	144.82	178.06	147.67	30.39	5.860	
7,300.00	7,298.67	7,298.67	7,298.67	13.56	17.38	-117.21	-1.68	155.19	190.62	159.86	30.77	6.196	
7,400.00	7,398.55	7,398.55	7,398.55	13.78	17.54	-117.40	-1.86	165.56	202.88	171.74	31.15	6.514	
7,500.00	7,498.44	7,498.44	7,498.44	14.01	17.70	-131.03	-2.04	175.92	215.57	184.04	31.53	6.837	
7,600.00	7,598.30	7,598.30	7,598.30	14.25	17.87	-129.62	-2.22	186.28	229.16	197.23	31.93	7.178	
7,700.00	7,698.13	7,698.13	7,698.13	14.48	18.04	-133.52	-2.40	196.63	243.04	210.71	32.32	7.519	
7,800.00	7,797.98	7,797.98	7,797.98	14.72	18.21	-133.31	-2.58	206.98	256.86	224.13	32.73	7.849	
7,900.00	7,897.86	7,897.86	7,897.86	14.96	18.38	-132.09	-2.76	217.33	270.22	237.09	33.13	8.156	
8,000.00	7,997.77	7,997.77	7,997.77	15.19	18.56	-130.62	-2.94	227.70	282.89	249.35	33.54	8.435	
8,100.00	8,097.70	8,097.70	8,097.70	15.43	18.74	-133.02	-3.12	238.07	295.42	261.47	33.95	8.702	
8,200.00	8,197.64	8,197.64	8,197.64	15.67	18.92	-129.30	-3.30	248.44	307.87	273.50	34.36	8.959	
8,300.00	8,297.56	8,297.56	8,297.56	15.91	19.10	-121.92	-3.49	258.81	320.11	285.33	34.78	9.205	
8,400.00	8,397.45	8,397.45	8,397.45	16.15	19.29	-119.28	-3.67	269.18	332.52	297.33	35.19	9.449	
8,500.00	8,497.32	8,497.32	8,497.32	16.38	19.48	-118.20	-3.85	279.55	345.00	309.40	35.61	9.689	
8,600.00	8,597.19	8,597.19	8,597.19	16.62	19.67	-116.71	-4.03	289.92	357.35	321.32	36.03	9.919	
8,700.00	8,697.07	8,697.07	8,697.07	16.85	19.86	-114.27	-4.21	300.29	369.49	333.04	36.45	10.138	
8,800.00	8,796.96	8,796.96	8,796.96	17.09	20.05	-116.67	-4.39	310.67	381.41	344.54	36.87	10.345	
8,900.00	8,896.87	8,896.87	8,896.87	17.33	20.25	-129.97	-4.57	321.04	393.57	356.27	37.30	10.552	
9,000.00	8,996.80	8,996.80	8,996.80	17.57	20.45	-125.16	-4.75	331.41	405.81	368.08	37.73	10.755	
9,100.00	9,096.75	9,096.75	9,096.75	17.82	20.65	-143.85	-4.93	341.79	417.98	379.81	38.17	10.951	
9,200.00	9,196.70	9,196.70	9,196.70	18.06	20.85	-173.03	-5.11	352.15	430.80	392.19	38.60	11.160	
9,300.00	9,296.64	9,296.64	9,296.64	18.30	21.05	-164.19	-5.30	362.51	444.12	405.08	39.04	11.377	
9,400.00	9,396.58	9,396.58	9,396.58	18.54	21.26	-144.98	-5.48	372.86	457.36	417.88	39.48	11.585	
9,500.00	9,496.53	9,496.53	9,496.53	18.79	21.46	-139.31	-5.66	383.23	469.80	429.88	39.92	11.768	
9,600.00	9,596.47	9,596.47	9,596.47	19.03	21.67	-114.43	-5.84	393.61	481.72	441.35	40.37	11.934	
9,700.00	9,696.39	9,696.39	9,696.39	19.27	21.88	-114.37	-6.02	403.99	493.30	452.49	40.81	12.089	
9,800.00	9,796.32	9,796.32	9,796.32	19.51	22.09	-114.82	-6.20	414.37	504.89	463.65	41.25	12.240	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10943-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)					
9,900.00	9,896.23	9,864.12	9,844.48	19.75	22.30	-116.78	-6.38	424.75	516.76	475.07	41.69	12.394	
10,000.00	9,996.15	9,963.40	9,943.22	20.00	22.52	-119.81	-6.56	435.12	528.67	486.52	42.14	12.544	
10,100.00	10,096.08	10,062.67	10,041.95	20.25	22.73	-133.89	-6.74	445.50	540.77	498.17	42.60	12.695	
10,200.00	10,196.03	10,161.87	10,140.60	20.49	22.95	-162.75	-6.92	455.87	553.31	510.26	43.05	12.853	
10,300.00	10,296.00	10,261.04	10,239.23	20.71	23.17	159.42	-7.11	466.23	565.79	522.31	43.48	13.013	
10,400.00	10,395.97	10,360.25	10,337.90	20.89	23.39	126.50	-7.29	476.60	577.57	533.71	43.86	13.169	
10,500.00	10,495.95	10,459.55	10,436.65	21.01	23.61	104.12	-7.47	486.98	588.47	544.27	44.20	13.314	
10,600.00	10,595.94	10,558.89	10,535.45	21.08	23.83	120.06	-7.65	497.36	599.07	554.52	44.55	13.448	
10,700.00	10,695.63	10,657.87	10,633.88	21.11	24.05	81.84	-7.83	507.70	609.17	564.35	44.82	13.592	
10,800.00	10,791.50	10,753.15	10,728.64	21.12	24.26	74.97	-8.00	517.66	613.41	568.37	45.04	13.620	
10,805.82	10,796.87	10,758.50	10,733.97	21.13	24.28	75.36	-8.01	518.22	613.44	568.38	45.05	13.616	
10,900.00	10,880.02	10,841.34	10,816.35	21.16	24.46	81.09	-8.16	526.88	613.67	568.41	45.27	13.556	
11,000.00	10,958.70	10,919.45	10,894.03	21.24	24.62	86.04	-8.31	535.04	618.81	573.32	45.49	13.602	
11,100.00	11,026.51	10,989.38	10,963.63	21.37	24.65	88.18	-7.78	540.70	630.67	585.02	45.65	13.814	
11,200.00	11,083.86	11,008.88	10,982.49	21.58	24.65	89.28	-4.73	547.04	653.47	607.62	45.85	14.252	
11,300.00	11,126.68	11,045.80	11,018.24	21.87	24.65	88.59	0.51	554.62	687.15	641.00	46.15	14.890	
11,400.00	11,154.67	11,080.40	11,051.03	22.26	24.66	86.52	7.47	563.13	728.76	682.26	46.50	15.671	
11,500.00	11,166.33	11,111.91	11,080.16	22.74	24.67	83.88	15.52	572.03	775.45	728.58	46.87	16.543	
11,600.00	11,169.52	11,146.19	11,110.90	23.29	24.68	86.24	26.06	582.91	829.12	781.90	47.22	17.559	
11,700.00	11,170.81	11,913.18	11,408.25	23.93	26.35	105.98	636.93	759.43	863.09	813.65	49.44	17.457	
11,800.00	11,170.08	12,013.15	11,407.37	24.63	26.85	106.02	736.90	758.72	860.82	810.22	50.59	17.014	
11,874.36	11,169.14	12,087.51	11,406.72	25.20	27.27	106.03	811.25	758.20	860.23	808.70	51.54	16.691	
11,900.00	11,168.76	12,113.15	11,406.50	25.39	27.42	106.04	836.89	758.02	860.49	808.62	51.87	16.589	
12,000.00	11,167.38	12,213.15	11,405.62	26.22	28.06	106.06	936.88	757.32	861.08	807.81	53.27	16.165	
12,100.00	11,166.10	12,313.14	11,404.75	27.09	28.75	106.09	1,036.87	756.62	861.36	806.59	54.77	15.726	
12,167.85	11,165.04	12,381.00	11,404.16	27.72	29.26	106.11	1,104.72	756.14	861.55	805.70	55.85	15.425	
12,200.00	11,164.16	12,413.14	11,403.87	28.02	29.51	106.15	1,136.86	755.91	861.36	804.99	56.37	15.281	
12,300.00	11,163.16	12,513.11	11,403.00	28.98	30.31	106.12	1,236.83	755.21	863.36	805.29	58.07	14.867	
12,400.00	11,160.99	12,613.07	11,402.13	29.99	31.16	106.13	1,336.78	754.51	866.26	806.41	59.85	14.474	
12,500.00	11,158.27	12,713.02	11,401.25	31.03	32.05	106.19	1,436.72	753.81	869.34	807.65	61.70	14.091	
12,600.00	11,155.45	12,812.97	11,400.38	32.11	32.98	106.28	1,536.66	753.10	872.29	808.67	63.61	13.713	
12,700.00	11,152.55	12,912.93	11,399.50	33.21	33.95	106.38	1,636.62	752.40	874.52	808.94	65.59	13.334	
12,800.00	11,149.73	13,012.91	11,398.63	34.34	34.95	106.49	1,736.59	751.70	876.14	808.53	67.61	12.958	
12,900.00	11,147.73	13,112.90	11,397.76	35.49	35.99	106.57	1,836.57	751.00	876.76	807.06	69.70	12.579	
13,000.00	11,146.16	13,212.89	11,396.88	36.66	37.04	106.64	1,936.56	750.29	876.48	804.65	71.83	12.202	
13,100.00	11,143.37	13,312.86	11,396.01	37.84	38.13	106.80	2,036.52	749.59	875.41	801.43	73.99	11.832	
13,183.49	11,141.64	13,396.34	11,395.28	38.84	39.05	106.85	2,120.00	749.01	874.94	799.11	75.82	11.539	
13,200.00	11,141.36	13,412.84	11,395.13	39.04	39.24	106.86	2,136.50	748.89	874.88	798.69	76.19	11.483	
13,300.00	11,140.35	13,512.84	11,394.26	40.27	40.37	106.86	2,236.49	748.19	875.19	796.74	78.45	11.156	
13,400.00	11,139.55	13,612.84	11,393.38	41.50	41.52	106.87	2,336.49	747.48	875.05	794.29	80.75	10.836	
13,500.00	11,139.16	13,712.84	11,392.51	42.75	42.68	106.85	2,436.48	746.78	874.11	791.02	83.08	10.521	
13,568.71	11,138.63	13,781.55	11,391.91	43.61	43.50	106.85	2,505.18	746.30	873.73	789.03	84.70	10.316	
13,600.00	11,138.10	13,812.84	11,391.64	44.01	43.87	106.86	2,536.47	746.08	873.99	788.55	85.43	10.230	
13,700.00	11,136.36	13,912.83	11,390.76	45.28	45.07	106.92	2,636.46	745.38	874.21	786.41	87.80	9.957	
13,800.00	11,134.44	14,012.82	11,389.89	46.56	46.28	107.02	2,736.44	744.67	873.42	783.24	90.18	9.685	
13,837.09	11,133.62	14,049.91	11,389.56	47.04	46.74	107.05	2,773.53	744.41	873.31	782.25	91.07	9.590	
13,900.00	11,131.99	14,112.81	11,389.01	47.85	47.51	107.09	2,836.42	743.97	873.96	781.38	92.58	9.440	
14,000.00	11,129.35	14,212.79	11,388.14	49.15	48.75	107.22	2,936.40	743.27	874.53	779.54	94.99	9.206	
14,090.14	11,127.41	14,302.92	11,387.35	50.33	49.87	107.29	3,026.52	742.63	874.65	777.46	97.19	9.000	
14,100.00	11,127.30	14,312.78	11,387.26	50.46	49.99	107.30	3,036.38	742.57	874.22	776.79	97.43	8.973	
14,200.00	11,125.53	14,412.77	11,386.39	51.78	51.25	107.34	3,136.37	741.86	875.17	775.27	99.89	8.761	
14,300.00	11,123.66	14,512.77	11,385.52	53.10	52.52	107.42	3,236.35	741.16	875.07	772.71	102.37	8.548	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 405H - OH - Plan 1 09-05-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10943-MWD+HDGM														
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)		+N/-S (usft)	+E/-W (usft)						
14,400.00	11,121.94	14,612.75	11,384.64	54.42	53.80	107.52	3,336.33	740.46	873.81	768.96	104.85	8.334		
