



EXPLORING WHAT'S POSSIBLE

15-43443

Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal COM →

#46H

*Cedar Lake Federal CA
#646H*

OH / Job #1514748

Survey: Phoenix MWD Surveys NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 06 2016

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Anticollision Report

20 December, 2015



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Reference	Survey: Phoenix MWD Surveys		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 2,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Program		Date	12/20/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
98.89	4,167.89	Scientific Gyro Surveys (OH / Job #151474	CB-GYRO-MS	Camera based gyro multishot	
4,225.00	9,827.00	Phoenix MWD Surveys (OH / Job #151474	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

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						
JL Keel B Federal						
40 - OH - Surveys	0.00	1.00	330.10			
40 - OH - Surveys	200.00	201.00	331.66	329.01	125.391	ES
40 - OH - Surveys	3,500.00	3,499.90	396.78	353.72	9.214	SF
NFE Federal COM						
#48H - OH - Plan #3 11-18-15	0.00	4.00	65.00			
#48H - OH - Plan #3 11-18-15	4,532.08	4,520.96	92.88	39.67	1.746	ES, SF
#50H - OH - Plan #2 11-18-15	0.00	8.00	130.00			
#50H - OH - Plan #2 11-18-15	4,533.59	4,526.25	157.87	104.64	2.966	ES, SF

Offset Design												JL Keel B Federal - 40 - OH - Surveys		Offset Site Error: 0.00 usft	
Survey Program: 515-CB-GYRO-SS												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	1.00	0.00	0.00	89.69	1.79	330.09	330.10						
98.89	98.89	99.89	99.89	0.67	0.46	-135.62	1.71	330.09	330.49	329.48	1.01	327.491			
100.00	100.00	101.00	101.00	0.59	0.46	-135.72	1.71	330.09	330.49	329.47	1.03	321.725			
200.00	199.99	201.00	201.00	1.72	0.92	-140.64	1.45	330.09	331.66	329.01	2.64	125.391	ES		
300.00	299.96	300.98	300.98	2.87	1.38	-142.67	1.03	330.09	333.56	329.30	4.26	78.365			
336.89	336.83	337.86	337.85	3.29	1.55	-143.18	0.83	330.09	334.45	329.60	4.85	68.952			
400.00	399.89	400.93	400.93	3.80	1.84	-139.77	0.43	330.09	336.40	330.74	5.66	59.397			
425.89	425.74	426.79	426.79	4.01	1.96	-139.01	0.25	330.09	337.40	331.40	6.00	56.257			
500.00	499.73	500.81	500.81	4.64	2.30	-135.81	-0.33	330.09	340.52	333.56	6.96	48.929			
514.89	514.59	515.68	515.67	4.76	2.37	-135.27	-0.46	330.09	341.17	334.02	7.15	47.692			
556.89	556.51	557.62	557.61	5.10	2.62	-137.39	-0.84	330.09	343.05	335.31	7.74	44.334			
600.00	599.54	600.68	600.67	5.48	2.88	-139.40	-1.27	330.09	344.97	336.61	8.37	41.221			
684.89	684.30	685.49	685.47	6.23	3.39	-143.91	-2.20	330.09	348.63	339.01	9.61	36.269			
700.00	699.39	700.59	700.57	6.36	3.48	-142.75	-2.38	330.09	349.25	339.42	9.83	35.531			
769.89	769.20	770.43	770.41	6.96	3.89	-136.93	-3.27	330.09	351.89	341.05	10.84	32.476			
800.00	799.27	800.53	800.50	7.22	4.07	-138.55	-3.68	330.09	352.93	341.66	11.27	31.311			
854.89	854.10	855.39	855.36	7.70	4.40	-141.70	-4.47	330.09	354.83	342.76	12.07	29.403			
900.00	899.17	900.49	900.45	8.09	4.67	-141.40	-5.15	330.09	356.35	343.62	12.73	27.991			

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



Phoenix Technology Services

Anticollision Report



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Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design JL Keel B Federal - 40 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 515-CB-GYRO-SS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation (usft)	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)		
940.89	940.02	941.37	941.33	8.46	4.91	-141.10	-5.81 330.09	357.69	344.36	13.33	26.828			
1,000.00	999.08	1,000.47	1,000.42	8.99	5.26	-140.57	-6.81 330.09	359.57	345.36	14.21	25.306			
1,025.89	1,024.95	1,026.35	1,026.29	9.22	5.38	-140.33	-7.26 330.09	360.38	345.83	14.55	24.766			
1,100.00	1,099.00	1,100.43	1,100.37	9.87	5.70	-144.84	-8.60 330.09	362.65	347.13	15.52	23.362			
1,110.89	1,109.88	1,111.32	1,111.25	9.97	5.74	-145.56	-8.80 330.09	362.98	347.32	15.67	23.170			
1,195.89	1,194.83	1,196.30	1,196.22	10.73	6.11	-145.71	-10.40 330.09	365.34	348.55	16.79	21.763			
1,200.00	1,198.94	1,200.41	1,200.33	10.77	6.13	-146.79	-10.48 330.09	365.44	348.60	16.84	21.700			
1,281.89	1,280.79	1,282.28	1,282.18	11.49	6.48	-169.50	-12.08 330.09	367.67	349.75	17.92	20.522			
1,300.00	1,298.89	1,300.39	1,300.29	11.65	6.56	-163.22	-12.44 330.09	368.18	350.03	18.15	20.285			
1,366.89	1,365.75	1,367.27	1,367.15	12.23	6.85	-138.55	-13.81 330.09	369.81	350.79	19.02	19.446			
1,400.00	1,398.85	1,400.38	1,400.25	12.52	7.00	-145.07	-14.50 330.09	370.51	351.07	19.45	19.052			
1,500.00	1,498.81	1,500.36	1,500.21	13.39	7.41	-169.67	-16.64 330.09	372.74	352.01	20.73	17.980			
1,536.89	1,535.69	1,537.22	1,537.07	13.71	7.47	-179.64	-17.43 330.09	373.59	352.48	21.11	17.695			
1,600.00	1,598.79	1,600.29	1,600.12	14.27	7.58	-150.42	-18.73 330.09	374.93	353.16	21.77	17.224			
1,621.89	1,620.67	1,622.17	1,622.00	14.46	7.62	-140.33	-19.16 330.09	375.32	353.33	21.99	17.064			
1,700.00	1,698.76	1,700.25	1,700.06	15.17	7.75	-137.50	-20.65 330.09	376.61	353.78	22.84	16.492			
1,792.89	1,791.63	1,793.10	1,792.90	16.02	7.90	-133.82	-22.28 330.09	378.01	354.17	23.84	15.858			
1,800.00	1,798.74	1,800.21	1,800.01	16.08	7.92	-133.39	-22.40 330.09	378.11	354.19	23.91	15.812			
1,877.89	1,876.61	1,878.07	1,877.86	16.78	8.05	-128.62	-23.65 330.09	379.14	354.40	24.74	15.323			
1,900.00	1,898.71	1,900.17	1,899.96	16.98	8.09	-133.43	-23.99 330.09	379.43	354.45	24.97	15.193			
1,962.89	1,961.59	1,963.04	1,962.82	17.53	8.19	-148.50	-24.90 330.09	380.35	354.71	25.63	14.838			
2,000.00	1,998.89	2,000.14	1,999.91	17.86	8.25	-149.20	-25.41 330.09	380.94	354.92	26.03	14.636			
2,047.89	2,046.57	2,048.02	2,047.79	18.29	8.34	-150.08	-26.05 330.09	381.73	355.19	26.55	14.379			
2,100.00	2,098.67	2,100.13	2,099.89	18.76	8.45	-150.21	-26.76 330.09	382.60	355.48	27.12	14.110			
2,200.00	2,198.66	2,200.13	2,199.88	19.65	8.65	-150.48	-28.18 330.09	384.21	356.01	28.20	13.622			
2,217.89	2,216.54	2,218.02	2,217.77	19.81	8.69	-150.52	-28.45 330.09	384.50	356.10	28.40	13.539			
2,300.00	2,298.64	2,300.13	2,299.87	20.55	8.85	-154.07	-29.70 330.09	385.70	356.40	29.30	13.163			
2,302.89	2,301.53	2,303.02	2,302.76	20.57	8.86	-154.22	-29.75 330.09	385.74	356.40	29.33	13.150			
2,387.89	2,386.52	2,388.02	2,387.75	21.34	9.03	-158.98	-31.11 330.09	386.79	356.53	30.27	12.780			
2,400.00	2,398.63	2,400.13	2,399.86	21.44	9.06	-160.79	-31.31 330.09	386.93	356.53	30.40	12.728			
2,473.89	2,472.52	2,474.01	2,473.74	22.10	9.20	-177.70	-32.56 330.09	387.63	356.42	31.21	12.421			
2,500.00	2,498.63	2,500.12	2,499.84	22.33	9.26	-177.09	-33.01 330.09	387.83	356.34	31.49	12.316			
2,558.89	2,557.51	2,559.00	2,558.70	22.85	9.39	-164.51	-34.02 330.09	388.28	356.13	32.14	12.079			
2,600.00	2,598.62	2,600.09	2,599.80	23.21	9.48	-162.11	-34.72 330.09	388.59	355.99	32.60	11.921			
2,643.89	2,642.51	2,643.97	2,643.67	23.60	9.58	-160.08	-35.44 330.09	388.96	355.88	33.08	11.758			
2,700.00	2,698.62	2,700.06	2,699.75	24.08	9.71	-149.35	-36.35 330.09	389.45	355.75	33.70	11.558			
2,728.89	2,727.51	2,728.94	2,728.63	24.33	9.78	-143.96	-36.80 330.09	389.68	355.67	34.01	11.457			
2,800.00	2,798.61	2,800.03	2,799.71	24.95	9.94	-150.78	-37.90 330.09	390.30	355.51	34.79	11.220			
2,813.89	2,812.50	2,813.92	2,813.59	25.07	9.97	-151.95	-38.11 330.09	390.44	355.50	34.94	11.175			
2,898.89	2,897.50	2,898.89	2,898.56	25.80	10.16	-134.68	-39.36 330.09	391.19	355.33	35.86	10.909			
2,900.00	2,898.61	2,900.00	2,899.67	25.81	10.17	-134.85	-39.38 330.09	391.20	355.33	35.87	10.905			
2,983.89	2,982.49	2,983.87	2,983.52	26.52	10.36	-147.86	-40.56 330.09	391.92	355.14	36.78	10.655			
3,000.00	2,998.60	2,999.97	2,999.63	26.66	10.39	-147.17	-40.78 330.09	392.07	355.11	36.96	10.608			
3,068.89	3,067.49	3,068.85	3,068.50	27.26	10.55	-143.99	-41.71 330.09	392.68	354.97	37.71	10.413			
3,100.00	3,098.59	3,099.95	3,099.60	27.53	10.66	-142.27	-42.11 330.09	392.94	354.84	38.09	10.316			
3,153.89	3,152.48	3,153.83	3,153.47	28.00	10.86	-139.10	-42.75 330.09	393.36	354.59	38.76	10.147			
3,200.00	3,198.59	3,199.93	3,199.57	28.40	11.04	-140.14	-43.26 330.09	393.73	354.39	39.34	10.009			
3,239.89	3,238.48	3,239.81	3,239.45	28.75	11.19	-140.90	-43.66 330.09	394.08	354.25	39.83	9.894			
3,300.00	3,298.58	3,299.92	3,299.55	29.26	11.41	-127.75	-44.21 330.09	394.58	354.01	40.57	9.725			
3,324.89	3,323.47	3,324.80	3,324.44	29.48	11.50	-122.50	-44.41 330.09	394.76	353.88	40.88	9.656			
3,400.00	3,398.57	3,399.91	3,399.54	30.13	11.79	-154.68	-44.95 330.09	395.48	353.67	41.81	9.458			
3,409.89	3,408.46	3,409.80	3,409.43	30.21	11.82	-158.11	-45.01 330.09	395.61	353.67	41.94	9.434			