14,500.00	11,120.47	14,712.73	11,383.77	55.75	55.09	107.59	3,436.30	739.75	872.11	764.77	107.34	8.125		
14,600.00	11,118.28	14,812.71	11,382.89	57.09	56.38	107.69	3,536.28	739.05	871.57	761.74	109.83	7.935		
14,700.00	11,115.63	14,912.70	11,382.02	58.43	57.68	107.81	3,636.26	738.35	871.35	759.02	112.33	7.757		
14,800.00	11,113.90	15,012.69	11,381.14	59.78	58.99	107.87	3,736.24	737.65	870.91	756.05	114.86	7.583		
14,827.11	11,113.63	15,039.80	11,380.91	60.14	59.35	107.88	3,763.35	737.46	870.82	755.26	115.55	7.536		
14,900.00	11,112.44	15,112.68	11,380.27	61.13	60.31	107.88	3,836.23	736.94	871.29	753.88	117.41	7.421		
15,000.00	11,107.78	15,212.58	11,379.40	62.49	61.62	107.97	3,936.12	736.24	874.47	754.56	119.91	7.293		
15,100.00	11,100.29	15,312.32	11,378.52	63.86	62.95	108.29	4,035.85	735.54	879.31	756.98	122.33	7.188		
15,200.00	11,093.78	15,412.13	11,377.65	65.23	64.28	108.70	4,135.66	734.84	883.13	758.35	124.78	7.077		
15,300.00	11,090.64	15,512.09	11,376.78	66.60	65.61	108.86	4,235.62	734.14	884.84	757.52	127.32	6.950		
15,400.00	11,088.46	15,612.08	11,375.90	67.97	66.95	108.95	4,335.60	733.44	885.38	755.50	129.88	6.817		
15,500.00	11,085.18	15,712.05	11,375.03	69.34	68.29	109.14	4,435.56	732.73	884.99	752.59	132.40	6.684		
15,534.12	11,084.14	15,746.16	11,374.73	69.81	68.75	109.18	4,469.67	732.49	884.92	751.66	133.26	6.641		
15,600.00	11,082.81	15,812.03	11,374.15	70.72	69.64	109.21	4,535.54	732.03	885.29	750.33	134.96	6.560		
15,700.00	11,080.37	15,912.02	11,373.28	72.10	71.00	109.30	4,635.52	731.33	886.10	748.57	137.53	6.443		
15,800.00	11,077.84	16,012.00	11,372.41	73.48	72.35	109.43	4,735.50	730.63	886.03	745.94	140.09	6.325		
15,859.00	11,076.45	16,070.58	11,371.89	74.30	73.16	109.50	4,794.07	730.21	885.69	744.11	141.59	6.255		

Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Black & Tan 27 Federal Com - 503H - OH - Plan 1 09-05-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11242-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)						
0.00	0.00	0.00	0.00	0.00	0.00	-36.67	54.75	-40.77	68.26					
100.00	100.00	100.00	100.00	0.14	0.10	138.26	54.75	-40.77	68.35	68.11	0.23	290.874		
200.00	200.00	200.00	200.00	0.40	0.36	129.58	54.75	-40.77	68.49	67.73	0.76	90.130		
300.00	300.00	300.00	300.00	0.66	0.63	137.19	54.75	-40.77	68.76	67.47	1.29	53.358		
400.00	400.00	400.00	400.00	0.91	0.89	107.84	54.75	-40.77	68.93	67.12	1.81	38.113		
500.00	500.00	500.00	500.00	1.16	1.16	118.71	54.75	-40.77	68.99	66.67	2.32	29.747		
600.00	600.00	600.00	600.00	1.42	1.43	133.30	54.75	-40.77	69.23	66.39	2.84	24.361		
700.00	700.00	700.00	700.00	1.68	1.69	129.20	54.75	-40.77	69.41	66.04	3.37	20.584		
800.00	800.00	800.00	800.00	1.95	1.96	131.39	54.75	-40.77	69.67	65.77	3.90	17.851		
900.00	900.00	900.00	900.00	2.21	2.22	117.96	54.75	-40.77	69.84	65.40	4.43	15.758		
1,000.00	1,000.00	1,000.00	1,000.00	2.47	2.49	120.16	54.75	-40.77	69.97	65.01	4.96	14.106		
1,100.00	1,100.00	1,100.00	1,100.00	2.73	2.75	98.01	54.75	-40.77	70.05	64.57	5.48	12.782		
1,200.00	1,200.00	1,200.00	1,200.00	2.98	3.02	111.20	54.75	-40.77	70.09	64.09	6.00	11.683		
1,300.00	1,299.99	1,299.99	1,299.99	3.24	3.28	110.40	54.75	-40.77	70.16	63.64	6.53	10.750		
1,400.00	1,399.99	1,399.99	1,399.99	3.50	3.55	107.65	54.75	-40.77	70.25	63.20	7.05	9.961		
1,500.00	1,499.99	1,499.99	1,499.99	3.77	3.81	108.46	54.75	-40.77	70.36	62.79	7.58	9.283		
1,600.00	1,599.99	1,599.99	1,599.99	4.02	4.08	103.27	54.75	-40.77	70.45	62.34	8.10	8.692		
1,700.00	1,699.99	1,699.99	1,699.99	4.24	4.35	58.94	54.75	-40.77	70.51	61.92	8.59	8.210		
1,800.00	1,799.99	1,799.99	1,799.99	4.32	4.61	-46.47	54.75	-40.77	70.26	61.33	8.93	7.869		
1,900.00	1,899.99	1,899.99	1,899.99	4.31	4.88	-56.65	54.75	-40.77	69.93	60.74	9.19	7.611		
2,000.00	1,999.99	1,999.99	1,999.99	4.32	5.14	-55.37	54.75	-40.77	69.66	60.20	9.46	7.364		
2,100.00	2,099.99	2,099.99	2,099.99	4.34	5.41	-54.48	54.75	-40.77	69.30	59.55	9.75	7.107		
2,200.00	2,199.99	2,199.99	2,199.99	4.38	5.67	-66.54	54.75	-40.77	68.98	58.93	10.06	6.860		
2,272.39	2,272.38	2,272.38	2,272.38	4.43	5.86	-90.00	54.75	-40.77	68.91	58.61	10.30	6.691		
2,300.00	2,299.99	2,299.99	2,299.99	4.45	5.94	-104.72	54.75	-40.77	68.92	58.53	10.39	6.632		
2,400.00	2,399.98	2,399.98	2,399.98	4.57	6.20	-141.02	54.75	-40.77	69.11	58.33	10.78	6.413		
2,500.00	2,499.98	2,499.98	2,499.98	4.71	6.47	-115.37	54.75	-40.77	69.38	58.20	11.18	6.208		
2,600.00	2,599.98	2,599.98	2,599.98	4.83	6.73	-114.64	54.75	-40.77	69.61	58.05	11.57	6.019		
2,700.00	2,699.98	2,699.98	2,699.98	4.96	7.00	-108.33	54.75	-40.77	69.92	57.96	11.96	5.845		
2,800.00	2,799.97	2,799.97	2,799.97	5.11	7.27	-119.36	54.75	-40.77	70.41	58.04	12.37	5.692		
2,900.00	2,899.96	2,899.96	2,899.96	5.26	7.53	-113.66	54.75	-40.77	71.02	58.23	12.79	5.552		
3,000.00	2,999.95	2,999.95	2,999.95	5.43	7.80	-125.83	54.75	-40.77	71.84	58.61	13.22	5.433		
3,100.00	3,099.94	3,099.94	3,099.94	5.62	8.06	173.81	54.75	-40.77	72.82	59.14	13.68	5.322		
3,200.00	3,199.94	3,199.94	3,199.94	5.80	8.33	36.38	54.75	-40.77	72.86	58.73	14.12	5.158		
3,300.00	3,299.94	3,299.94	3,299.94	5.92	8.59	-21.04	54.75	-40.77	72.16	57.65	14.52	4.971		
3,400.00	3,399.93	3,399.93	3,399.93	6.04	8.86	-41.48	54.75	-40.77	71.55	56.65	14.90	4.803		
3,500.00	3,499.93	3,499.93	3,499.93	6.17	9.12	-47.73	54.75	-40.77	71.07	55.78	15.29	4.648		
3,600.00	3,599.93	3,599.93	3,599.93	6.30	9.39	-18.48	54.75	-40.77	70.65	54.95	15.69	4.502		
3,700.00	3,699.93	3,699.93	3,699.93	6.45	9.65	31.25	54.75	-40.77	70.07	53.96	16.11	4.350		
3,800.00	3,799.92	3,799.92	3,799.92	6.62	9.92	45.55	54.75	-40.77	69.58	53.04	16.54	4.207		
3,900.00	3,899.92	3,899.92	3,899.92	6.79	10.18	52.82	54.75	-40.77	69.00	52.02	16.98	4.064		
4,000.00	3,999.92	3,999.92	3,999.92	6.97	10.45	37.36	54.75	-40.77	68.37	50.94	17.42	3.924		
4,100.00	4,099.91	4,099.91	4,099.91	7.15	10.72	33.92	54.75	-40.77	67.55	49.68	17.87	3.780		
4,200.00	4,199.90	4,199.90	4,199.90	7.34	10.98	43.90	54.75	-40.77	66.65	48.33	18.32	3.638		
4,246.71	4,246.61	4,246.61	4,246.61	7.43	11.11	90.00	54.75	-40.77	66.44	47.91	18.53	3.585		
4,300.00	4,299.90	4,299.90	4,299.90	7.53	11.25	159.47	54.75	-40.77	66.60	47.82	18.77	3.547		
4,400.00	4,399.90	4,399.90	4,399.90	7.71	11.51	26.37	54.75	-40.77	66.71	47.49	19.22	3.470		
4,500.00	4,499.89	4,499.89	4,499.89	7.89	11.78	18.41	54.75	-40.77	65.67	46.00	19.67	3.338		
4,600.00	4,599.89	4,599.89	4,599.89	8.08	12.04	22.40	54.75	-40.77	64.74	44.62	20.12	3.217		
4,700.00	4,699.88	4,699.88	4,699.88	8.27	12.31	14.63	54.75	-40.77	63.69	43.12	20.58	3.096		
4,771.99	4,771.87	4,771.87	4,771.87	8.40	12.50	91.04	54.75	-40.77	63.39	42.49	20.90	3.033		
4,800.00	4,799.88	4,799.88	4,799.88	8.45	12.57	120.16	54.75	-40.77	63.79	42.76	21.03	3.034		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11242-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		
4,900.00	4,899.87	4,899.87	4,899.87	8.65	12.84	18.91	54.75	-40.77	63.26	41.78	21.49	2.944		
5,000.00	4,999.87	4,999.87	4,999.87	8.84	13.10	15.78	54.75	-40.77	62.22	40.28	21.94	2.836		
5,100.00	5,099.86	5,099.86	5,099.86	9.03	13.37	15.73	54.75	-40.77	61.31	38.90	22.40	2.736		
5,200.00	5,199.86	5,199.86	5,199.86	9.23	13.64	2.55	54.75	-40.77	60.27	37.41	22.87	2.636		
5,300.00	5,299.85	5,299.85	5,299.85	9.42	13.90	10.52	54.75	-40.77	59.15	35.82	23.33	2.536		
5,400.00	5,399.85	5,399.85	5,399.85	9.63	14.17	31.25	54.75	-40.77	58.25	34.45	23.80	2.448		
5,500.00	5,499.85	5,499.85	5,499.85	9.85	14.43	58.13	54.75	-40.77	57.90	33.62	24.28	2.385		
5,534.69	5,534.54	5,534.54	5,534.54	9.91	14.52	90.00	54.75	-40.77	57.87	33.44	24.44	2.368		
5,600.00	5,599.85	5,599.85	5,599.85	10.03	14.70	-163.08	54.75	-40.77	57.95	33.22	24.73	2.343		
5,700.00	5,699.84	5,699.84	5,699.84	10.19	14.96	142.99	54.75	-40.77	58.32	33.17	25.15	2.319		
5,800.00	5,799.84	5,799.84	5,799.84	10.37	15.23	131.74	54.75	-40.77	58.62	33.02	25.60	2.290		
5,900.00	5,899.84	5,900.04	5,900.04	10.56	15.47	133.59	54.72	-40.74	58.89	32.86	26.03	2.262		
6,000.00	5,999.83	6,001.05	6,001.04	10.76	15.48	129.90	53.84	-39.86	58.75	32.52	26.23	2.240		
6,100.00	6,099.75	6,101.98	6,101.92	10.96	15.50	131.75	51.71	-37.73	58.35	31.92	26.43	2.207		
6,200.00	6,199.65	6,202.81	6,202.64	11.16	15.52	133.80	48.32	-34.34	56.88	30.24	26.64	2.135		
6,300.00	6,299.55	6,303.50	6,303.12	11.37	15.54	140.61	43.68	-29.71	54.23	27.38	26.85	2.019		
6,400.00	6,399.46	6,404.00	6,403.27	11.58	15.57	146.86	37.81	-23.84	50.58	23.51	27.07	1.868		
6,500.00	6,499.38	6,504.09	6,502.86	11.79	15.60	157.40	30.77	-16.79	46.34	19.02	27.32	1.696		
6,600.00	6,599.32	6,603.62	6,601.85	12.01	15.64	170.71	23.41	-9.44	42.90	15.30	27.60	1.554		
6,700.00	6,699.26	6,703.18	6,700.86	12.22	15.69	-174.55	16.06	-2.08	41.38	13.50	27.88	1.484 Level 3		
6,704.83	6,704.09	6,707.99	6,705.65	12.23	15.69	-174.17	15.70	-1.72	41.38	13.48	27.90	1.483 Level 3, CC, ES, SF		
6,800.00	6,799.17	6,802.73	6,799.87	12.44	15.74	-166.21	8.70	5.28	42.77	14.60	28.17	1.518		
6,900.00	6,899.07	6,902.26	6,898.85	12.66	15.79	-155.26	1.34	12.64	46.50	18.06	28.44	1.635		
7,000.00	6,998.97	7,001.78	6,997.83	12.88	15.85	-147.75	-6.02	19.99	51.76	23.05	28.72	1.803		
7,100.00	7,098.86	7,101.28	7,096.78	13.11	15.91	-144.26	-13.37	27.35	58.48	29.48	28.99	2.017		
7,200.00	7,198.77	7,200.76	7,195.72	13.34	15.98	-134.96	-20.72	34.70	65.93	36.66	29.27	2.252		
7,300.00	7,298.67	7,300.31	7,294.72	13.56	16.05	-118.00	-28.08	42.06	73.59	44.03	29.56	2.490		
7,400.00	7,398.55	7,399.92	7,393.78	13.78	16.12	-114.42	-35.44	49.42	81.29	51.44	29.85	2.724		
7,500.00	7,498.44	7,499.47	7,492.79	14.01	16.21	-124.75	-42.80	56.78	89.67	59.52	30.14	2.975		
7,600.00	7,598.30	7,598.95	7,591.73	14.25	16.29	-120.77	-50.15	64.13	99.10	68.64	30.45	3.254		
7,700.00	7,698.13	7,698.42	7,690.65	14.48	16.38	-122.60	-57.51	71.48	108.88	78.12	30.77	3.539		
7,800.00	7,797.98	7,797.89	7,789.57	14.72	16.47	-120.56	-64.86	78.83	118.75	87.66	31.09	3.819		
7,900.00	7,897.86	7,897.37	7,888.51	14.96	16.57	-117.66	-72.21	86.19	128.34	96.92	31.42	4.085		
8,000.00	7,997.77	7,996.88	7,987.48	15.19	16.67	-114.54	-79.57	93.54	137.47	105.73	31.75	4.330		
8,100.00	8,097.70	8,096.39	8,086.44	15.43	16.78	-115.43	-86.92	100.90	146.67	114.59	32.08	4.572		
8,200.00	8,197.64	8,195.89	8,185.40	15.67	16.89	-110.37	-94.28	108.25	155.89	123.47	32.42	4.808		
8,300.00	8,297.56	8,295.44	8,284.40	15.91	17.00	-101.85	-101.63	115.61	164.87	132.10	32.76	5.032		
8,400.00	8,397.45	8,395.03	8,383.45	16.15	17.12	-98.34	-108.99	122.97	173.67	140.57	33.11	5.246		
8,500.00	8,497.32	8,494.63	8,482.50	16.38	17.24	-96.52	-116.36	130.33	182.47	149.01	33.46	5.454		
8,600.00	8,597.19	8,594.25	8,581.57	16.62	17.36	-94.34	-123.72	137.70	191.09	157.28	33.81	5.651		
8,700.00	8,697.07	8,693.88	8,680.65	16.85	17.49	-91.23	-131.08	145.06	199.57	165.40	34.17	5.841		
8,800.00	8,796.96	8,793.51	8,779.74	17.09	17.62	-92.95	-138.45	152.42	207.91	173.39	34.53	6.022		
8,900.00	8,896.87	8,893.09	8,878.78	17.33	17.75	-105.56	-145.81	159.78	216.80	181.90	34.89	6.213		
9,000.00	8,996.80	8,992.62	8,977.76	17.57	17.89	-100.09	-153.16	167.14	226.12	190.85	35.27	6.412		
9,100.00	9,096.75	9,092.13	9,076.72	17.82	18.03	-118.10	-160.52	174.50	235.53	199.88	35.64	6.608		
9,200.00	9,196.70	9,191.50	9,175.55	18.06	18.18	-146.61	-167.86	181.84	246.12	210.10	36.02	6.833		
9,300.00	9,296.64	9,291.97	9,275.48	18.30	18.33	-137.21	-175.23	189.20	257.37	220.96	36.41	7.069		
9,400.00	9,396.58	9,395.43	9,378.52	18.54	18.48	-117.75	-181.81	195.79	267.02	230.19	36.83	7.250		
9,500.00	9,496.53	9,499.25	9,482.07	18.79	18.64	-111.96	-187.09	201.07	274.44	237.18	37.26	7.366		
9,600.00	9,596.47	9,603.34	9,586.01	19.03	18.79	-87.29	-191.06	205.03	279.23	241.56	37.67	7.412		
9,700.00	9,696.39	9,707.55	9,690.14	19.27	18.95	-87.54	-193.69	207.66	282.05	243.97	38.08	7.407		
9,800.00	9,796.32	9,811.77	9,794.35	19.51	19.11	-88.55	-194.98	208.95	283.35	244.87	38.48	7.363		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 503H - OH - Plan 1 09-05-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11242-MWD+HDGM														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (usft)	Highslide Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,900.00	9,896.23	9,913.65	9,896.23	19.75	19.32	-91.28		-195.12	209.10	283.52	244.58	38.93	7.282		
10,000.00	9,996.15	10,013.57	9,996.15	20.00	19.54	-95.04		-195.12	209.10	283.71	244.31	39.40	7.201		
10,100.00	10,096.08	10,113.50	10,096.08	20.25	19.76	-109.79		-195.12	209.10	284.35	244.47	39.87	7.132		
10,200.00	10,196.03	10,213.45	10,196.03	20.49	19.98	-139.19		-195.12	209.10	286.01	245.67	40.34	7.090		
10,300.00	10,296.00	10,313.42	10,296.00	20.71	20.21	-177.42		-195.12	209.10	288.28	247.50	40.79	7.068		
10,400.00	10,395.97	10,413.40	10,395.97	20.89	20.43	-149.39		-195.12	209.10	290.43	249.25	41.19	7.052		
10,500.00	10,495.95	10,513.37	10,495.95	21.01	20.66	-126.83		-195.12	209.10	291.91	250.37	41.54	7.027		
10,600.00	10,595.94	10,613.36	10,595.94	21.08	20.88	-142.58		-195.12	209.10	293.00	251.16	41.84	7.003		
10,700.00	10,695.63	10,713.05	10,695.63	21.11	21.11	-105.19		-195.12	209.10	295.39	253.31	42.08	7.019		
10,800.00	10,791.50	10,808.92	10,791.50	21.12	21.33	-100.45		-195.12	209.10	301.29	258.98	42.31	7.122		
10,900.00	10,880.02	10,897.44	10,880.02	21.16	21.53	-109.02		-195.12	209.10	314.02	271.49	42.53	7.383		
11,000.00	10,958.70	10,976.12	10,958.70	21.24	21.71	-115.26		-195.12	209.10	342.96	300.18	42.78	8.017		
11,100.00	11,026.51	11,043.93	11,026.51	21.37	21.87	-119.28		-195.12	209.10	387.46	344.42	43.03	9.004		
11,200.00	11,083.86	11,101.28	11,083.86	21.58	22.00	-121.29		-195.12	209.10	446.38	403.10	43.28	10.314		
11,300.00	11,126.68	11,144.10	11,126.68	21.87	22.10	-118.23		-195.12	209.10	518.95	475.46	43.49	11.931		
11,400.00	11,154.67	11,172.09	11,154.67	22.26	22.16	-108.93		-195.12	209.10	600.54	556.88	43.66	13.756		
11,500.00	11,166.33	12,145.64	11,700.79	22.74	24.01	-152.11		435.89	204.68	604.72	563.17	41.56	14.552		
11,600.00	11,169.52	12,245.42	11,699.92	23.29	24.59	-152.39		535.66	203.99	598.67	556.60	42.08	14.228		
11,700.00	11,170.81	12,345.31	11,699.05	23.93	25.23	-152.63		635.55	203.29	594.93	552.26	42.67	13.943		
11,800.00	11,170.08	12,445.28	11,698.18	24.63	25.95	-152.82		735.51	202.59	593.74	550.41	43.33	13.702		
11,843.56	11,169.55	12,488.84	11,697.80	24.96	26.27	-152.87		779.07	202.28	593.63	549.98	43.65	13.600		
11,900.00	11,168.76	12,545.28	11,697.31	25.39	26.72	-152.86		835.50	201.89	593.92	549.84	44.09	13.472		
12,000.00	11,167.38	12,645.27	11,696.43	26.22	27.54	-152.85		935.49	201.19	594.59	549.67	44.92	13.238		
12,100.00	11,166.10	12,745.27	11,695.56	27.09	28.42	-152.85		1,035.49	200.49	595.04	549.23	45.81	12.989		
12,200.00	11,164.16	12,845.27	11,694.69	28.02	29.34	-152.92		1,135.47	199.79	595.85	549.10	46.75	12.746		
12,300.00	11,163.16	12,945.24	11,693.81	28.98	30.30	-152.75		1,235.44	199.09	596.90	549.10	47.80	12.488		
12,400.00	11,160.99	13,045.20	11,692.94	29.99	31.30	-152.57		1,335.39	198.39	599.26	550.36	48.91	12.253		
12,500.00	11,158.27	13,145.14	11,692.07	31.03	32.33	-152.43		1,435.33	197.69	602.14	552.07	50.07	12.026		
12,600.00	11,155.45	13,245.09	11,691.20	32.11	33.39	-152.30		1,535.28	196.99	605.03	553.75	51.28	11.799		
12,700.00	11,152.55	13,345.06	11,690.33	33.21	34.48	-152.25		1,635.23	196.29	607.63	555.12	52.51	11.571		
12,800.00	11,149.73	13,445.03	11,689.45	34.34	35.60	-152.25		1,735.20	195.60	609.87	556.09	53.78	11.340		
12,900.00	11,147.73	13,545.02	11,688.58	35.49	36.74	-152.28		1,835.19	194.90	611.02	555.95	55.07	11.095		
13,000.00	11,146.16	13,645.02	11,687.71	36.66	37.90	-152.36		1,935.18	194.20	611.41	555.02	56.38	10.844		
13,100.00	11,143.37	13,744.99	11,686.84	37.84	39.08	-152.58		2,035.14	193.50	612.33	554.66	57.66	10.619		
13,200.00	11,141.36	13,844.97	11,685.96	39.04	40.27	-152.69		2,135.12	192.80	612.92	553.92	59.00	10.388		
13,300.00	11,140.35	13,944.97	11,685.09	40.27	41.48	-152.67		2,235.11	192.10	613.18	552.75	60.43	10.146		
13,400.00	11,139.55	14,044.97	11,684.22	41.50	42.71	-152.69		2,335.10	191.40	613.06	551.18	61.88	9.907		
13,500.00	11,139.16	14,144.97	11,683.35	42.75	43.95	-152.74		2,435.09	190.70	612.25	548.91	63.33	9.667		
13,553.63	11,138.79	14,198.59	11,682.88	43.42	44.62	-152.76		2,488.72	190.33	612.00	547.88	64.12	9.544		
13,600.00	11,138.10	14,244.96	11,682.47	44.01	45.20	-152.75		2,535.08	190.00	612.33	547.51	64.82	9.447		
13,700.00	11,136.36	14,344.96	11,681.60	45.28	46.47	-152.80		2,635.07	189.30	613.09	546.78	66.31	9.245		
13,800.00	11,134.44	14,444.95	11,680.73	46.56	47.74	-152.94		2,735.06	188.60	613.50	545.73	67.77	9.052		
13,900.00	11,131.99	14,544.93	11,679.86	47.85	49.02	-152.99		2,835.04	187.90	614.94	545.66	69.29	8.875		