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



Phoenix Technology Services

Anticollision Report



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Offset Design													JL Keel B Federal - 40 - OH - Surveys		Offset Site Error: 0.00 usft	
Survey Program: 515-CB-GYRO-SS													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)						
3,494.89	3,493.45	3,494.80	3,494.43	30.96	12.14	153.42	-45.47	330.09	396.71	353.72	43.00	9.226				
3,500.00	3,498.56	3,499.90	3,499.54	31.00	12.16	153.67	-45.49	330.09	396.78	353.72	43.06	9.214 SF				
3,579.89	3,578.45	3,500.00	3,499.63	31.71	12.16	158.60	-45.49	330.09	405.61	361.85	43.76	9.268				
3,600.00	3,598.56	3,500.00	3,499.63	31.89	12.16	157.68	-45.49	330.09	410.24	366.30	43.94	9.336				
3,664.89	3,663.44	3,500.00	3,499.63	32.46	12.16	154.87	-45.49	330.09	431.29	386.78	44.51	9.690				
3,700.00	3,698.55	3,500.00	3,499.63	32.77	12.16	158.61	-45.49	330.09	446.20	401.38	44.82	9.956				
3,749.89	3,748.44	3,500.00	3,499.63	33.20	12.16	165.50	-45.49	330.09	471.06	425.80	45.26	10.408				
3,800.00	3,798.55	3,500.00	3,499.63	33.65	12.16	171.62	-45.49	330.09	499.76	454.06	45.70	10.935				
3,834.89	3,833.43	3,500.00	3,499.63	33.96	12.16	177.05	-45.49	330.09	521.65	475.63	46.02	11.336				
3,900.00	3,898.54	3,500.00	3,499.63	34.54	12.16	163.24	-45.49	330.09	565.94	519.34	46.59	12.147				
3,919.89	3,918.43	3,500.00	3,499.63	34.72	12.16	158.32	-45.49	330.09	580.24	533.47	46.77	12.407				
4,000.00	3,998.54	3,500.00	3,499.63	35.44	12.16	156.62	-45.49	330.09	640.86	593.37	47.49	13.496				
4,089.89	4,088.43	3,500.00	3,499.63	36.24	12.16	154.53	-45.49	330.09	713.45	665.16	48.29	14.774				
4,100.00	4,098.54	3,500.00	3,499.63	36.33	12.16	155.64	-45.49	330.09	721.86	673.48	48.38	14.921				
4,167.89	4,166.43	3,500.00	3,499.63	36.93	12.16	162.94	-45.49	330.09	779.38	730.40	48.98	15.912				
4,200.00	4,198.54	3,500.00	3,499.63	37.07	12.16	172.13	-45.49	330.09	807.14	758.02	49.12	16.432				
4,225.00	4,223.54	3,500.00	3,499.63	37.18	12.16	179.75	-45.49	330.09	828.98	779.75	49.23	16.838				
4,268.00	4,266.53	3,500.00	3,499.63	37.18	12.16	9.48	-45.49	330.09	866.55	817.37	49.18	17.619				
4,300.00	4,298.46	3,500.00	3,499.63	37.18	12.16	10.15	-45.49	330.09	894.10	845.13	48.97	18.258				
4,310.00	4,308.41	3,500.00	3,499.63	37.18	12.16	10.00	-45.49	330.09	902.57	853.70	48.87	18.468				
4,353.00	4,350.91	3,500.00	3,499.63	37.19	12.16	8.62	-45.49	330.09	938.21	890.00	48.21	19.461				
4,395.00	4,391.74	3,500.00	3,499.63	37.19	12.16	6.85	-45.49	330.09	971.64	924.41	47.24	20.570				
4,400.00	4,396.55	3,500.00	3,499.63	37.19	12.16	6.73	-45.49	330.09	975.53	928.44	47.09	20.715				
4,438.00	4,432.56	3,500.00	3,499.63	37.19	12.16	5.96	-45.49	330.09	1,004.34	958.48	45.86	21.902				
4,481.00	4,472.05	3,500.00	3,499.63	37.20	12.16	4.38	-45.49	330.09	1,035.35	991.19	44.16	23.445				
4,500.00	4,489.02	3,500.00	3,499.63	37.21	12.16	3.34	-45.49	330.09	1,048.52	1,005.15	43.37	24.178				
4,523.00	4,509.15	3,500.00	3,499.63	37.22	12.16	2.35	-45.49	330.09	1,064.03	1,021.71	42.32	25.141				
4,566.00	4,545.45	3,500.00	3,499.63	37.24	12.16	0.15	-45.49	330.09	1,091.82	1,051.53	40.29	27.097				
4,600.00	4,572.72	3,500.00	3,499.63	37.26	12.16	-0.80	-45.49	330.09	1,112.53	1,074.34	38.19	29.130				
4,608.00	4,578.92	3,500.00	3,499.63	37.27	12.16	-0.98	-45.49	330.09	1,117.22	1,079.56	37.66	29.662				
4,651.00	4,610.56	3,500.00	3,499.63	37.31	12.16	-1.36	-45.49	330.09	1,140.99	1,106.67	34.32	33.244				
4,694.00	4,639.01	3,500.00	3,499.63	37.37	12.16	-1.23	-45.49	330.09	1,162.13	1,131.70	30.43	38.186				
4,700.00	4,642.70	3,500.00	3,499.63	37.38	12.16	-1.18	-45.49	330.09	1,164.86	1,135.00	29.86	39.011				
4,736.00	4,663.33	3,500.00	3,499.63	37.46	12.16	-0.92	-45.49	330.09	1,180.05	1,153.76	26.29	44.883				
4,779.00	4,684.73	3,500.00	3,499.63	37.58	12.16	-0.33	-45.49	330.09	1,195.87	1,173.30	22.56	52.999				
4,800.00	4,694.04	3,500.00	3,499.63	37.66	12.16	-0.11	-45.49	330.09	1,202.86	1,181.78	21.08	57.067				
4,821.00	4,702.68	3,500.00	3,499.63	37.73	12.16	0.06	-45.49	330.09	1,209.49	1,189.93	19.56	61.823				
4,864.00	4,718.51	3,500.00	3,499.63	37.93	12.16	0.12	-45.49	330.09	1,222.16	1,205.15	17.01	71.860				
4,900.00	4,729.77	3,500.00	3,499.63	38.13	12.16	0.15	-45.49	330.09	1,231.80	1,217.31	14.49	84.995				
4,906.00	4,731.45	3,500.00	3,499.63	38.16	12.16	0.15	-45.49	330.09	1,233.31	1,219.23	14.08	87.617				
4,949.00	4,741.19	3,500.00	3,499.63	38.43	12.16	0.15	-45.49	330.09	1,242.59	1,232.72	9.86	126.010				
4,991.00	4,747.73	3,500.00	3,499.63	38.74	12.16	0.15	-45.49	330.09	1,250.05	1,241.72	8.33	150.150				
5,000.00	4,748.90	3,500.00	3,499.63	38.82	12.16	0.16	-45.49	330.09	1,251.60	1,243.50	8.10	154.444				
5,036.00	4,752.94	3,500.00	3,499.63	39.11	12.16	0.20	-45.49	330.09	1,257.79	1,250.46	7.33	171.598				
5,078.00	4,756.20	3,500.00	3,499.63	39.49	12.16	0.20	-45.49	330.09	1,264.83	1,258.22	6.61	191.335				
5,100.00	4,757.41	3,500.00	3,499.63	39.71	12.16	0.20	-45.49	330.09	1,268.57	1,261.89	6.68	189.829				
5,121.00	4,758.48	3,500.00	3,499.63	39.91	12.16	0.21	-45.49	330.09	1,272.40	1,265.64	6.76	188.191				
5,200.00	4,762.13	3,500.00	3,499.63	40.81	12.16	0.26	-45.49	330.09	1,289.40	1,282.15	7.26	177.690				
5,248.00	4,764.13	3,500.00	3,499.63	41.35	12.16	0.31	-45.49	330.09	1,301.76	1,294.20	7.57	172.015				
5,300.00	4,766.13	3,500.00	3,499.63	42.05	12.16	0.35	-45.49	330.09	1,316.83	1,308.91	7.92	166.224				
5,376.00	4,768.71	3,500.00	3,499.63	43.07	12.16	0.42	-45.49	330.09	1,341.86	1,333.41	8.45	158.781				
5,400.00	4,769.47	3,500.00	3,499.63	43.44	12.16	0.49	-45.49	330.09	1,350.50	1,341.86	8.64	156.338				