14,000.00	11,129.35	14,644.92	11,678.98	49.15	50.32	-153.06		2,935.01	187.20	616.54	545.73	70.81	8.706		
14,100.00	11,127.30	14,744.91	11,678.11	50.46	51.62	-153.17		3,035.00	186.50	617.29	544.96	72.33	8.534		
14,200.00	11,125.53	14,844.90	11,677.24	51.78	52.92	-153.14		3,134.98	185.80	618.41	544.47	73.94	8.363		
14,300.00	11,123.66	14,944.89	11,676.36	53.10	54.24	-153.23		3,234.97	185.11	619.12	543.61	75.50	8.200		
14,400.00	11,121.94	15,044.88	11,675.49	54.42	55.56	-153.41		3,334.95	184.41	619.16	542.15	77.01	8.040		
14,489.69	11,120.49	15,134.56	11,674.71	55.61	56.75	-153.56		3,424.62	183.78	619.05	540.69	78.36	7.900		
14,500.00	11,120.47	15,144.86	11,674.62	55.75	56.89	-153.59		3,434.92	183.71	618.82	540.31	78.51	7.882		
14,600.00	11,118.28	15,244.84	11,673.75	57.09	58.22	-153.72		3,534.90	183.01	619.56	539.51	80.05	7.740		
14,700.00	11,115.63	15,344.82	11,672.87	58.43	59.56	-153.85		3,634.87	182.31	620.81	539.22	81.59	7.609		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 503H - OH - Plan 1 09-05-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11242-MWD+HDGM														
Reference		Offset		Semi Major Axis		Highside Toolface (°)	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)						
14,800.00	11,113.90	15,444.81	11,672.00	59.78	60.90	153.95	3,734.86	181.61	621.25	538.08	83.17	7.469		
14,815.55	11,113.76	15,460.36	11,671.87	59.99	61.11	153.96	3,750.41	181.50	621.22	537.79	83.43	7.446		
14,900.00	11,112.44	15,544.81	11,671.13	61.13	62.25	153.94	3,834.85	180.91	621.87	537.04	84.83	7.331		
15,000.00	11,107.78	15,644.71	11,670.26	62.49	63.60	153.87	3,934.74	180.21	626.20	539.68	86.52	7.238		
15,100.00	11,100.29	15,744.44	11,669.39	63.86	64.95	153.87	4,034.47	179.51	633.43	545.26	88.17	7.184		
15,200.00	11,093.78	15,844.26	11,668.52	65.23	66.31	153.98	4,134.28	178.82	639.44	549.63	89.82	7.120		
15,300.00	11,090.64	15,944.22	11,667.64	66.60	67.67	154.01	4,234.23	178.12	641.93	550.42	91.51	7.015		
15,400.00	11,088.46	16,044.21	11,666.77	67.97	69.04	154.05	4,334.22	177.42	643.16	549.98	93.17	6.903		
15,500.00	11,085.18	16,144.17	11,665.90	69.34	70.41	154.25	4,434.17	176.72	644.79	550.08	94.70	6.808		
15,600.00	11,082.81	16,244.16	11,665.03	70.72	71.78	154.32	4,534.15	176.02	646.05	549.70	96.35	6.705		
15,700.00	11,080.37	16,344.15	11,664.15	72.10	73.15	154.35	4,634.14	175.32	647.60	549.57	98.03	6.606		
15,800.00	11,077.84	16,444.13	11,663.28	73.48	74.53	154.48	4,734.11	174.62	648.81	549.17	99.64	6.512		
15,859.00	11,076.45	16,498.73	11,662.81	74.30	75.28	154.56	4,788.71	174.24	649.33	548.83	100.50	6.461		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well													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)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	20.00	0.00	0.00	54.24	108.29	150.38	186.39					
100.00	100.00	80.00	100.00	0.14	1.21	-130.90	108.29	150.38	185.37	184.03	1.34	138.461		
200.00	200.00	181.21	201.20	0.40	3.94	-139.85	108.56	150.38	185.72	181.38	4.33	42.866		
219.78	219.78	201.80	221.78	0.45	4.55	-138.20	108.26	150.38	185.60	180.59	5.00	37.100		
300.00	300.00	281.24	301.20	0.66	6.93	-132.54	108.56	150.38	185.98	178.39	7.59	24.501		
319.92	319.92	301.97	321.93	0.71	7.55	-136.68	108.26	150.38	185.86	177.59	8.26	22.491		
400.00	400.00	381.26	401.20	0.91	9.93	-162.12	108.56	150.38	186.18	175.34	10.84	17.173		
419.94	419.94	402.02	421.95	0.96	10.55	-159.20	108.26	150.38	186.06	174.55	11.51	16.162		
500.00	500.00	481.28	501.21	1.16	12.92	-151.49	108.56	150.38	186.46	172.38	14.08	13.240		
519.87	519.87	501.97	521.89	1.21	13.54	-149.04	108.26	150.38	186.35	171.60	14.75	12.630		
600.00	600.00	581.31	601.21	1.42	15.92	-137.22	108.56	150.38	186.75	169.42	17.34	10.772		
619.90	619.90	602.03	621.92	1.47	16.54	-138.23	108.26	150.38	186.63	168.62	18.01	10.362		
700.00	700.00	681.33	701.21	1.68	18.92	-141.54	108.56	150.38	186.96	166.36	20.60	9.076		
719.87	719.87	702.02	721.90	1.73	19.54	-141.16	108.26	150.38	186.85	165.58	21.27	8.784		
800.00	800.00	781.36	801.22	1.95	21.92	-139.69	108.56	150.38	187.27	163.41	23.86	7.848		
819.81	819.81	801.99	821.85	2.00	22.53	-142.25	108.26	150.38	187.15	162.62	24.53	7.629		
900.00	900.00	881.38	901.22	2.21	24.91	-153.34	108.56	150.38	187.50	160.38	27.12	6.913		
919.39	919.39	901.57	921.41	2.26	25.52	-153.28	108.26	150.38	187.39	159.61	27.78	6.746		
1,000.00	1,000.00	981.40	1,001.23	2.47	27.91	-151.40	108.56	150.38	187.77	157.38	30.38	6.180		
1,019.82	1,019.82	1,002.05	1,021.87	2.52	28.53	-153.65	108.26	150.38	187.64	156.59	31.05	6.043		
1,100.00	1,100.00	1,081.43	1,101.23	2.73	30.91	-173.72	108.56	150.38	187.95	154.32	33.63	5.588		
1,120.22	1,120.22	1,100.42	1,120.22	2.78	31.48	-170.08	108.29	150.38	187.82	153.56	34.25	5.483		
1,200.00	1,200.00	1,181.45	1,201.23	2.98	33.90	-160.66	108.56	150.38	188.10	151.22	36.88	5.100		
1,219.33	1,219.33	1,201.59	1,221.36	3.03	34.51	-160.59	108.26	150.38	187.97	150.43	37.54	5.008		
1,300.00	1,299.99	1,281.47	1,301.23	3.24	36.90	-161.64	108.56	150.38	188.29	148.15	40.14	4.691		
1,319.76	1,319.76	1,302.06	1,321.81	3.29	37.52	-162.40	108.26	150.38	188.16	147.35	40.81	4.611		
1,400.00	1,399.99	1,381.49	1,401.24	3.50	39.90	-164.63	108.55	150.38	188.56	145.16	43.40	4.345		
1,419.74	1,419.73	1,402.06	1,421.80	3.56	40.51	-164.57	108.26	150.38	188.45	144.39	44.07	4.277		
1,500.00	1,499.99	1,481.52	1,501.24	3.77	42.89	-164.11	108.55	150.38	188.89	142.23	46.66	4.048		
1,519.49	1,519.48	1,501.82	1,521.54	3.82	43.50	-164.04	108.26	150.38	188.78	141.47	47.32	3.990		
1,600.00	1,599.99	1,581.54	1,601.24	4.02	45.89	-169.59	108.55	150.38	189.22	139.30	49.92	3.791		
1,619.70	1,619.69	1,602.07	1,621.76	4.07	46.51	-172.50	108.25	150.38	189.10	138.53	50.57	3.739		
1,700.00	1,699.99	1,681.56	1,701.25	4.24	48.89	-145.86	108.55	150.38	189.47	136.34	53.13	3.566		
1,800.00	1,799.99	1,781.58	1,801.24	4.32	51.89	-40.68	108.55	150.38	189.28	133.07	56.20	3.368		
1,900.00	1,899.99	1,881.59	1,901.24	4.31	54.88	-30.94	108.55	150.38	188.83	129.64	59.19	3.190		
2,000.00	1,999.99	1,981.61	2,001.23	4.32	57.88	-32.65	108.55	150.38	188.39	126.19	62.20	3.029		
2,100.00	2,099.99	2,081.62	2,101.22	4.34	60.88	-34.05	108.55	150.38	187.89	122.67	65.22	2.881		
2,200.00	2,199.99	2,181.63	2,201.21	4.38	63.87	-22.50	108.55	150.38	187.37	119.12	68.26	2.745		
2,300.00	2,299.99	2,281.65	2,301.21	4.45	66.87	-15.35	108.55	150.38	187.00	115.67	71.32	2.622		
2,400.00	2,399.98	2,381.67	2,401.21	4.57	69.87	-51.51	108.55	150.38	186.76	112.32	74.44	2.509		
2,500.00	2,499.98	2,481.69	2,501.21	4.71	72.86	-25.69	108.55	150.38	186.45	108.89	77.57	2.404		
2,600.00	2,599.98	2,581.71	2,601.21	4.83	75.86	-24.57	108.55	150.38	185.90	105.21	80.69	2.304		
2,700.00	2,699.98	2,681.73	2,701.20	4.96	78.86	-17.72	108.55	150.38	185.12	101.30	83.82	2.209		
2,800.00	2,799.97	2,781.74	2,801.19	5.11	81.86	-28.01	108.55	150.38	184.02	97.06	86.96	2.116		
2,900.00	2,899.96	2,881.74	2,901.18	5.26	84.85	-21.48	108.55	150.38	182.76	92.65	90.11	2.028		
3,000.00	2,999.95	2,981.75	3,001.16	5.43	87.85	-32.71	108.55	150.38	181.26	87.99	93.27	1.943		
3,100.00	3,099.94	3,081.76	3,101.16	5.62	90.85	-92.90	108.55	150.38	180.62	84.15	96.47	1.872		
3,119.43	3,119.37	3,101.99	3,121.38	5.66	91.45	-101.71	108.26	150.38	180.46	83.36	97.10	1.858 CC		
3,200.00	3,199.94	3,181.79	3,201.16	5.80	93.84	-129.39	108.55	150.38	180.96	81.32	99.64	1.816		
3,219.07	3,219.01	3,201.64	3,221.01	5.82	94.44	-116.87	108.26	150.38	180.85	80.60	100.25	1.804		
3,300.00	3,299.94	3,281.80	3,301.16	5.92	96.84	-72.20	108.55	150.38	180.98	78.22	102.76	1.761		
3,361.22	3,361.16	3,341.00	3,360.34	6.00	98.61	-60.71	108.29	150.38	180.64	76.03	104.61	1.727 ES, SF		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Gulf - Federal - OH - Assumed Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-INC-ONLY-Offset Well													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		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	
3,400.00	3,399.93	3,341.00	3,360.34	6.04	98.61	52.28	108.29	150.38	184.74	82.50	102.24	1.807	
3,500.00	3,499.93	3,341.00	3,360.34	6.17	98.61	46.43	108.29	150.38	227.80	144.87	82.94	2.747	
3,600.00	3,599.93	3,341.00	3,360.34	6.30	98.61	75.97	108.29	150.38	299.45	236.22	63.23	4.736	
3,700.00	3,699.93	3,341.00	3,360.34	6.45	98.61	125.63	108.29	150.38	384.26	334.64	49.62	7.744	