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design JL Keel B Federal - 40 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 515-CB-GYRO-SS													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		
5,500.00	4,772.61	3,500.00	3,499.63	44.96	12.16	0.81	-45.49	330.09	1,390.38	1,380.95	9.43	147.498		
5,504.00	4,772.73	3,500.00	3,499.63	45.02	12.16	0.82	-45.49	330.09	1,392.10	1,382.64	9.46	147.184		
5,600.00	4,775.31	3,500.00	3,499.63	46.64	12.16	0.82	-45.49	330.09	1,435.72	1,425.59	10.14	141.618		
5,631.00	4,775.95	3,500.00	3,499.63	47.17	12.16	0.81	-45.49	330.09	1,450.72	1,440.36	10.36	140.002		
5,700.00	4,777.14	3,500.00	3,499.63	48.43	12.16	0.44	-45.49	330.09	1,485.70	1,474.86	10.84	137.040		
5,759.00	4,777.96	3,500.00	3,499.63	49.51	12.16	0.10	-45.49	330.09	1,517.28	1,506.02	11.26	134.696		
5,800.00	4,778.39	3,500.00	3,499.63	50.30	12.16	-0.30	-45.49	330.09	1,540.07	1,528.51	11.57	133.164		
5,886.00	4,778.84	3,500.00	3,499.63	51.97	12.16	-1.21	-45.49	330.09	1,589.88	1,577.62	12.26	129.668		
5,900.00	4,778.85	3,500.00	3,499.63	52.26	12.16	-1.12	-45.49	330.09	1,598.22	1,585.86	12.36	129.276		
6,000.00	4,777.71	3,500.00	3,499.63	54.30	12.16	-0.43	-45.49	330.09	1,659.13	1,645.98	13.15	126.154		
6,014.00	4,777.39	3,500.00	3,499.63	54.58	12.16	-0.33	-45.49	330.09	1,667.83	1,654.56	13.27	125.678		
6,100.00	4,775.64	3,500.00	3,499.63	56.42	12.16	0.47	-45.49	330.09	1,722.99	1,709.06	13.93	123.682		
6,142.00	4,775.05	3,500.00	3,499.63	57.32	12.16	0.89	-45.49	330.09	1,751.02	1,736.74	14.28	122.581		
6,200.00	4,774.48	3,500.00	3,499.63	58.60	12.16	1.03	-45.49	330.09	1,790.81	1,776.07	14.74	121.476		
6,269.00	4,774.16	3,500.00	3,499.63	60.14	12.16	1.20	-45.49	330.09	1,839.66	1,824.36	15.30	120.274		
6,300.00	4,774.16	3,500.00	3,499.63	60.84	12.16	0.62	-45.49	330.09	1,862.12	1,846.65	15.47	120.381		
6,397.00	4,774.83	3,500.00	3,499.63	63.06	12.16	-1.32	-45.49	330.09	1,934.37	1,918.11	16.25	119.002		
6,400.00	4,774.87	3,500.00	3,499.63	63.13	12.16	-1.35	-45.49	330.09	1,936.65	1,920.36	16.28	118.937		

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 #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #48H - OH - Plan.#3 11-18-15														Offset Site Error:	0.00 usft
Survey Program: 0-PHX-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			
0.00	0.00	4.00	4.00	0.00	0.01	-0.18	65.00	-0.20	65.00						
98.89	98.89	102.89	102.89	0.57	0.17	134.90	65.00	-0.20	65.38	64.66	0.72	90.400			
100.00	100.00	104.00	104.00	0.59	0.17	134.81	65.00	-0.20	65.39	64.65	0.74	88.341			
200.00	199.99	203.99	203.99	1.72	0.53	131.01	65.00	-0.20	66.43	64.18	2.25	29.471			
300.00	299.96	303.96	303.96	2.87	0.89	130.72	65.00	-0.20	68.01	64.25	3.76	18.075			
336.89	336.83	340.83	340.83	3.29	1.02	131.00	65.00	-0.20	68.74	64.43	4.32	15.916			
400.00	399.89	403.89	403.89	3.80	1.25	136.06	65.00	-0.20	70.49	65.41	5.07	13.893			
425.89	425.74	429.74	429.74	4.01	1.34	137.65	65.00	-0.20	71.45	66.07	5.38	13.271			
500.00	499.73	503.73	503.73	4.64	1.61	143.33	65.00	-0.20	74.75	68.47	6.28	11.903			
514.89	514.59	518.59	518.59	4.76	1.66	144.37	65.00	-0.20	75.49	69.03	6.46	11.686			
556.89	556.51	560.51	560.51	5.10	1.81	143.63	65.00	-0.20	77.59	70.66	6.94	11.183			
600.00	599.54	603.54	603.54	5.48	1.96	142.98	65.00	-0.20	79.68	72.22	7.46	10.677			
684.89	684.30	688.30	688.30	6.23	2.27	140.85	65.00	-0.20	83.39	74.90	8.50	9.816			
700.00	699.39	703.39	703.39	6.36	2.32	142.39	65.00	-0.20	84.01	75.33	8.68	9.681			
769.89	769.20	773.20	773.20	6.96	2.57	149.75	65.00	-0.20	86.90	77.38	9.52	9.128			
800.00	799.27	803.27	803.27	7.22	2.68	148.71	65.00	-0.20	88.14	78.26	9.88	8.919			
854.89	854.10	858.10	858.10	7.70	2.88	146.56	65.00	-0.20	90.27	79.73	10.54	8.562			
900.00	899.17	903.17	903.17	8.09	3.04	147.63	65.00	-0.20	91.94	80.84	11.10	8.284			
940.89	940.02	944.02	944.02	8.46	3.19	148.59	65.00	-0.20	93.44	81.83	11.60	8.054			
1,000.00	999.08	1,003.08	1,003.08	8.99	3.40	149.98	65.00	-0.20	95.58	83.25	12.34	7.748			
1,025.89	1,024.95	1,028.95	1,028.95	9.22	3.49	150.58	65.00	-0.20	96.52	83.86	12.66	7.625			
1,100.00	1,099.00	1,103.00	1,103.00	9.87	3.75	147.04	65.00	-0.20	99.05	85.48	13.57	7.299			
1,110.89	1,109.88	1,113.88	1,113.88	9.97	3.79	146.46	65.00	-0.20	99.40	85.69	13.70	7.253			
1,195.89	1,194.83	1,198.83	1,198.83	10.73	4.10	147.25	65.00	-0.20	101.88	87.12	14.76	6.902			
1,200.00	1,198.94	1,202.94	1,202.94	10.77	4.11	146.21	65.00	-0.20	101.99	87.18	14.81	6.886			
1,281.89	1,280.79	1,284.79	1,284.79	11.49	4.41	124.38	65.00	-0.20	103.77	87.95	15.82	6.559			
1,300.00	1,298.89	1,302.89	1,302.89	11.65	4.47	130.87	65.00	-0.20	104.10	88.06	16.04	6.489			
1,366.89	1,365.75	1,369.75	1,369.75	12.23	4.71	156.09	65.00	-0.20	105.66	88.80	16.86	6.266			
1,400.00	1,398.85	1,402.85	1,402.85	12.52	4.83	149.79	65.00	-0.20	106.51	89.24	17.27	6.168			
1,500.00	1,498.81	1,502.81	1,502.81	13.39	5.19	125.92	65.00	-0.20	108.41	89.92	18.49	5.863			
1,536.89	1,535.69	1,539.69	1,539.69	13.71	5.32	116.26	65.00	-0.20	108.88	89.93	18.94	5.748			
1,600.00	1,598.79	1,602.79	1,602.79	14.27	5.55	145.90	65.00	-0.20	109.81	90.09	19.72	5.568			
1,621.89	1,620.67	1,624.67	1,624.67	14.46	5.63	156.09	65.00	-0.20	110.25	90.26	19.99	5.515			
1,700.00	1,698.76	1,702.76	1,702.76	15.17	5.90	159.24	65.00	-0.20	111.92	90.94	20.98	5.335			
1,792.89	1,791.63	1,795.63	1,795.63	16.02	6.24	163.22	65.00	-0.20	113.85	91.70	22.15	5.139			
1,800.00	1,798.74	1,802.74	1,802.74	16.08	6.26	163.67	65.00	-0.20	114.00	91.76	22.24	5.125			
1,877.89	1,876.61	1,880.61	1,880.61	16.78	6.54	168.64	65.00	-0.20	115.61	92.39	23.22	4.979			
1,900.00	1,898.71	1,902.71	1,902.71	16.98	6.62	163.88	65.00	-0.20	116.05	92.56	23.49	4.940			
1,962.89	1,961.59	1,965.59	1,965.59	17.53	6.85	149.03	65.00	-0.20	117.19	92.93	24.27	4.829			
2,000.00	1,998.69	2,002.69	2,002.69	17.86	6.98	148.50	65.00	-0.20	117.81	93.08	24.73	4.764			
2,047.89	2,046.57	2,050.57	2,050.57	18.29	7.15	147.84	65.00	-0.20	118.62	93.28	25.33	4.683			
2,100.00	2,098.67	2,102.67	2,102.67	18.76	7.34	147.93	65.00	-0.20	119.49	93.51	25.98	4.599			
2,200.00	2,198.66	2,202.66	2,202.66	19.65	7.70	148.09	65.00	-0.20	121.12	93.89	27.23	4.449			
2,217.89	2,216.54	2,220.54	2,220.54	19.81	7.76	148.11	65.00	-0.20	121.41	93.96	27.45	4.423			
2,300.00	2,298.64	2,302.64	2,302.64	20.55	8.06	144.84	65.00	-0.20	122.59	94.11	28.48	4.305			
2,302.89	2,301.53	2,305.53	2,305.53	20.57	8.07	144.70	65.00	-0.20	122.63	94.11	28.51	4.301			
2,387.89	2,386.52	2,390.52	2,390.52	21.34	8.37	140.15	65.00	-0.20	123.59	94.01	29.58	4.178			
2,400.00	2,398.63	2,402.63	2,402.63	21.44	8.41	138.37	65.00	-0.20	123.70	93.97	29.73	4.161			
2,473.89	2,472.52	2,476.52	2,476.52	22.10	8.68	121.56	65.00	-0.20	124.21	93.55	30.65	4.052			
2,500.00	2,498.63	2,502.63	2,502.63	22.33	8.77	116.38	65.00	-0.20	124.31	93.33	30.98	4.013			
2,558.89	2,557.51	2,561.51	2,561.51	22.85	8.98	103.84	65.00	-0.20	124.48	92.77	31.71	3.926			
2,600.00	2,598.62	2,602.62	2,602.62	23.21	9.13	101.49	65.00	-0.20	124.55	92.34	32.22	3.866			