3,800.00	3,799.92	3,341.00	3,360.34	6.62	98.61	139.56	108.29	150.38	475.12	434.59	40.53	11.722	
3,900.00	3,899.92	3,341.00	3,360.34	6.79	98.61	146.22	108.29	150.38	569.13	534.87	34.25	16.615	
4,000.00	3,999.92	3,341.00	3,360.34	6.97	98.61	129.84	108.29	150.38	664.90	635.18	29.72	22.371	
4,100.00	4,099.91	3,341.00	3,360.34	7.15	98.61	125.59	108.29	150.38	761.72	735.43	26.29	28.970	
4,200.00	4,199.90	3,341.00	3,360.34	7.34	98.61	134.99	108.29	150.38	859.30	835.64	23.66	36.315	
4,300.00	4,299.90	3,341.00	3,360.34	7.53	98.61	-104.71	108.29	150.38	957.37	935.80	21.56	44.397	
4,400.00	4,399.90	3,341.00	3,360.34	7.71	98.61	115.38	108.29	150.38	1,055.75	1,035.91	19.84	53.209	
4,500.00	4,499.89	3,341.00	3,360.34	7.89	98.61	107.12	108.29	150.38	1,154.41	1,135.99	18.43	62.644	
4,600.00	4,599.89	3,341.00	3,360.34	8.08	98.61	111.24	108.29	150.38	1,253.28	1,236.04	17.24	72.678	
4,700.00	4,699.88	3,341.00	3,360.34	8.27	98.61	103.47	108.29	150.38	1,352.30	1,336.07	16.23	83.296	
4,800.00	4,799.88	3,341.00	3,360.34	8.45	98.61	-146.19	108.29	150.38	1,451.48	1,436.09	15.39	94.324	
4,900.00	4,899.87	3,341.00	3,360.34	8.65	98.61	105.63	108.29	150.38	1,550.76	1,536.11	14.66	105.788	
5,000.00	4,999.87	3,341.00	3,360.34	8.84	98.61	102.44	108.29	150.38	1,650.12	1,636.10	14.02	117.697	
5,100.00	5,099.86	3,341.00	3,360.34	9.03	98.61	102.36	108.29	150.38	1,749.54	1,736.08	13.46	129.963	
5,200.00	5,199.86	3,341.00	3,360.34	9.23	98.61	88.19	108.29	150.38	1,849.02	1,836.05	12.97	142.560	
5,300.00	5,299.85	3,341.00	3,360.34	9.42	98.61	96.31	108.29	150.38	1,948.52	1,936.00	12.53	155.547	
5,400.00	5,399.85	3,341.00	3,360.34	9.63	98.61	119.47	108.29	150.38	2,048.12	2,035.96	12.16	168.488	
5,500.00	5,499.85	3,341.00	3,360.34	9.85	98.61	149.04	108.29	150.38	2,147.74	2,135.92	11.82	181.667	
5,600.00	5,599.85	3,341.00	3,360.34	10.03	98.61	-69.32	108.29	150.38	2,247.39	2,235.87	11.52	195.107	
5,700.00	5,699.84	3,341.00	3,360.34	10.19	98.61	-122.86	108.29	150.38	2,347.05	2,335.80	11.24	208.762	
5,800.00	5,799.84	3,341.00	3,360.34	10.37	98.61	-134.74	108.29	150.38	2,446.76	2,435.75	11.01	222.193	
5,900.00	5,899.84	3,341.00	3,360.34	10.56	98.61	-132.83	108.29	150.38	2,546.50	2,535.69	10.81	235.628	
6,000.00	5,999.83	3,341.00	3,360.34	10.76	98.61	-119.85	108.29	150.38	2,646.31	2,635.65	10.66	248.251	
6,100.00	6,099.75	3,341.00	3,360.34	10.96	98.61	-104.47	108.29	150.38	2,746.20	2,735.61	10.59	259.293	
6,200.00	6,199.65	3,341.00	3,360.34	11.16	98.61	-110.20	108.29	150.38	2,846.11	2,835.56	10.56	269.632	
6,300.00	6,299.55	3,341.00	3,360.34	11.37	98.61	-108.37	108.29	150.38	2,946.04	2,935.50	10.53	279.758	
6,400.00	6,399.46	3,341.00	3,360.34	11.58	98.61	-114.52	108.29	150.38	3,045.96	3,035.45	10.51	289.765	
6,500.00	6,499.38	3,341.00	3,360.34	11.79	98.61	-119.07	108.29	150.38	3,145.89	3,135.39	10.49	299.843	
6,600.00	6,599.32	3,341.00	3,360.34	12.01	98.61	-121.01	108.29	150.38	3,245.81	3,235.34	10.47	310.059	
6,700.00	6,699.26	3,341.00	3,360.34	12.22	98.61	-112.61	108.29	150.38	3,345.72	3,335.27	10.45	320.212	
6,800.00	6,799.17	3,341.00	3,360.34	12.44	98.61	-108.56	108.29	150.38	3,445.66	3,435.20	10.46	329.512	
6,900.00	6,899.07	3,341.00	3,360.34	12.66	98.61	-108.56	108.29	150.38	3,545.61	3,535.13	10.48	338.251	
7,000.00	6,998.97	3,341.00	3,360.34	12.88	98.61	-110.14	108.29	150.38	3,645.56	3,635.05	10.51	346.812	
7,100.00	7,098.86	3,341.00	3,360.34	13.11	98.61	-119.66	108.29	150.38	3,745.53	3,734.97	10.55	354.960	
7,200.00	7,198.77	3,341.00	3,360.34	13.34	98.61	-119.31	108.29	150.38	3,845.49	3,834.90	10.59	363.059	
7,300.00	7,298.67	3,341.00	3,360.34	13.56	98.61	-89.20	108.29	150.38	3,945.44	3,934.81	10.63	371.085	
7,400.00	7,398.55	3,341.00	3,360.34	13.78	98.61	-96.13	108.29	150.38	4,045.38	4,034.70	10.68	378.841	
7,500.00	7,498.44	3,341.00	3,360.34	14.01	98.61	-101.56	108.29	150.38	4,145.34	4,134.61	10.73	386.258	
7,600.00	7,598.30	3,341.00	3,360.34	14.25	98.61	-83.66	108.29	150.38	4,245.32	4,234.51	10.81	392.760	
7,700.00	7,698.13	3,341.00	3,360.34	14.48	98.61	-82.47	108.29	150.38	4,345.30	4,334.40	10.90	398.789	
7,800.00	7,797.98	3,341.00	3,360.34	14.72	98.61	-100.44	108.29	150.38	4,445.28	4,434.30	10.98	404.784	
7,900.00	7,897.86	3,341.00	3,360.34	14.96	98.61	-115.33	108.29	150.38	4,545.26	4,534.20	11.06	411.029	
8,000.00	7,997.77	3,341.00	3,360.34	15.19	98.61	-129.64	108.29	150.38	4,645.23	4,634.11	11.12	417.737	
8,100.00	8,097.70	3,341.00	3,360.34	15.43	98.61	-134.45	108.29	150.38	4,745.19	4,734.01	11.18	424.430	
8,200.00	8,197.64	3,341.00	3,360.34	15.67	98.61	-128.26	108.29	150.38	4,845.16	4,833.92	11.24	430.987	
8,300.00	8,297.56	3,341.00	3,360.34	15.91	98.61	-104.18	108.29	150.38	4,945.12	4,933.82	11.31	437.330	
8,400.00	8,397.45	3,341.00	3,360.34	16.15	98.61	-85.73	108.29	150.38	5,045.08	5,033.69	11.39	442.999	
8,500.00	8,497.32	3,341.00	3,360.34	16.38	98.61	-83.04	108.29	150.38	5,145.04	5,133.56	11.48	448.352	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Gulf - Federal - OH - Assumed Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well													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		
8,600.00	8,597.19	3,341.00	3,360.34	16.62	98.61	-82.95	108.29	150.38	5,244.99	5,233.43	11.56	453.552		
8,700.00	8,697.07	3,341.00	3,360.34	16.85	98.61	-84.83	108.29	150.38	5,344.95	5,333.29	11.65	458.719		
8,800.00	8,796.96	3,341.00	3,360.34	17.09	98.61	-92.77	108.29	150.38	5,444.90	5,433.16	11.74	463.885		
8,900.00	8,896.87	3,341.00	3,360.34	17.33	98.61	-129.32	108.29	150.38	5,544.86	5,533.04	11.82	468.967		
9,000.00	8,996.80	3,341.00	3,360.34	17.57	98.61	-125.95	108.29	150.38	5,644.83	5,632.93	11.91	474.102		
9,100.00	9,096.75	3,341.00	3,360.34	17.82	98.61	-169.08	108.29	150.38	5,744.80	5,732.81	11.99	479.182		
9,200.00	9,196.70	3,341.00	3,360.34	18.06	98.61	128.68	108.29	150.38	5,844.77	5,832.70	12.07	484.163		
9,300.00	9,296.64	3,341.00	3,360.34	18.30	98.61	132.60	108.29	150.38	5,944.74	5,932.58	12.16	488.871		
9,400.00	9,396.58	3,341.00	3,360.34	18.54	98.61	-171.53	108.29	150.38	6,044.73	6,032.47	12.26	493.167		
9,500.00	9,496.53	3,341.00	3,360.34	18.79	98.61	-162.67	108.29	150.38	6,144.70	6,132.35	12.35	497.673		
9,600.00	9,596.47	3,341.00	3,360.34	19.03	98.61	-95.11	108.29	150.38	6,244.66	6,232.22	12.44	501.851		
9,700.00	9,696.39	3,341.00	3,360.34	19.27	98.61	-104.83	108.29	150.38	6,344.62	6,332.08	12.54	505.911		
9,800.00	9,796.32	3,341.00	3,360.34	19.51	98.61	-96.75	108.29	150.38	6,444.58	6,431.94	12.64	509.776		
9,900.00	9,896.23	3,341.00	3,360.34	19.75	98.61	-95.44	108.29	150.38	6,544.55	6,531.80	12.75	513.263		
10,000.00	9,996.15	3,341.00	3,360.34	20.00	98.61	-106.29	108.29	150.38	6,644.52	6,631.65	12.86	516.652		
10,100.00	10,096.08	3,341.00	3,360.34	20.25	98.61	-146.20	108.29	150.38	6,744.49	6,731.52	12.97	519.964		
10,200.00	10,196.03	3,341.00	3,360.34	20.49	98.61	145.56	108.29	150.38	6,844.47	6,831.39	13.08	523.354		
10,300.00	10,296.00	3,341.00	3,360.34	20.71	98.61	98.33	108.29	150.38	6,944.41	6,931.24	13.17	527.106		
10,400.00	10,395.97	3,341.00	3,360.34	20.89	98.61	68.95	108.29	150.38	7,044.30	7,031.04	13.26	531.373		
10,500.00	10,495.95	3,341.00	3,360.34	21.01	98.61	52.44	108.29	150.38	7,144.14	7,130.81	13.33	535.960		
10,600.00	10,595.94	3,341.00	3,360.34	21.08	98.61	68.17	108.29	150.38	7,243.98	7,221.17	22.81	317.560		
10,700.00	10,695.63	3,341.00	3,360.34	21.11	98.61	10.36	108.29	150.38	7,343.39	7,316.84	26.56	276.529		
10,800.00	10,791.50	3,341.00	3,360.34	21.12	98.61	4.11	108.29	150.38	7,438.27	7,411.69	26.58	279.884		
10,900.00	10,880.02	3,341.00	3,360.34	21.16	98.61	3.11	108.29	150.38	7,525.38	7,498.94	26.45	284.544		
11,000.00	10,958.70	3,341.00	3,360.34	21.24	98.61	2.51	108.29	150.38	7,602.80	7,576.50	26.30	289.056		
11,100.00	11,026.51	3,341.00	3,360.34	21.37	98.61	2.21	108.29	150.38	7,669.79	7,643.54	26.25	292.199		
11,200.00	11,083.86	3,341.00	3,360.34	21.58	98.61	1.99	108.29	150.38	7,727.07	7,700.65	26.42	292.519		
11,300.00	11,126.68	3,341.00	3,360.34	21.87	98.61	1.83	108.29	150.38	7,770.84	7,743.97	26.87	289.149		
11,400.00	11,154.67	3,341.00	3,360.34	22.26	98.61	1.80	108.29	150.38	7,800.95	7,773.34	27.62	282.487		
11,500.00	11,166.33	3,341.00	3,360.34	22.74	98.61	1.78	108.29	150.38	7,815.92	7,787.36	28.56	273.656		
11,600.00	11,169.52	3,341.00	3,360.34	23.29	98.61	1.79	108.29	150.38	7,823.71	7,794.04	29.67	263.700		