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #48H - OH - Plan #3 11-18-15													Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
2,643.89	2,642.51	2,646.51	2,646.51	23.60	9.29	99.51	65.00	-0.20	124.63	91.87	32.76	3.804		
2,700.00	2,698.62	2,702.62	2,702.62	24.08	9.49	88.87	65.00	-0.20	124.67	91.22	33.45	3.727		
2,728.89	2,727.51	2,731.51	2,731.51	24.33	9.59	83.52	65.00	-0.20	124.65	90.85	33.80	3.688		
2,794.73	2,793.34	2,797.34	2,797.34	24.90	9.83	90.00	65.00	-0.20	124.61	90.00	34.61	3.601		
2,800.00	2,798.61	2,802.61	2,802.61	24.95	9.85	90.47	65.00	-0.20	124.61	89.94	34.67	3.594		
2,813.89	2,812.50	2,816.50	2,816.50	25.07	9.90	91.67	65.00	-0.20	124.62	89.77	34.84	3.577		
2,898.89	2,897.50	2,901.50	2,901.50	25.80	10.20	74.57	65.00	-0.20	124.50	88.62	35.88	3.470		
2,900.00	2,898.61	2,902.61	2,902.61	25.81	10.21	74.74	65.00	-0.20	124.50	88.61	35.89	3.469		
2,983.89	2,982.49	2,986.49	2,986.49	26.52	10.51	87.92	65.00	-0.20	124.36	87.44	36.92	3.369		
3,000.00	2,998.60	3,002.60	3,002.60	26.66	10.56	87.27	65.00	-0.20	124.35	87.24	37.11	3.351		
3,068.89	3,067.49	3,071.49	3,071.49	27.26	10.81	84.24	65.00	-0.20	124.29	86.34	37.96	3.275		
3,100.00	3,098.59	3,102.59	3,102.59	27.53	10.92	82.57	65.00	-0.20	124.26	85.92	38.34	3.241		
3,153.89	3,152.48	3,156.48	3,156.48	28.00	11.12	79.51	65.00	-0.20	124.17	85.17	39.01	3.183		
3,200.00	3,198.59	3,202.59	3,202.59	28.40	11.28	80.65	65.00	-0.20	124.09	84.52	39.57	3.136		
3,239.89	3,238.48	3,242.48	3,242.48	28.75	11.42	81.52	65.00	-0.20	124.02	83.96	40.06	3.096		
3,300.00	3,298.58	3,302.58	3,302.58	29.26	11.64	68.53	65.00	-0.20	123.84	83.04	40.79	3.036		
3,324.89	3,323.47	3,327.47	3,327.47	29.48	11.73	63.35	65.00	-0.20	123.71	82.61	41.10	3.010		
3,384.82	3,383.40	3,387.40	3,387.40	30.00	11.94	90.00	65.00	-0.20	123.55	81.71	41.84	2.953		
3,400.00	3,398.57	3,402.57	3,402.57	30.13	12.00	95.79	65.00	-0.20	123.56	81.53	42.02	2.940		
3,409.89	3,408.46	3,412.46	3,412.46	30.21	12.03	99.27	65.00	-0.20	123.58	81.43	42.15	2.932		
3,494.89	3,493.45	3,497.45	3,497.45	30.96	12.34	94.99	65.00	-0.20	123.73	80.53	43.20	2.864		
3,500.00	3,498.56	3,502.56	3,502.56	31.00	12.36	95.27	65.00	-0.20	123.73	80.47	43.26	2.860		
3,579.89	3,578.45	3,582.45	3,582.45	31.71	12.64	100.64	65.00	-0.20	123.86	79.61	44.25	2.799		
3,600.00	3,598.56	3,602.56	3,602.56	31.89	12.72	99.82	65.00	-0.20	123.90	79.40	44.50	2.784		
3,664.89	3,663.44	3,667.44	3,667.44	32.46	12.95	97.35	65.00	-0.20	124.01	78.71	45.30	2.737		
3,700.00	3,698.55	3,702.55	3,702.55	32.77	13.07	101.24	65.00	-0.20	124.07	78.33	45.74	2.713		
3,749.89	3,748.44	3,752.44	3,752.44	33.20	13.25	108.29	65.00	-0.20	124.19	77.84	46.36	2.679		
3,800.00	3,798.55	3,802.55	3,802.55	33.65	13.43	114.55	65.00	-0.20	124.34	77.36	46.99	2.646		
3,834.89	3,833.43	3,837.43	3,837.43	33.96	13.56	120.05	65.00	-0.20	124.46	77.04	47.42	2.624		
3,900.00	3,898.54	3,902.54	3,902.54	34.54	13.79	106.49	65.00	-0.20	124.63	76.40	48.23	2.584		
3,919.89	3,918.43	3,922.43	3,922.43	34.72	13.86	101.65	65.00	-0.20	124.66	76.18	48.48	2.571		
4,000.00	3,998.54	4,002.54	4,002.54	35.44	14.15	100.16	65.00	-0.20	124.75	75.26	49.49	2.521		
4,089.89	4,088.43	4,092.43	4,092.43	36.24	14.47	98.30	65.00	-0.20	124.83	74.21	50.62	2.466		
4,100.00	4,098.54	4,102.54	4,102.54	36.33	14.51	99.44	65.00	-0.20	124.84	74.10	50.74	2.460		
4,167.89	4,166.43	4,170.43	4,170.43	36.93	14.75	106.85	65.00	-0.20	124.92	73.34	51.58	2.422		
4,200.00	4,198.54	4,202.54	4,202.54	37.07	14.87	116.02	65.00	-0.20	124.99	73.14	51.84	2.411		
4,225.00	4,223.54	4,227.54	4,227.54	37.18	14.96	123.62	65.00	-0.20	125.05	73.01	52.04	2.403		
4,268.00	4,266.53	4,270.53	4,270.53	37.18	15.11	-46.29	65.00	-0.20	124.62	72.45	52.17	2.389		
4,300.00	4,298.46	4,302.46	4,302.46	37.18	15.22	-45.22	65.00	-0.20	123.22	71.05	52.16	2.362		
4,310.00	4,308.41	4,312.41	4,312.41	37.18	15.26	-45.43	65.00	-0.20	122.51	70.36	52.15	2.349		
4,353.00	4,350.91	4,354.91	4,354.91	37.19	15.41	-48.35	65.00	-0.20	118.04	66.03	52.00	2.270		
4,395.00	4,391.74	4,395.74	4,395.74	37.19	15.56	-54.02	65.00	-0.20	111.82	59.92	51.91	2.154		
4,400.00	4,396.55	4,400.55	4,400.55	37.19	15.58	-54.72	65.00	-0.20	110.99	59.09	51.90	2.139		
4,438.00	4,432.56	4,436.56	4,436.56	37.19	15.70	-60.98	65.00	-0.20	104.30	52.33	51.97	2.007		
4,481.00	4,472.05	4,476.05	4,476.05	37.20	15.85	-72.09	65.00	-0.20	97.08	44.60	52.48	1.850		
4,500.00	4,489.02	4,493.02	4,493.02	37.21	15.91	-78.56	65.00	-0.20	94.68	41.86	52.82	1.792		
4,523.00	4,509.15	4,513.15	4,513.15	37.22	15.98	-86.45	65.00	-0.20	93.04	39.91	53.14	1.751		
4,532.08	4,516.96	4,520.96	4,520.96	37.22	16.01	-90.00	65.00	-0.20	92.88	39.67	53.21	1.746 ES, SF		
4,566.00	4,545.45	4,549.45	4,549.45	37.24	16.11	-102.65	65.00	-0.20	95.36	42.40	52.96	1.801		
4,600.00	4,572.72	4,576.72	4,576.72	37.26	16.21	-113.33	65.00	-0.20	103.05	51.19	51.85	1.987		
4,608.00	4,578.92	4,582.92	4,582.92	37.27	16.23	-115.61	65.00	-0.20	105.61	54.14	51.48	2.052		
4,651.00	4,610.56	4,614.56	4,614.56	37.31	16.34	-124.95	65.00	-0.20	123.79	74.74	49.05	2.524		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #48H - OH - Plan #3 11-18-15													Offset Site Error: 0.00 usft	
Survey Program: O-PHX-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	
4,694.00	4,639.01	4,643.01	4,643.01	37.37	16.44	-130.10	65.00	-0.20	148.27	101.70	46.57	3.184		
4,700.00	4,642.70	4,646.70	4,646.70	37.38	16.46	-130.45	65.00	-0.20	152.10	105.81	46.28	3.286		
4,736.00	4,663.33	4,667.33	4,667.33	37.46	16.53	-131.71	65.00	-0.20	176.77	131.97	44.80	3.945		
4,779.00	4,684.73	4,688.73	4,688.73	37.58	16.61	-129.43	65.00	-0.20	209.05	164.17	44.88	4.658		
4,800.00	4,694.04	4,698.04	4,698.04	37.66	16.64	-128.29	65.00	-0.20	225.55	180.42	45.13	4.998		
4,821.00	4,702.68	4,706.68	4,706.68	37.73	16.67	-126.82	65.00	-0.20	242.42	196.86	45.57	5.320		
4,864.00	4,718.51	4,722.51	4,722.51	37.93	16.73	-126.55	65.00	-0.20	278.29	232.85	45.45	6.124		
4,900.00	4,729.77	4,747.74	4,747.74	38.13	16.82	-128.42	65.00	0.36	309.41	265.08	44.32	6.980		
4,906.00	4,731.45	4,752.86	4,752.84	38.16	16.84	-128.91	65.01	0.63	314.64	270.60	44.04	7.144		
4,949.00	4,741.19	4,793.84	4,793.59	38.43	16.98	-130.90	65.03	4.80	352.53	309.89	42.65	8.266		
4,991.00	4,747.73	4,851.73	4,850.23	38.74	17.17	-140.28	65.11	16.61	389.68	353.06	36.62	10.642		
5,000.00	4,748.90	4,869.26	4,867.06	38.82	17.23	-143.04	65.15	21.53	397.51	362.86	34.65	11.473		
5,036.00	4,752.94	4,979.47	4,967.54	39.11	17.62	-154.89	65.45	66.20	427.42	402.04	25.38	16.842		
5,078.00	4,756.20	5,309.84	5,173.95	39.49	19.66	-165.54	67.15	315.70	452.13	435.41	16.72	27.043		
5,100.00	4,757.41	5,474.35	5,202.22	39.71	21.78	-166.59	68.25	476.96	453.20	436.48	16.72	27.107		
5,121.00	4,758.48	5,495.34	5,202.67	39.91	22.10	-166.63	68.39	497.94	452.49	435.62	16.87	26.818		
5,200.00	4,762.13	5,574.30	5,204.37	40.81	23.43	-166.76	68.93	576.88	450.26	432.60	17.66	25.491		
5,248.00	4,764.13	5,622.29	5,205.40	41.35	24.29	-166.82	69.26	624.85	449.16	430.97	18.19	24.693		
5,300.00	4,766.13	5,674.28	5,206.52	42.05	25.28	-166.87	69.61	676.83	448.18	429.35	18.83	23.805		
5,376.00	4,768.71	5,750.27	5,208.15	43.07	26.81	-166.92	70.13	752.80	447.12	427.30	19.82	22.561		
5,400.00	4,769.47	5,774.27	5,208.66	43.44	27.31	-166.93	70.29	776.79	446.87	426.70	20.17	22.161		
5,500.00	4,772.61	5,874.26	5,210.81	44.96	29.48	-166.86	70.97	876.76	446.01	424.26	21.75	20.507		
5,504.00	4,772.73	5,878.26	5,210.90	45.02	29.57	-166.85	71.00	880.76	445.98	424.16	21.82	20.442		
5,577.59	4,774.78	5,951.84	5,212.48	46.27	31.24	-166.73	71.50	954.32	445.73	422.66	23.07	19.320		
5,600.00	4,775.31	5,974.25	5,212.96	46.64	31.76	-166.70	71.65	976.73	445.75	422.29	23.46	19.003		
5,631.00	4,775.95	6,005.25	5,213.63	47.17	32.48	-166.65	71.87	1,007.72	445.86	421.87	23.99	18.585		
5,700.00	4,777.14	6,074.25	5,215.11	48.43	34.13	-166.59	72.34	1,076.70	446.24	421.05	25.19	17.714		
5,759.00	4,777.96	6,133.25	5,216.38	49.51	35.57	-166.62	72.74	1,135.68	446.63	420.48	26.14	17.084		
5,800.00	4,778.39	6,174.24	5,217.26	50.30	36.58	-166.69	73.02	1,176.66	446.93	420.17	26.76	16.701		
5,886.00	4,778.84	6,260.18	5,219.11	51.97	38.72	-167.05	73.60	1,262.59	447.69	419.83	27.86	16.072		
5,900.00	4,778.85	6,274.17	5,219.41	52.26	39.08	-167.13	73.70	1,276.57	447.85	419.84	28.01	15.989		
6,000.00	4,777.71	6,374.06	5,221.56	54.30	41.62	-167.63	74.38	1,376.43	450.34	421.14	29.20	15.422		
6,014.00	4,777.39	6,388.04	5,221.86	54.58	41.98	-167.69	74.47	1,390.41	450.88	421.50	29.38	15.347		
6,100.00	4,775.64	6,473.96	5,223.70	56.42	44.21	-167.96	75.06	1,476.30	454.13	423.57	30.56	14.858		
6,142.00	4,775.05	6,515.93	5,224.61	57.32	45.31	-168.02	75.34	1,518.27	455.58	424.35	31.23	14.590		
6,200.00	4,774.48	6,573.90	5,225.85	58.60	46.83	-168.05	75.74	1,576.22	457.39	425.16	32.22	14.194		
6,269.00	4,774.16	6,642.88	5,227.33	60.14	48.66	-168.06	76.21	1,645.18	459.22	425.77	33.46	13.726		
6,300.00	4,774.16	6,673.87	5,228.00	60.84	49.48	-168.06	76.42	1,676.17	459.89	425.86	34.03	13.515		
6,397.00	4,774.83	6,770.84	5,230.08	63.06	52.07	-168.28	77.08	1,773.11	460.91	425.39	35.52	12.977		
6,400.00	4,774.87	6,773.84	5,230.15	63.13	52.15	-168.29	77.10	1,776.11	460.92	425.36	35.56	12.963		
6,500.00	4,777.46	6,873.75	5,232.30	65.46	54.85	-168.75	77.78	1,876.00	459.69	422.87	36.82	12.485		
6,525.00	4,778.52	6,898.72	5,232.83	66.04	55.52	-168.88	77.95	1,900.96	458.96	421.84	37.11	12.366		
6,600.00	4,781.65	6,973.62	5,234.44	67.83	57.55	-169.28	78.46	1,975.84	456.80	418.85	37.95	12.037		
6,653.00	4,783.54	7,026.57	5,235.58	69.09	59.00	-169.54	78.82	2,028.78	455.65	417.10	38.55	11.818		
6,700.00	4,784.98	7,073.54	5,236.59	70.23	60.28	-169.75	79.14	2,075.73	454.92	415.80	39.12	11.629		
6,781.00	4,786.89	7,154.50	5,238.33	72.20	62.50	-170.05	79.69	2,156.68	454.35	414.18	40.17	11.311		
6,793.99	4,787.13	7,167.48	5,238.61	72.52	62.85	-170.08	79.78	2,169.66	454.34	413.99	40.35	11.261		
6,800.00	4,787.24	7,173.50	5,238.74	72.67	63.02	-170.10	79.82	2,175.67	454.34	413.91	40.43	11.238		
6,900.00	4,788.40	7,273.48	5,240.89	75.14	65.77	-170.31	80.50	2,275.63	455.06	413.17	41.89	10.863		
6,909.00	4,788.45	7,282.48	5,241.08	75.37	66.02	-170.33	80.56	2,284.62	455.19	413.16	42.03	10.830		
7,000.00	4,789.27	7,373.46	5,243.04	77.65	68.53	-170.52	81.18	2,375.58	456.07	412.67	43.39	10.510		
7,037.00	4,789.80	7,410.44	5,243.83	78.58	69.55	-170.65	81.44	2,412.55	456.15	412.29	43.87	10.399		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #48H - OH - Plan #3 11-18-15														Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance				Minimum Separation (usft)	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)					