11,700.00	11,170.81	3,341.00	3,360.34	23.93	98.61	1.70	108.29	150.38	7,830.92	7,800.02	30.90	253.436		
11,800.00	11,170.08	3,341.00	3,360.34	24.63	98.61	1.65	108.29	150.38	7,837.43	7,805.21	32.21	243.288		
11,900.00	11,168.76	3,341.00	3,360.34	25.39	98.61	1.55	108.29	150.38	7,844.68	7,811.08	33.60	233.505		
12,000.00	11,167.38	3,341.00	3,360.34	26.22	98.61	1.55	108.29	150.38	7,853.15	7,818.13	35.02	224.228		
12,100.00	11,166.10	3,341.00	3,360.34	27.09	98.61	1.58	108.29	150.38	7,862.99	7,826.50	36.48	215.514		
12,200.00	11,164.16	3,341.00	3,360.34	28.02	98.61	1.53	108.29	150.38	7,873.40	7,835.43	37.97	207.333		
12,300.00	11,163.16	3,341.00	3,360.34	28.98	98.61	1.37	108.29	150.38	7,886.07	7,846.58	39.49	199.682		
12,400.00	11,160.99	3,341.00	3,360.34	29.99	98.61	1.37	108.29	150.38	7,898.85	7,857.81	41.03	192.500		
12,500.00	11,158.27	3,341.00	3,360.34	31.03	98.61	1.37	108.29	150.38	7,912.31	7,869.72	42.59	185.783		
12,600.00	11,155.45	3,341.00	3,360.34	32.11	98.61	1.42	108.29	150.38	7,926.92	7,882.76	44.16	179.509		
12,700.00	11,152.55	3,341.00	3,360.34	33.21	98.61	1.49	108.29	150.38	7,942.66	7,896.92	45.74	173.652		
12,800.00	11,149.73	3,341.00	3,360.34	34.34	98.61	1.59	108.29	150.38	7,959.69	7,912.36	47.33	168.184		
12,900.00	11,147.73	3,341.00	3,360.34	35.49	98.61	1.65	108.29	150.38	7,978.71	7,929.79	48.92	163.094		
13,000.00	11,146.16	3,341.00	3,360.34	36.66	98.61	1.84	108.29	150.38	7,999.34	7,948.83	50.52	158.350		
13,100.00	11,143.37	3,341.00	3,360.34	37.84	98.61	1.91	108.29	150.38	8,019.94	7,967.83	52.12	153.887		
13,200.00	11,141.36	3,341.00	3,360.34	39.04	98.61	1.61	108.29	150.38	8,042.52	7,988.80	53.72	149.720		
13,300.00	11,140.35	3,341.00	3,360.34	40.27	98.61	1.62	108.29	150.38	8,067.26	8,011.95	55.32	145.836		
13,400.00	11,139.55	3,341.00	3,360.34	41.50	98.61	1.73	108.29	150.38	8,093.37	8,036.45	56.91	142.202		
13,500.00	11,139.16	3,341.00	3,360.34	42.75	98.61	1.81	108.29	150.38	8,120.99	8,062.49	58.51	138.808		
13,600.00	11,138.10	3,341.00	3,360.34	44.01	98.61	1.59	108.29	150.38	8,149.12	8,089.03	60.09	135.608		
13,700.00	11,136.36	3,341.00	3,360.34	45.28	98.61	1.73	108.29	150.38	8,177.74	8,116.06	61.68	132.591		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design											Gulf - Federal - OH - Assumed Surveys				Offset Site Error: 0.00 usft	
Survey Program: 100-INC-ONLY-Offset Well											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				
13,800.00	11,134.44	3,341.00	3,360.34	46.56	98.61	1.81	108.29	150.38	8,207.27	8,144.02	63.25	129.756				
13,900.00	11,131.99	3,341.00	3,360.34	47.85	98.61	1.54	108.29	150.38	8,237.44	8,172.62	64.82	127.080				
14,000.00	11,129.35	3,341.00	3,360.34	49.15	98.61	1.72	108.29	150.38	8,268.53	8,202.15	66.38	124.561				
14,100.00	11,127.30	3,341.00	3,360.34	50.46	98.61	1.63	108.29	150.38	8,301.23	8,233.30	67.93	122.204				
14,200.00	11,125.53	3,341.00	3,360.34	51.78	98.61	1.55	108.29	150.38	8,335.32	8,265.85	69.47	119.992				
14,300.00	11,123.66	3,341.00	3,360.34	53.10	98.61	1.87	108.29	150.38	8,370.34	8,299.35	70.99	117.911				
14,400.00	11,121.94	3,341.00	3,360.34	54.42	98.61	2.10	108.29	150.38	8,406.50	8,334.00	72.50	115.956				
14,500.00	11,120.47	3,341.00	3,360.34	55.75	98.61	1.94	108.29	150.38	8,443.91	8,369.92	73.99	114.121				
14,600.00	11,118.28	3,341.00	3,360.34	57.09	98.61	1.80	108.29	150.38	8,481.71	8,406.23	75.47	112.381				
14,700.00	11,115.63	3,341.00	3,360.34	58.43	98.61	1.79	108.29	150.38	8,520.08	8,443.14	76.94	110.733				
14,800.00	11,113.90	3,341.00	3,360.34	59.78	98.61	1.77	108.29	150.38	8,560.31	8,481.92	78.39	109.197				
14,900.00	11,112.44	3,341.00	3,360.34	61.13	98.61	1.21	108.29	150.38	8,601.78	8,521.95	79.83	107.755				
15,000.00	11,107.78	3,341.00	3,360.34	62.49	98.61	0.80	108.29	150.38	8,641.32	8,560.07	81.26	106.345				
15,100.00	11,100.29	3,341.00	3,360.34	63.86	98.61	0.75	108.29	150.38	8,679.25	8,596.57	82.68	104.969				
15,200.00	11,093.78	3,341.00	3,360.34	65.23	98.61	1.21	108.29	150.38	8,719.05	8,634.96	84.09	103.685				
15,300.00	11,090.64	3,341.00	3,360.34	66.60	98.61	1.45	108.29	150.38	8,762.85	8,677.38	85.47	102.527				
15,400.00	11,088.46	3,341.00	3,360.34	67.97	98.61	1.80	108.29	150.38	8,808.39	8,721.57	86.82	101.454				
15,500.00	11,085.18	3,341.00	3,360.34	69.34	98.61	2.02	108.29	150.38	8,853.82	8,765.66	88.16	100.428				
15,600.00	11,082.81	3,341.00	3,360.34	70.72	98.61	1.52	108.29	150.38	8,900.97	8,811.49	89.48	99.476				
15,700.00	11,080.37	3,341.00	3,360.34	72.10	98.61	1.65	108.29	150.38	8,948.94	8,858.16	90.78	98.579				
15,800.00	11,077.84	3,341.00	3,360.34	73.48	98.61	2.01	108.29	150.38	8,997.66	8,905.60	92.06	97.736				
15,859.00	11,076.45	3,341.00	3,360.34	74.30	98.61	2.01	108.29	150.38	9,026.89	8,934.08	92.81	97.265				

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Keohane A - 1 - OH - Assumed Surveys											Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well											Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		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	20.00	0.00	0.00	77.00	110.73	479.55	492.57			
100.00	100.00	80.00	100.00	0.14	1.21	-108.12	110.73	479.55	492.18	490.84	1.34	368.434
200.00	200.00	181.24	201.22	0.40	3.94	-117.02	110.99	479.55	492.36	488.03	4.33	113.725
219.96	219.96	202.03	222.01	0.45	4.56	-115.39	110.69	479.55	492.32	487.32	5.01	98.364
300.00	300.00	281.26	301.23	0.66	6.93	-109.67	110.99	479.55	492.49	484.90	7.59	64.890
319.88	319.88	301.97	321.93	0.71	7.55	-113.83	110.69	479.55	492.45	484.19	8.26	59.613
400.00	400.00	381.29	401.23	0.91	9.93	-139.22	110.99	479.55	492.62	481.77	10.84	45.440
419.15	419.15	401.24	421.18	0.96	10.53	-136.45	110.70	479.55	492.59	481.10	11.49	42.887
500.00	500.00	481.31	501.23	1.16	12.93	-128.60	110.99	479.55	492.85	478.77	14.08	34.966
519.66	519.65	501.79	521.71	1.21	13.54	-126.21	110.69	479.55	492.83	478.08	14.75	33.418
600.00	600.00	581.33	601.24	1.42	15.92	-114.29	110.99	479.55	493.02	475.69	17.34	28.436
619.88	619.88	602.05	621.95	1.47	16.54	-115.33	110.69	479.55	492.98	474.97	18.01	27.371
700.00	700.00	681.36	701.24	1.68	18.92	-118.58	110.99	479.55	493.14	472.54	20.60	23.939
719.78	719.78	701.98	721.85	1.73	19.54	-118.23	110.69	479.55	493.11	471.84	21.27	23.184
800.00	800.00	781.38	801.25	1.95	21.92	-116.69	110.99	479.55	493.33	469.47	23.86	20.675
819.85	819.85	802.08	821.93	2.00	22.54	-119.29	110.69	479.55	493.30	468.76	24.53	20.106
900.00	900.00	881.41	901.25	2.21	24.91	-130.33	110.99	479.55	493.48	466.36	27.12	18.194
919.37	919.37	901.60	921.44	2.26	25.52	-130.30	110.70	479.55	493.46	465.68	27.78	17.764
1,000.00	1,000.00	981.43	1,001.25	2.47	27.91	-128.37	110.99	479.55	493.67	463.29	30.38	16.248
1,019.80	1,019.79	1,002.07	1,021.89	2.52	28.53	-130.66	110.69	479.55	493.64	462.59	31.05	15.897
1,100.00	1,100.00	1,081.45	1,101.26	2.73	30.91	-150.69	110.99	479.55	493.81	460.18	33.63	14.682
1,119.69	1,119.69	1,101.99	1,121.78	2.78	31.52	-147.16	110.69	479.55	493.77	459.47	34.30	14.396
1,200.00	1,200.00	1,181.48	1,201.26	2.98	33.90	-137.62	110.99	479.55	493.94	457.05	36.89	13.391
1,219.36	1,219.35	1,201.66	1,221.43	3.03	34.51	-137.59	110.70	479.55	493.90	456.36	37.54	13.156
1,300.00	1,299.99	1,281.50	1,301.26	3.24	36.90	-138.60	110.99	479.55	494.09	453.94	40.14	12.308
1,319.60	1,319.60	1,301.94	1,321.69	3.29	37.51	-139.40	110.69	479.55	494.06	453.25	40.81	12.107
1,400.00	1,399.99	1,381.52	1,401.26	3.50	39.90	-141.59	110.99	479.55	494.31	450.90	43.40	11.389
1,500.00	1,499.99	1,481.55	1,501.27	3.77	42.90	-141.06	110.99	479.55	494.57	447.91	46.66	10.599
1,600.00	1,599.99	1,581.57	1,601.27	4.02	45.89	-146.54	110.99	479.55	494.84	444.93	49.92	9.913
1,700.00	1,699.99	1,681.59	1,701.27	4.24	48.89	-168.90	110.99	479.55	495.06	441.93	53.13	9.317
1,800.00	1,799.99	1,781.61	1,801.27	4.32	51.89	-63.68	110.99	479.55	494.98	438.77	56.20	8.807
1,900.00	1,899.99	1,881.62	1,901.26	4.31	54.88	53.91	110.99	479.55	494.69	435.49	59.19	8.357
2,000.00	1,999.99	1,981.64	2,001.26	4.32	57.88	55.59	110.99	479.55	494.38	432.18	62.20	7.948
2,100.00	2,099.99	2,081.65	2,101.25	4.34	60.88	56.93	110.99	479.55	494.06	428.84	65.22	7.575
2,200.00	2,199.99	2,181.66	2,201.24	4.38	63.87	45.36	110.99	479.55	493.70	425.44	68.26	7.233
2,300.00	2,299.99	2,281.68	2,301.24	4.45	66.87	7.51	110.99	479.55	493.37	422.05	71.32	6.917
2,400.00	2,399.98	2,381.70	2,401.24	4.57	69.87	-28.60	110.99	479.55	493.08	418.64	74.44	6.624
2,500.00	2,499.98	2,481.72	2,501.24	4.71	72.87	-2.72	110.99	479.55	492.69	415.12	77.57	6.351
2,600.00	2,599.98	2,581.74	2,601.24	4.83	75.86	-1.53	110.99	479.55	492.09	411.40	80.69	6.098
2,700.00	2,699.98	2,681.75	2,701.23	4.96	78.86	5.43	110.99	479.55	491.25	407.43	83.82	5.861
2,800.00	2,799.97	2,781.76	2,801.22	5.11	81.86	-4.71	110.99	479.55	490.05	403.09	86.96	5.635
2,900.00	2,899.96	2,881.77	2,901.21	5.26	84.85	1.99	110.99	479.55	488.68	398.56	90.11	5.423
3,000.00	2,999.95	2,981.78	3,001.19	5.43	87.85	-9.02	110.99	479.55	487.00	393.73	93.28	5.221
3,100.00	3,099.94	3,081.79	3,101.19	5.62	90.85	-68.98	110.99	479.55	486.03	389.56	96.47	5.038
3,132.68	3,132.61	3,113.22	3,132.61	5.68	91.79	-89.71	110.73	479.55	485.92	388.46	97.47	4.985 CC
3,200.00	3,199.94	3,181.82	3,201.19	5.80	93.84	153.30	110.99	479.55	486.32	386.68	99.64	4.881
3,300.00	3,299.94	3,281.83	3,301.18	5.92	96.84	95.97	110.99	479.55	486.62	383.86	102.76	4.735
3,400.00	3,399.93	3,381.84	3,401.17	6.04	99.84	75.94	110.99	479.55	486.53	380.66	105.88	4.595
3,500.00	3,499.93	3,481.85	3,501.16	6.17	102.83	70.13	110.99	479.55	486.35	377.35	109.00	4.462
3,600.00	3,599.93	3,581.86	3,601.16	6.30	105.83	99.79	110.99	479.55	486.18	374.04	112.13	4.336
3,619.33	3,619.26	3,601.98	3,621.27	6.33	106.43	109.94	110.69	479.55	486.14	373.37	112.76	4.311
3,700.00	3,699.93	3,681.88	3,701.15	6.45	108.83	149.46	110.99	479.55	486.57	371.29	115.28	4.221 ES, SF

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Keohane A - 1 - OH - Assumed Surveys													Offset Well Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well														
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)				
3,800.00	3,799.92	3,724.00	3,743.26	6.62	110.09	163.44	110.73	479.55	490.41	374.48	115.93	4.230		
3,900.00	3,899.92	3,724.00	3,743.26	6.79	110.09	170.18	110.73	479.55	512.50	401.19	111.32	4.604		
4,000.00	3,999.92	3,724.00	3,743.26	6.97	110.09	154.05	110.73	479.55	552.19	448.47	103.72	5.324		
4,100.00	4,099.91	3,724.00	3,743.26	7.15	110.09	150.12	110.73	479.55	605.85	510.95	94.90	6.384		
4,200.00	4,199.90	3,724.00	3,743.26	7.34	110.09	159.54	110.73	479.55	670.37	584.22	86.16	7.781		
4,300.00	4,299.90	3,724.00	3,743.26	7.53	110.09	-84.57	110.73	479.55	742.52	664.43	78.09	9.509		
4,400.00	4,399.90	3,724.00	3,743.26	7.71	110.09	140.69	110.73	479.55	820.35	749.43	70.93	11.566		
4,500.00	4,499.89	3,724.00	3,743.26	7.89	110.09	132.31	110.73	479.55	902.83	838.08	64.75	13.943		
4,600.00	4,599.89	3,724.00	3,743.26	8.08	110.09	136.09	110.73	479.55	988.50	929.08	59.42	16.636		
4,700.00	4,699.88	3,724.00	3,743.26	8.27	110.09	128.10	110.73	479.55	1,076.61	1,021.79	54.82	19.639		
4,800.00	4,799.88	3,724.00	3,743.26	8.45	110.09	-125.38	110.73	479.55	1,166.53	1,115.71	50.83	22.952		
4,900.00	4,899.87	3,724.00	3,743.26	8.65	110.09	131.21	110.73	479.55	1,258.07	1,210.69	47.38	26.555		
5,000.00	4,999.87	3,724.00	3,743.26	8.84	110.09	127.82	110.73	479.55	1,350.83	1,306.45	44.37	30.442		
5,100.00	5,099.86	3,724.00	3,743.26	9.03	110.09	127.56	110.73	479.55	1,444.52	1,402.79	41.73	34.613		
5,200.00	5,199.86	3,724.00	3,743.26	9.23	110.09	113.80	110.73	479.55	1,539.01	1,499.60	39.41	39.055		
5,300.00	5,299.85	3,724.00	3,743.26	9.42	110.09	121.95	110.73	479.55	1,634.09	1,596.76	37.33	43.773		
5,400.00	5,399.85	3,724.00	3,743.26	9.63	110.09	143.21	110.73	479.55	1,729.82	1,694.32	35.50	48.722		
5,500.00	5,499.85	3,724.00	3,743.26	9.85	110.09	170.54	110.73	479.55	1,825.92	1,792.07	33.85	53.938		
5,600.00	5,599.85	3,724.00	3,743.26	10.03	110.09	-50.20	110.73	479.55	1,922.34	1,890.00	32.35	59.431		
5,700.00	5,699.84	3,724.00	3,743.26	10.19	110.09	-103.76	110.73	479.55	2,019.05	1,988.08	30.97	65.192		
5,800.00	5,799.84	3,724.00	3,743.26	10.37	110.09	-115.36	110.73	479.55	2,116.14	2,086.40	29.75	71.136		
5,900.00	5,899.84	3,724.00	3,743.26	10.56	110.09	-113.70	110.73	479.55	2,213.50	2,184.86	28.64	77.291		
6,000.00	5,999.83	3,724.00	3,743.26	10.76	110.09	-112.97	110.73	479.55	2,311.19	2,283.54	27.66	83.562		
6,100.00	6,099.75	3,724.00	3,743.26	10.96	110.09	-110.65	110.73	479.55	2,409.27	2,382.45	26.82	89.835		
6,200.00	6,199.65	3,724.00	3,743.26	11.16	110.09	-114.14	110.73	479.55	2,507.57	2,481.50	26.07	96.172		
6,300.00	6,299.55	3,724.00	3,743.26	11.37	110.09	-113.02	110.73	479.55	2,606.01	2,580.61	25.39	102.623		
6,400.00	6,399.46	3,724.00	3,743.26	11.58	110.09	-115.35	110.73	479.55	2,704.55	2,679.79	24.77	109.189		
6,500.00	6,499.38	3,724.00	3,743.26	11.79	110.09	-115.74	110.73	479.55	2,803.18	2,778.99	24.19	115.895		
6,600.00	6,599.32	3,724.00	3,743.26	12.01	110.09	-114.95	110.73	479.55	2,901.86	2,878.22	23.64	122.748		
6,700.00	6,699.26	3,724.00	3,743.26	12.22	110.09	-111.20	110.73	479.55	3,000.59	2,977.46	23.13	129.733		
6,800.00	6,799.17	3,724.00	3,743.26	12.44	110.09	-113.67	110.73	479.55	3,099.47	3,076.79	22.68	136.673		
6,900.00	6,899.07	3,724.00	3,743.26	12.66	110.09	-114.18	110.73	479.55	3,198.47	3,176.19	22.28	143.580		
7,000.00	6,998.97	3,724.00	3,743.26	12.88	110.09	-116.14	110.73	479.55	3,297.52	3,275.61	21.90	150.543		
7,100.00	7,098.86	3,724.00	3,743.26	13.11	110.09	-121.57	110.73	479.55	3,396.67	3,375.10	21.57	157.460		
7,200.00	7,198.77	3,724.00	3,743.26	13.34	110.09	-119.13	110.73	479.55	3,495.87	3,474.60	21.26	164.418		
7,300.00	7,298.67	3,724.00	3,743.26	13.56	110.09	-102.20	110.73	479.55	3,595.04	3,574.08	20.96	171.488		
7,400.00	7,398.55	3,724.00	3,743.26	13.78	110.09	-103.73	110.73	479.55	3,694.20	3,673.52	20.68	178.629		
7,500.00	7,498.44	3,724.00	3,743.26	14.01	110.09	-116.33	110.73	479.55	3,793.47	3,773.04	20.43	185.665		
7,600.00	7,598.30	3,724.00	3,743.26	14.25	110.09	-111.37	110.73	479.55	3,892.87	3,872.64	20.23	192.445		
7,700.00	7,698.13	3,724.00	3,743.26	14.48	110.09	-115.01	110.73	479.55	3,992.32	3,972.27	20.05	199.114		
7,800.00	7,797.98	3,724.00	3,743.26	14.72	110.09	-117.43	110.73	479.55	4,091.80	4,071.91	19.89	205.764		
7,900.00	7,897.86	3,724.00	3,743.26	14.96	110.09	-118.86	110.73	479.55	4,191.27	4,171.54	19.72	212.504		
8,000.00	7,997.77	3,724.00	3,743.26	15.19	110.09	-121.07	110.73	479.55	4,290.70	4,271.15	19.56	219.411		
8,100.00	8,097.70	3,724.00	3,743.26	15.43	110.09	-123.97	110.73	479.55	4,390.16	4,370.76	19.40	226.316		
8,200.00	8,197.64	3,724.00	3,743.26	15.67	110.09	-119.88	110.73	479.55	4,489.63	4,470.37	19.25	233.197		
8,300.00	8,297.56	3,724.00	3,743.26	15.91	110.09	-108.16	110.73	479.55	4,589.09	4,569.98	19.12	240.075		
8,400.00	8,397.45	3,724.00	3,743.26	16.15	110.09	-100.94	110.73	479.55	4,688.57	4,669.57	19.00	246.811		
8,500.00	8,497.32	3,724.00	3,743.26	16.38	110.09	-99.06	110.73	479.55	4,788.07	4,769.18	18.89	253.451		
8,600.00	8,597.19	3,724.00	3,743.26	16.62	110.09	-97.58	110.73	479.55	4,887.57	4,868.78	18.79	260.053		
8,700.00	8,697.07	3,724.00	3,743.26	16.85	110.09	-96.03	110.73	479.55	4,987.08	4,968.37	18.70	266.643		
8,800.00	8,796.96	3,724.00	3,743.26	17.09	110.09	-100.16	110.73	479.55	5,086.58	5,067.97	18.62	273.226		
8,900.00	8,896.87	3,724.00	3,743.26	17.33	110.09	-119.79	110.73	479.55	5,186.15	5,167.61	18.54	279.670		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design Keohane A - 1 - OH - Assumed Surveys											Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset-Well											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)	Separation (usft)	Factor
9,000.00	8,996.80	3,724.00	3,743.26	17.57	110.09	-115.87	110.73	479.55	5,285.76	5,267.28	18.48	286.034
9,100.00	9,096.75	3,724.00	3,743.26	17.82	110.09	-140.05	110.73	479.55	5,385.38	5,366.95	18.42	292.344
9,200.00	9,196.70	3,724.00	3,743.26	18.06	110.09	-179.37	110.73	479.55	5,485.06	5,466.68	18.38	298.415
9,300.00	9,296.64	3,724.00	3,743.26	18.30	110.09	-167.67	110.73	479.55	5,584.80	5,566.44	18.36	304.257
9,400.00	9,396.58	3,724.00	3,743.26	18.54	110.09	-141.06	110.73	479.55	5,684.54	5,666.20	18.34	309.992
9,500.00	9,496.53	3,724.00	3,743.26	18.79	110.09	-137.43	110.73	479.55	5,784.23	5,765.92	18.31	315.878
9,600.00	9,596.47	3,724.00	3,743.26	19.03	110.09	-99.75	110.73	479.55	5,883.87	5,865.59	18.29	321.771
9,700.00	9,696.39	3,724.00	3,743.26	19.27	110.09	-102.86	110.73	479.55	5,983.50	5,965.24	18.26	327.646
9,800.00	9,796.32	3,724.00	3,743.26	19.51	110.09	-100.47	110.73	479.55	6,083.13	6,064.89	18.25	333.403