7,100.00	4,791.06	7,473.41	5,245.18	80.17	71.30	-170.91	81.86	2,475.50	455.91	411.27	44.64	10.213			
7,164.00	4,792.90	7,537.37	5,246.56	81.79	73.07	-171.17	82.30	2,539.45	455.12	409.68	45.44	10.016			
7,200.00	4,794.08	7,573.35	5,247.33	82.72	74.07	-171.31	82.54	2,575.42	454.53	408.65	45.88	9.907			
7,292.00	4,797.03	7,665.29	5,249.31	85.07	76.63	-171.67	83.17	2,667.34	453.12	406.13	46.99	9.643			
7,300.00	4,797.28	7,673.29	5,249.48	85.28	76.85	-171.70	83.23	2,675.33	453.00	405.92	47.08	9.621			
7,400.00	4,799.87	7,773.25	5,251.63	87.86	79.64	-172.06	83.91	2,775.26	452.18	403.85	48.33	9.356			
7,420.00	4,800.27	7,793.24	5,252.06	88.38	80.20	-172.11	84.04	2,795.25	452.14	403.55	48.59	9.304			
7,428.77	4,800.44	7,802.01	5,252.25	88.61	80.45	-172.14	84.10	2,804.02	452.14	403.43	48.71	9.282			
7,500.00	4,801.63	7,873.23	5,253.78	90.47	82.44	-172.30	84.59	2,875.22	452.32	402.61	49.71	9.099			
7,547.00	4,802.26	7,920.23	5,254.79	91.70	83.76	-172.37	84.91	2,922.21	452.63	402.21	50.42	8.978			
7,600.00	4,803.12	7,973.22	5,255.93	93.09	85.24	-172.42	85.27	2,975.19	452.86	401.58	51.28	8.832			
7,675.00	4,805.06	8,048.22	5,257.54	95.06	87.35	-172.49	85.78	3,050.17	452.45	399.96	52.50	8.619			
7,700.00	4,805.81	8,073.22	5,258.08	95.73	88.05	-172.52	85.95	3,075.16	452.21	399.33	52.89	8.551			
7,776.03	4,807.74	8,149.25	5,259.71	97.74	90.18	-172.54	86.47	3,151.17	451.90	397.78	54.12	8.349			
7,800.00	4,808.24	8,173.22	5,260.23	98.38	90.86	-172.53	86.63	3,175.13	451.93	397.40	54.53	8.288			
7,803.00	4,808.30	8,176.22	5,260.29	98.46	90.94	-172.53	86.65	3,178.13	451.94	397.35	54.58	8.280			
7,900.00	4,809.77	8,273.20	5,262.37	101.05	93.67	-172.40	87.31	3,275.09	452.72	396.33	56.39	8.028			
7,930.00	4,810.07	8,303.19	5,263.02	101.85	94.52	-172.32	87.52	3,305.08	453.16	396.16	57.00	7.950			
8,000.00	4,811.35	8,373.17	5,264.52	103.72	96.49	-172.10	87.99	3,375.03	453.62	394.98	58.64	7.735			
8,058.00	4,813.42	8,431.15	5,265.77	105.28	98.12	-171.94	88.39	3,433.00	452.95	392.99	59.96	7.554			
8,100.00	4,815.23	8,473.14	5,266.67	106.41	99.31	-171.84	88.67	3,474.98	452.16	391.30	60.86	7.430			
8,186.00	4,818.78	8,559.09	5,268.52	108.73	101.73	-171.54	89.26	3,560.91	450.79	387.95	62.85	7.173			
8,200.00	4,819.35	8,573.08	5,268.82	109.11	102.13	-171.48	89.35	3,574.90	450.59	387.39	63.20	7.130			
8,300.00	4,823.97	8,673.03	5,270.97	111.81	104.95	-171.17	90.03	3,674.82	448.41	382.96	65.46	6.850			
8,314.00	4,824.70	8,687.03	5,271.27	112.19	105.35	-171.15	90.13	3,688.81	448.01	382.27	65.74	6.815			
8,400.00	4,829.00	8,772.99	5,273.12	114.52	107.78	-171.03	90.71	3,774.75	445.68	378.22	67.46	6.607			
8,442.00	4,830.95	8,814.97	5,274.02	115.66	108.97	-170.96	91.00	3,816.73	444.70	376.38	68.32	6.509			
8,500.00	4,833.63	8,872.95	5,275.27	117.24	110.61	-170.88	91.40	3,874.69	443.35	373.86	69.49	6.380			
8,570.00	4,836.98	8,942.93	5,276.77	119.14	112.59	-170.85	91.87	3,944.65	441.50	370.75	70.74	6.241			
8,600.00	4,838.43	8,972.92	5,277.41	119.96	113.44	-170.86	92.08	3,974.63	440.67	369.41	71.26	6.184			
8,698.00	4,842.90	9,070.89	5,279.52	122.64	116.22	-170.84	92.74	4,072.58	438.31	365.26	73.05	6.000			
8,700.00	4,842.99	9,072.89	5,279.56	122.69	116.28	-170.84	92.76	4,074.58	438.27	365.18	73.09	5.996			
8,800.00	4,846.99	9,172.87	5,281.71	125.43	119.11	-170.74	93.44	4,174.53	436.53	361.45	75.07	5.815			
8,825.00	4,847.88	9,197.87	5,282.25	126.12	119.82	-170.70	93.61	4,199.52	436.22	360.62	75.60	5.770			
8,900.00	4,850.46	9,272.86	5,283.86	128.18	121.95	-170.57	94.12	4,274.49	435.39	358.21	77.18	5.641			
8,953.00	4,852.24	9,325.85	5,285.00	129.64	123.46	-170.51	94.48	4,327.47	434.82	356.57	78.25	5.557			
9,000.00	4,853.77	9,372.85	5,286.01	130.93	124.79	-170.47	94.80	4,374.46	434.34	355.17	79.17	5.486			
9,081.00	4,856.26	9,453.84	5,287.75	133.16	127.09	-170.41	95.35	4,455.43	433.65	352.91	80.75	5.371			
9,100.00	4,856.82	9,472.84	5,288.16	133.69	127.63	-170.40	95.48	4,474.43	433.51	352.40	81.12	5.344			
9,200.00	4,859.79	9,572.84	5,290.31	136.45	130.48	-170.28	96.16	4,574.40	432.84	349.64	83.20	5.202			
9,208.00	4,860.03	9,580.83	5,290.48	136.67	130.70	-170.27	96.22	4,582.39	432.79	349.42	83.38	5.191			
9,300.00	4,862.58	9,672.82	5,292.46	139.22	133.32	-170.06	96.84	4,674.35	432.50	346.96	85.54	5.056			
9,304.99	4,862.71	9,677.81	5,292.56	139.36	133.46	-170.05	96.88	4,679.34	432.50	346.83	85.67	5.049			
9,336.00	4,863.49	9,708.81	5,293.23	140.21	134.34	-169.95	97.09	4,710.33	432.53	346.06	86.47	5.002			
9,400.00	4,865.14	9,772.79	5,294.61	141.99	136.16	-169.76	97.52	4,774.30	432.47	344.40	88.07	4.910			
9,464.00	4,866.95	9,836.79	5,295.98	143.76	137.98	-169.72	97.96	4,838.28	432.04	342.76	89.28	4.839			
9,500.00	4,867.95	9,872.79	5,296.75	144.76	139.01	-169.75	98.20	4,874.27	431.79	341.91	89.88	4.804			
9,533.34	4,868.75	9,906.13	5,297.47	145.69	139.96	-169.76	98.43	4,907.60	431.71	341.23	90.48	4.771			
9,592.00	4,869.86	9,964.79	5,298.73	147.32	141.63	-169.71	98.83	4,966.25	431.95	340.28	91.67	4.712			
9,600.00	4,869.98	9,972.79	5,298.90	147.54	141.86	-169.69	98.89	4,974.24	432.02	340.17	91.84	4.704			
9,700.00	4,870.76	10,072.75	5,301.05	150.33	144.70	-169.45	99.57	5,074.18	433.77	339.56	94.21	4.604			
9,720.00	4,870.75	10,092.73	5,301.48	150.89	145.27	-169.39	99.70	5,094.16	434.32	339.59	94.73	4.585			