9,900.00	9,896.23	3,724.00	3,743.26	19.75	110.09	-101.41	110.73	479.55	6,182.80	6,164.56	18.24	338.947
10,000.00	9,996.15	3,724.00	3,743.26	20.00	110.09	-106.86	110.73	479.55	6,282.48	6,264.24	18.24	344.381
10,100.00	10,096.08	3,724.00	3,743.26	20.25	110.09	-127.66	110.73	479.55	6,382.20	6,363.94	18.25	349.670
10,200.00	10,196.03	3,724.00	3,743.26	20.49	110.09	-169.96	110.73	479.55	6,481.96	6,463.69	18.27	354.788
10,300.00	10,296.00	3,724.00	3,743.26	20.71	110.09	140.11	110.73	479.55	6,581.71	6,563.42	18.29	359.929
10,400.00	10,395.97	3,724.00	3,743.26	20.89	110.09	103.17	110.73	479.55	6,681.39	6,663.10	18.29	365.279
10,500.00	10,495.95	3,724.00	3,743.26	21.01	110.09	81.80	110.73	479.55	6,780.99	6,762.70	18.29	370.846
10,600.00	10,595.94	3,724.00	3,743.26	21.08	110.09	99.18	110.73	479.55	6,880.58	6,852.98	27.60	249.308
10,700.00	10,695.83	3,724.00	3,743.26	21.11	110.09	23.97	110.73	479.55	6,979.77	6,948.50	31.26	223.254
10,800.00	10,791.50	3,724.00	3,743.26	21.12	110.09	10.62	110.73	479.55	7,074.32	7,043.05	31.27	226.232
10,900.00	10,880.02	3,724.00	3,743.26	21.16	110.09	7.94	110.73	479.55	7,161.01	7,129.85	31.16	229.830
11,000.00	10,958.70	3,724.00	3,743.26	21.24	110.09	6.37	110.73	479.55	7,238.16	7,207.09	31.07	232.980
11,100.00	11,026.51	3,724.00	3,743.26	21.37	110.09	5.62	110.73	479.55	7,304.92	7,273.87	31.05	235.287
11,200.00	11,083.86	3,724.00	3,743.26	21.58	110.09	5.07	110.73	479.55	7,362.05	7,330.88	31.17	236.166
11,300.00	11,126.68	3,724.00	3,743.26	21.87	110.09	4.67	110.73	479.55	7,405.80	7,374.30	31.50	235.132
11,400.00	11,154.67	3,724.00	3,743.26	22.26	110.09	4.50	110.73	479.55	7,435.89	7,403.87	32.02	232.204
11,500.00	11,166.33	3,724.00	3,743.26	22.74	110.09	4.41	110.73	479.55	7,450.79	7,418.07	32.73	227.656
11,600.00	11,169.52	3,724.00	3,743.26	23.29	110.09	4.41	110.73	479.55	7,458.57	7,424.94	33.63	221.796
11,700.00	11,170.81	3,724.00	3,743.26	23.93	110.09	4.31	110.73	479.55	7,465.89	7,431.18	34.71	215.090
11,800.00	11,170.08	3,724.00	3,743.26	24.63	110.09	4.27	110.73	479.55	7,472.65	7,436.70	35.94	207.908
11,900.00	11,168.76	3,724.00	3,743.26	25.39	110.09	4.16	110.73	479.55	7,480.29	7,443.00	37.29	200.571
12,000.00	11,167.38	3,724.00	3,743.26	26.22	110.09	4.16	110.73	479.55	7,489.27	7,450.53	38.74	193.338
12,100.00	11,166.10	3,724.00	3,743.26	27.09	110.09	4.20	110.73	479.55	7,499.65	7,459.41	40.24	186.370
12,200.00	11,164.16	3,724.00	3,743.26	28.02	110.09	4.14	110.73	479.55	7,510.65	7,468.86	41.79	179.704
12,300.00	11,163.16	3,724.00	3,743.26	28.98	110.09	3.97	110.73	479.55	7,524.07	7,480.67	43.40	173.346
12,400.00	11,160.99	3,724.00	3,743.26	29.99	110.09	3.96	110.73	479.55	7,537.69	7,492.63	45.05	167.305
12,500.00	11,158.27	3,724.00	3,743.26	31.03	110.09	3.96	110.73	479.55	7,552.05	7,505.32	46.73	161.613
12,600.00	11,155.45	3,724.00	3,743.26	32.11	110.09	4.02	110.73	479.55	7,567.60	7,519.18	48.43	156.270
12,700.00	11,152.55	3,724.00	3,743.26	33.21	110.09	4.09	110.73	479.55	7,584.31	7,534.17	50.14	151.269
12,800.00	11,149.73	3,724.00	3,743.26	34.34	110.09	4.20	110.73	479.55	7,602.33	7,550.47	51.86	146.591
12,900.00	11,147.73	3,724.00	3,743.26	35.49	110.09	4.27	110.73	479.55	7,622.36	7,568.77	53.59	142.234
13,000.00	11,146.16	3,724.00	3,743.26	36.66	110.09	4.46	110.73	479.55	7,644.01	7,588.68	55.32	138.171
13,100.00	11,143.37	3,724.00	3,743.26	37.84	110.09	4.53	110.73	479.55	7,665.63	7,608.57	57.06	134.347
13,200.00	11,141.36	3,724.00	3,743.26	39.04	110.09	4.23	110.73	479.55	7,689.30	7,630.50	58.80	130.771
13,300.00	11,140.35	3,724.00	3,743.26	40.27	110.09	4.24	110.73	479.55	7,715.24	7,654.70	60.54	127.436
13,400.00	11,139.55	3,724.00	3,743.26	41.50	110.09	4.35	110.73	479.55	7,742.56	7,680.28	62.28	124.318
13,500.00	11,139.16	3,724.00	3,743.26	42.75	110.09	4.45	110.73	479.55	7,771.42	7,707.41	64.01	121.409
13,600.00	11,138.10	3,724.00	3,743.26	44.01	110.09	4.20	110.73	479.55	7,800.85	7,735.11	65.74	118.666
13,700.00	11,136.36	3,724.00	3,743.26	45.28	110.09	4.35	110.73	479.55	7,830.82	7,763.36	67.46	116.080
13,800.00	11,134.44	3,724.00	3,743.26	46.56	110.09	4.43	110.73	479.55	7,861.70	7,792.53	69.17	113.654
13,900.00	11,131.99	3,724.00	3,743.26	47.85	110.09	4.14	110.73	479.55	7,893.31	7,822.43	70.88	111.364
14,000.00	11,129.35	3,724.00	3,743.26	49.15	110.09	4.33	110.73	479.55	7,925.88	7,853.30	72.57	109.211
14,100.00	11,127.30	3,724.00	3,743.26	50.46	110.09	4.24	110.73	479.55	7,960.06	7,885.81	74.25	107.202

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

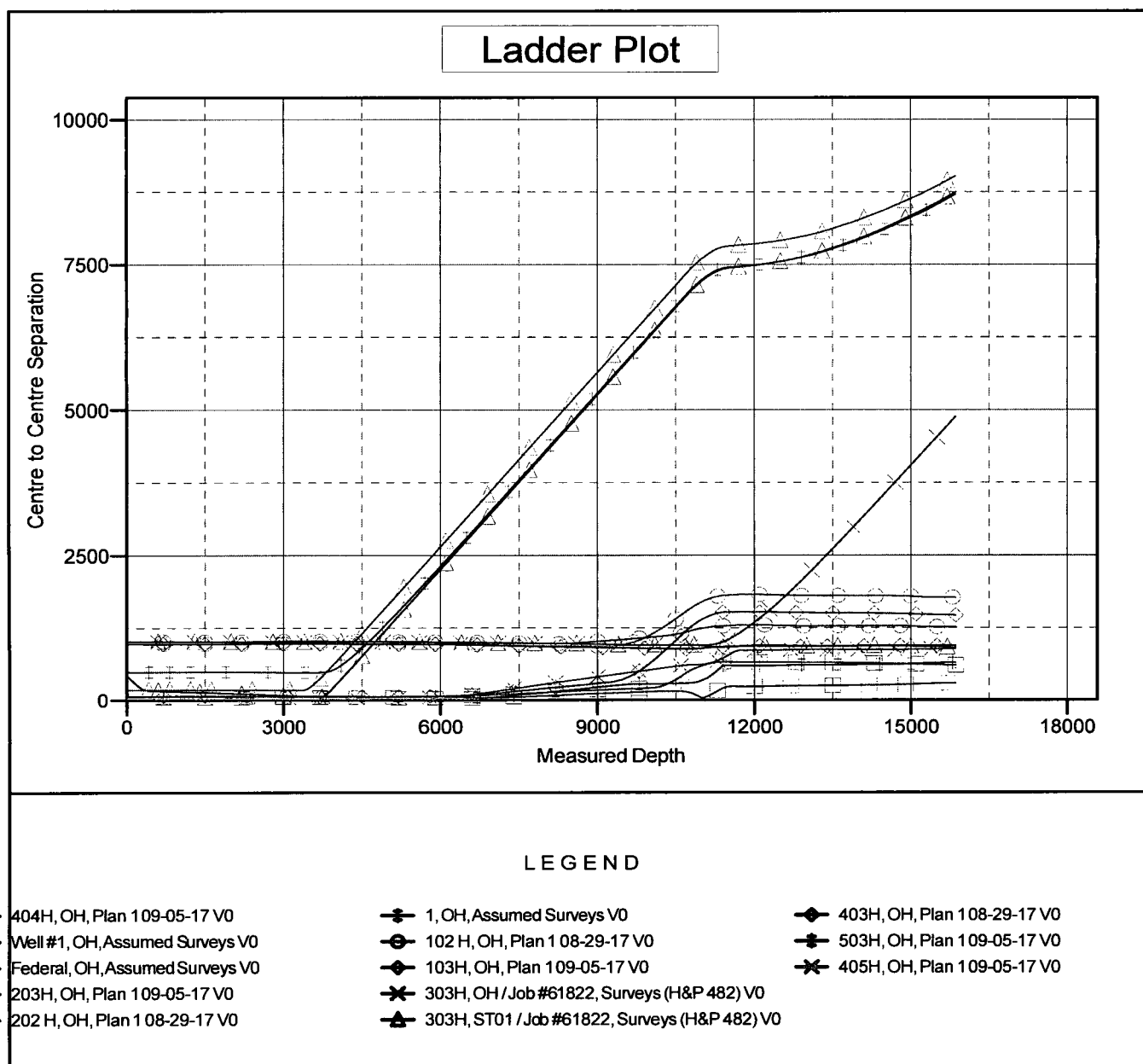
Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Offset Design											Keohane A - 1 - OH - Assumed Surveys		Offset Site Error: 0.00 usft	
Survey Program: 100-INC-ONLY-Offset Well											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)				
14,200.00	11,125.53	3,724.00	3,743.26	51.78	110.09	4.15	110.73	479.55	7,995.71	7,919.79	75.92	105.319		
14,300.00	11,123.66	3,724.00	3,743.26	53.10	110.09	4.49	110.73	479.55	8,032.28	7,954.71	77.57	103.551		
14,400.00	11,121.94	3,724.00	3,743.26	54.42	110.09	4.74	110.73	479.55	8,069.98	7,990.78	79.20	101.895		
14,500.00	11,120.47	3,724.00	3,743.26	55.75	110.09	4.57	110.73	479.55	8,108.93	8,028.12	80.81	100.344		
14,600.00	11,118.28	3,724.00	3,743.26	57.09	110.09	4.41	110.73	479.55	8,148.34	8,065.93	82.41	98.874		
14,700.00	11,115.63	3,724.00	3,743.26	58.43	110.09	4.40	110.73	479.55	8,188.37	8,104.37	84.00	97.485		
14,800.00	11,113.90	3,724.00	3,743.26	59.78	110.09	4.41	110.73	479.55	8,230.27	8,144.71	85.56	96.194		
14,900.00	11,112.44	3,724.00	3,743.26	61.13	110.09	3.79	110.73	479.55	8,273.46	8,186.36	87.10	94.986		
15,000.00	11,107.78	3,724.00	3,743.26	62.49	110.09	3.31	110.73	479.55	8,314.87	8,226.22	88.64	93.801		
15,100.00	11,100.29	3,724.00	3,743.26	63.86	110.09	3.25	110.73	479.55	8,354.73	8,264.55	90.18	92.645		
15,200.00	11,093.78	3,724.00	3,743.26	65.23	110.09	3.77	110.73	479.55	8,396.45	8,304.76	91.69	91.570		
15,300.00	11,090.64	3,724.00	3,743.26	66.60	110.09	4.06	110.73	479.55	8,442.10	8,348.93	93.17	90.610		
15,400.00	11,088.46	3,724.00	3,743.26	67.97	110.09	4.41	110.73	479.55	8,489.47	8,394.85	94.62	89.724		
15,500.00	11,085.18	3,724.00	3,743.26	69.34	110.09	4.63	110.73	479.55	8,536.69	8,440.64	96.05	88.880		
15,600.00	11,082.81	3,724.00	3,743.26	70.72	110.09	4.13	110.73	479.55	8,585.68	8,488.22	97.45	88.100		
15,700.00	11,080.37	3,724.00	3,743.26	72.10	110.09	4.26	110.73	479.55	8,635.52	8,536.68	98.84	87.369		
15,800.00	11,077.84	3,724.00	3,743.26	73.48	110.09	4.64	110.73	479.55	8,686.09	8,585.89	100.20	86.685		
15,859.00	11,076.45	3,724.00	3,743.26	74.30	110.09	4.64	110.73	479.55	8,716.39	8,615.40	101.00	86.304		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 305H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3740.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	KB @ 3740.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	305H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / 62390	Database:	USA Compass
Reference Design:	Surveys (H&P 482)	Offset TVD Reference:	Reference Datum

Reference Depths are relative to KB @ 3740.00usft (H&P 482)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 305H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.42°



Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 305H
Well Error: 0.00 usft
Reference Wellbore: OH / 62390
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well 305H
TVD Reference: KB @ 3740.00usft (H&P 482)
MD Reference: KB @ 3740.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Reference Depths are relative to KB @ 3740.00usft (H&P 482)

Offset Depths are relative to Offset Datum

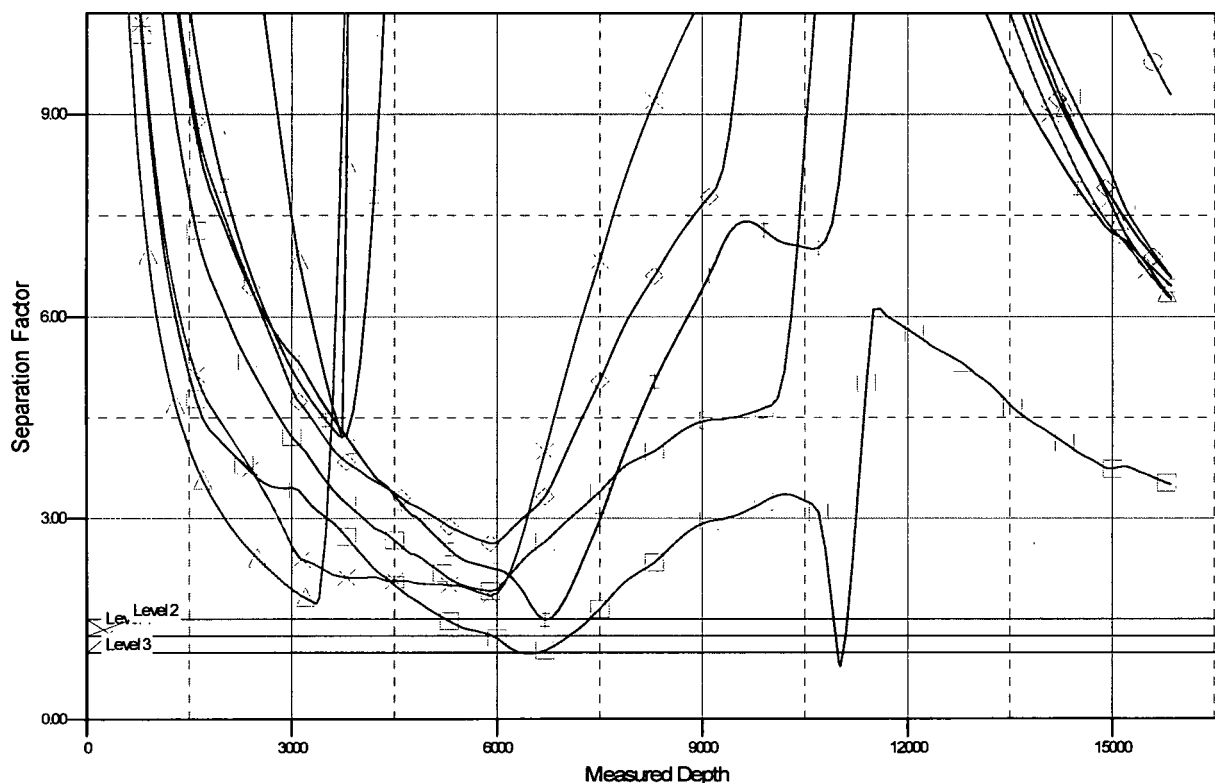
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 305H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.42°

Separation Factor Plot



LEGEND

- 404H, OH, Plan 109-05-17 V0
- Well #1, OH, Assumed Surveys V0
- Federal, OH, Assumed Surveys V0
- 203H, OH, Plan 109-05-17 V0
- 202 H, OH, Plan 108-29-17 V0
- ◆ 1, OH, Assumed Surveys V0
- ⊙ 102 H, OH, Plan 108-29-17 V0
- ◆ 103H, OH, Plan 109-05-17 V0
- ✕ 303H, OH / Job #61822, Surveys (H&P 482) V0
- ▲ 303H, ST01 / Job #61822, Surveys (H&P 482) V0
- ◆ 403H, OH, Plan 108-29-17 V0
- ◆ 503H, OH, Plan 109-05-17 V0
- ✕ 405H, OH, Plan 109-05-17 V0