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #48H - OH - Plan #3 11-18-15												Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+HDGM												Offset Well Error:	0.00 usft
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			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Factor	
9,800.00	4,870.61	10,172.67	5,303.20	153.12	147.55	-169.09	100.25	5,174.08	436.64	339.61	97.03	4.500	
9,827.00	4,870.56	10,199.65	5,303.78	153.87	148.32	-168.99	100.43	5,201.05	437.42	339.61	97.81	4.472	



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #50H - OH - Plan #2 11-18-15													Offset Site Error: 0.00 usft	
Survey Program: 0-PHX+MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	+N/-S (usft)		+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	8.00	8.00	0.00	0.01	-0.18	130.00	-0.40	130.00					
98.89	98.89	106.89	106.89	0.57	0.18	134.73	130.00	-0.40	130.38	129.65	0.74	176.842		
100.00	100.00	108.00	108.00	0.59	0.19	134.64	130.00	-0.40	130.39	129.64	0.75	172.877		
200.00	199.99	207.99	207.99	1.72	0.55	130.34	130.00	-0.40	131.42	129.15	2.27	57.939		
300.00	299.96	307.96	307.96	2.87	0.90	129.30	130.00	-0.40	132.97	129.19	3.78	35.208		
336.89	336.83	344.83	344.83	3.29	1.04	129.24	130.00	-0.40	133.68	129.35	4.33	30.852		
400.00	399.89	407.89	407.89	3.80	1.26	133.61	130.00	-0.40	135.35	130.27	5.09	26.614		
425.89	425.74	433.74	433.74	4.01	1.36	134.87	130.00	-0.40	136.28	130.88	5.40	25.256		
500.00	499.73	507.73	507.73	4.64	1.62	139.63	130.00	-0.40	139.41	133.12	6.29	22.162		
514.89	514.59	522.59	522.59	4.76	1.67	140.49	130.00	-0.40	140.11	133.64	6.47	21.655		
556.89	556.51	564.51	564.51	5.10	1.82	139.30	130.00	-0.40	142.11	135.16	6.95	20.448		
600.00	599.54	607.54	607.54	5.48	1.98	138.20	130.00	-0.40	144.06	136.59	7.48	19.272		
684.89	684.30	692.30	692.30	6.23	2.28	135.30	130.00	-0.40	147.50	138.99	8.51	17.332		
700.00	699.39	707.39	707.39	6.36	2.34	136.72	130.00	-0.40	148.07	139.37	8.69	17.033		
769.89	769.20	777.20	777.20	6.96	2.59	143.63	130.00	-0.40	150.75	141.21	9.54	15.806		
800.00	799.27	807.27	807.27	7.22	2.69	142.43	130.00	-0.40	151.90	142.00	9.90	15.343		
854.89	854.10	862.10	862.10	7.70	2.89	140.01	130.00	-0.40	153.86	143.30	10.56	14.567		
900.00	899.17	907.17	907.17	8.09	3.05	140.87	130.00	-0.40	155.40	144.28	11.12	13.977		
940.89	940.02	948.02	948.02	8.46	3.20	141.65	130.00	-0.40	156.77	145.15	11.62	13.489		
1,000.00	999.08	1,007.08	1,007.08	8.99	3.41	142.83	130.00	-0.40	158.74	146.39	12.36	12.845		
1,025.89	1,024.95	1,032.95	1,032.95	9.22	3.50	143.34	130.00	-0.40	159.61	146.93	12.68	12.587		
1,100.00	1,099.00	1,107.00	1,107.00	9.87	3.77	139.57	130.00	-0.40	161.92	148.33	13.59	11.911		
1,110.89	1,109.88	1,117.88	1,117.88	9.97	3.81	138.95	130.00	-0.40	162.24	148.51	13.73	11.818		
1,195.89	1,194.83	1,202.83	1,202.83	10.73	4.11	139.50	130.00	-0.40	164.48	149.69	14.78	11.125		
1,200.00	1,198.94	1,206.94	1,206.94	10.77	4.13	138.45	130.00	-0.40	164.58	149.74	14.84	11.093		
1,281.89	1,280.79	1,288.79	1,288.79	11.49	4.42	116.33	130.00	-0.40	166.10	150.25	15.85	10.481		
1,300.00	1,298.89	1,306.89	1,306.89	11.65	4.49	122.74	130.00	-0.40	166.37	150.30	16.07	10.353		
1,366.89	1,365.75	1,373.75	1,373.75	12.23	4.73	147.80	130.00	-0.40	167.75	150.86	16.89	9.932		
1,400.00	1,398.85	1,406.85	1,406.85	12.52	4.84	141.46	130.00	-0.40	168.52	151.23	17.30	9.744		
1,500.00	1,498.81	1,506.81	1,506.81	13.39	5.20	117.35	130.00	-0.40	170.16	151.64	18.52	9.188		
1,536.89	1,535.69	1,543.69	1,543.69	13.71	5.33	107.56	130.00	-0.40	170.50	151.53	18.97	8.987		
1,600.00	1,598.79	1,606.79	1,606.79	14.27	5.56	137.04	130.00	-0.40	171.26	151.51	19.75	8.671		
1,621.89	1,620.67	1,628.67	1,628.67	14.46	5.64	147.20	130.00	-0.40	171.66	151.64	20.02	8.574		
1,700.00	1,698.76	1,706.76	1,706.76	15.17	5.92	150.31	130.00	-0.40	173.20	152.19	21.01	8.244		
1,792.89	1,791.63	1,799.63	1,799.63	16.02	6.25	154.27	130.00	-0.40	175.01	152.82	22.19	7.888		
1,800.00	1,798.74	1,806.74	1,806.74	16.08	6.28	154.72	130.00	-0.40	175.15	152.87	22.27	7.863		
1,877.89	1,876.61	1,884.61	1,884.61	16.78	6.56	159.70	130.00	-0.40	176.67	153.42	23.25	7.599		
1,900.00	1,898.71	1,906.71	1,906.71	16.98	6.64	154.94	130.00	-0.40	177.10	153.57	23.52	7.529		
1,962.89	1,961.59	1,969.59	1,969.59	17.53	6.86	140.07	130.00	-0.40	178.15	153.85	24.30	7.331		
2,000.00	1,998.69	2,006.69	2,006.69	17.86	6.99	139.50	130.00	-0.40	178.70	153.93	24.76	7.216		
2,047.89	2,046.57	2,054.57	2,054.57	18.29	7.17	138.80	130.00	-0.40	179.41	154.05	25.36	7.073		
2,100.00	2,098.67	2,106.67	2,106.67	18.76	7.35	138.85	130.00	-0.40	180.19	154.17	26.01	6.927		
2,200.00	2,198.66	2,206.66	2,206.66	19.65	7.71	138.92	130.00	-0.40	181.64	154.38	27.26	6.663		
2,217.89	2,216.54	2,224.54	2,224.54	19.81	7.78	138.93	130.00	-0.40	181.89	154.41	27.48	6.618		
2,300.00	2,298.64	2,306.64	2,306.64	20.55	8.07	135.59	130.00	-0.40	182.94	154.42	28.51	6.416		
2,302.89	2,301.53	2,309.53	2,309.53	20.57	8.08	135.45	130.00	-0.40	182.97	154.42	28.55	6.409		
2,387.89	2,386.52	2,394.52	2,394.52	21.34	8.38	130.83	130.00	-0.40	183.80	154.18	29.62	6.206		
2,400.00	2,398.63	2,406.63	2,406.63	21.44	8.43	129.04	130.00	-0.40	183.90	154.13	29.77	6.178		
2,473.89	2,472.52	2,480.52	2,480.52	22.10	8.69	112.17	130.00	-0.40	184.30	153.61	30.69	6.005		
2,500.00	2,498.63	2,506.63	2,506.63	22.33	8.79	106.97	130.00	-0.40	184.37	153.36	31.01	5.945		
2,558.89	2,557.51	2,565.51	2,565.51	22.85	9.00	94.36	130.00	-0.40	184.46	152.72	31.75	5.811		
2,600.00	2,598.62	2,606.62	2,606.62	23.21	9.15	91.96	130.00	-0.40	184.48	152.23	32.25	5.720		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #50H - OH - Plan.#2 11-18-15													Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation	Factor		
Depth	Depth	Depth	Depth	Depth	Depth	Toolface	+N-S	Centres	Ellipses	Separation				
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
2,643.89	2,642.51	2,650.51	2,650.51	23.60	9.30	89.93	130.00	-0.40	184.49	151.69	32.79	5.626		
2,700.00	2,698.62	2,706.62	2,706.62	24.08	9.50	79.21	130.00	-0.40	184.44	150.95	33.48	5.508		
2,728.89	2,727.51	2,735.51	2,735.51	24.33	9.61	73.81	130.00	-0.40	184.37	150.53	33.84	5.449		
2,800.00	2,798.61	2,806.61	2,806.61	24.95	9.86	80.64	130.00	-0.40	184.20	149.49	34.71	5.307		
2,813.89	2,812.50	2,820.50	2,820.50	25.07	9.91	81.82	130.00	-0.40	184.18	149.30	34.88	5.281		
2,898.89	2,897.50	2,905.50	2,905.50	25.80	10.22	64.57	130.00	-0.40	183.90	147.99	35.91	5.121		
2,900.00	2,898.61	2,906.61	2,906.61	25.81	10.22	64.73	130.00	-0.40	183.90	147.97	35.93	5.119		
2,983.89	2,982.49	2,990.49	2,990.49	26.52	10.52	77.77	130.00	-0.40	183.59	146.64	36.95	4.968		
3,000.00	2,998.60	3,006.60	3,006.60	26.66	10.58	77.08	130.00	-0.40	183.56	146.41	37.15	4.941		
3,068.89	3,067.49	3,075.49	3,075.49	27.26	10.83	73.93	130.00	-0.40	183.37	145.38	37.99	4.826		
3,100.00	3,098.59	3,106.59	3,106.59	27.53	10.94	72.22	130.00	-0.40	183.28	144.90	38.38	4.776		
3,153.89	3,152.48	3,160.48	3,160.48	28.00	11.13	69.07	130.00	-0.40	183.10	144.05	39.04	4.690		
3,200.00	3,198.59	3,206.59	3,206.59	28.40	11.30	70.13	130.00	-0.40	182.93	143.32	39.61	4.618		
3,238.89	3,238.48	3,246.48	3,246.48	28.75	11.44	70.93	130.00	-0.40	182.78	142.68	40.10	4.558		
3,300.00	3,298.58	3,306.58	3,306.58	29.26	11.65	57.82	130.00	-0.40	182.47	141.64	40.83	4.469		
3,324.89	3,323.47	3,331.47	3,331.47	29.48	11.74	52.59	130.00	-0.40	182.30	141.16	41.14	4.432		
3,400.00	3,398.57	3,406.57	3,406.57	30.13	12.01	84.88	130.00	-0.40	181.97	139.91	42.06	4.326		
3,409.89	3,408.46	3,416.46	3,416.46	30.21	12.05	88.34	130.00	-0.40	181.96	139.78	42.18	4.314		
3,494.89	3,493.45	3,501.45	3,501.45	30.96	12.35	83.89	130.00	-0.40	181.88	138.65	43.23	4.207		
3,500.00	3,498.56	3,506.56	3,506.56	31.00	12.37	84.15	130.00	-0.40	181.87	138.58	43.30	4.201		
3,579.89	3,578.45	3,586.45	3,586.45	31.71	12.66	89.38	130.00	-0.40	181.81	137.52	44.29	4.105		
3,600.00	3,598.56	3,606.56	3,606.56	31.89	12.73	88.53	130.00	-0.40	181.81	137.27	44.54	4.082		
3,664.89	3,663.44	3,671.44	3,671.44	32.46	12.96	85.96	130.00	-0.40	181.77	136.43	45.34	4.009		
3,700.00	3,698.55	3,706.55	3,706.55	32.77	13.09	89.79	130.00	-0.40	181.76	135.98	45.78	3.970		
3,701.72	3,700.27	3,708.27	3,708.27	32.78	13.09	90.00	130.00	-0.40	181.76	135.96	45.80	3.968		
3,749.89	3,748.44	3,756.44	3,756.44	33.20	13.27	96.78	130.00	-0.40	181.78	135.39	46.40	3.918		
3,800.00	3,798.55	3,806.55	3,806.55	33.65	13.45	102.99	130.00	-0.40	181.85	134.83	47.03	3.867		
3,834.89	3,833.43	3,841.43	3,841.43	33.96	13.57	108.46	130.00	-0.40	181.92	134.46	47.46	3.833		
3,900.00	3,898.54	3,906.54	3,906.54	34.54	13.80	94.85	130.00	-0.40	182.01	133.74	48.27	3.770		
3,919.89	3,918.43	3,926.43	3,926.43	34.72	13.88	90.00	130.00	-0.40	182.02	133.49	48.52	3.751		
4,000.00	3,998.54	4,006.54	4,006.54	35.44	14.16	88.45	130.00	-0.40	182.01	132.48	49.53	3.675		
4,089.89	4,088.43	4,096.43	4,096.43	36.24	14.49	86.52	130.00	-0.40	181.99	131.33	50.66	3.593		
4,100.00	4,098.54	4,106.54	4,106.54	36.33	14.52	87.65	130.00	-0.40	181.99	131.20	50.78	3.584		
4,121.32	4,119.86	4,127.86	4,127.86	36.52	14.60	90.00	130.00	-0.40	181.98	130.94	51.05	3.565		
4,167.89	4,166.43	4,174.43	4,174.43	36.93	14.77	95.00	130.00	-0.40	182.00	130.37	51.62	3.525		
4,200.00	4,198.54	4,206.54	4,206.54	37.07	14.88	104.16	130.00	-0.40	182.02	130.14	51.88	3.508		
4,225.00	4,223.54	4,231.54	4,231.54	37.18	14.97	111.75	130.00	-0.40	182.06	129.98	52.08	3.496		
4,268.00	4,266.53	4,274.53	4,274.53	37.18	15.12	-58.12	130.00	-0.40	181.73	129.51	52.22	3.480		
4,300.00	4,298.46	4,306.46	4,306.46	37.18	15.24	-56.92	130.00	-0.40	180.64	128.38	52.26	3.456		
4,310.00	4,308.41	4,316.41	4,316.41	37.18	15.27	-57.07	130.00	-0.40	180.09	127.83	52.27	3.446		
4,353.00	4,350.91	4,358.91	4,358.91	37.19	15.43	-59.45	130.00	-0.40	176.64	124.39	52.25	3.381		
4,395.00	4,391.74	4,399.74	4,399.74	37.19	15.57	-64.07	130.00	-0.40	171.94	119.66	52.28	3.289		
4,400.00	4,396.55	4,404.55	4,404.55	37.19	15.59	-64.60	130.00	-0.40	171.32	119.03	52.29	3.277		
4,438.00	4,432.56	4,440.56	4,440.56	37.19	15.72	-69.07	130.00	-0.40	166.34	113.95	52.39	3.175		
4,481.00	4,472.05	4,480.05	4,480.05	37.20	15.86	-76.97	130.00	-0.40	161.03	108.28	52.74	3.053		
4,500.00	4,489.02	4,497.02	4,497.02	37.21	15.92	-81.61	130.00	-0.40	159.27	106.31	52.96	3.007		
4,523.00	4,509.15	4,517.15	4,517.15	37.22	15.99	-87.05	130.00	-0.40	158.03	104.86	53.16	2.972		
4,533.59	4,518.25	4,526.25	4,526.25	37.22	16.03	-90.00	130.00	-0.40	157.87	104.64	53.23	2.966 ES, SF		
4,566.00	4,545.45	4,553.45	4,553.45	37.24	16.12	-98.49	130.00	-0.40	159.47	106.29	53.18	2.969		
4,600.00	4,572.72	4,580.72	4,580.72	37.26	16.22	-105.67	130.00	-0.40	164.81	112.08	52.73	3.125		
4,608.00	4,578.92	4,586.92	4,586.92	37.27	16.24	-107.46	130.00	-0.40	166.63	114.07	52.56	3.170		
4,651.00	4,610.56	4,618.56	4,618.56	37.31	16.36	-113.97	130.00	-0.40	180.04	128.59	51.44	3.500		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #50H - OH - Plan #2 11-18-15													Offset Site Error:	0.00 usft
Survey Program: O-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum		Separation		Warning	
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Separation	Factor			
Depth	Depth	Depth	Depth	(usft)	(usft)	Toolface	+N/-S	Centres	Ellipses	(usft)				
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)				
4,694.00	4,639.01	4,647.01	4,647.01	37.37	16.46	-117.57	130.00	-0.40	199.11	148.84	50.27	3.961		
4,700.00	4,642.70	4,650.70	4,650.70	37.38	16.47	-117.81	130.00	-0.40	202.18	152.04	50.14	4.032		
4,736.00	4,663.33	4,671.33	4,671.33	37.46	16.55	-118.67	130.00	-0.40	222.40	172.89	49.50	4.493		
4,779.00	4,684.73	4,692.73	4,692.73	37.58	16.62	-117.06	130.00	-0.40	249.60	199.90	49.70	5.022		
4,800.00	4,694.04	4,702.04	4,702.04	37.66	16.66	-116.33	130.00	-0.40	263.73	213.85	49.87	5.288		
4,821.00	4,702.68	4,710.68	4,710.68	37.73	16.69	-115.38	130.00	-0.40	278.32	228.18	50.14	5.551		
4,864.00	4,718.51	4,726.51	4,726.51	37.93	16.74	-115.30	130.00	-0.40	309.94	259.75	50.18	6.176		
4,900.00	4,729.77	4,737.77	4,737.77	38.13	16.78	-113.67	130.00	-0.40	338.16	287.36	50.80	6.657		
4,906.00	4,731.45	4,739.45	4,739.45	38.16	16.79	-113.31	130.00	-0.40	343.00	292.06	50.94	6.734		
4,949.00	4,741.19	4,749.19	4,749.19	38.43	16.83	-107.33	130.00	-0.40	378.86	325.93	52.93	7.158		
4,991.00	4,747.73	4,755.73	4,755.73	38.74	16.85	-104.94	130.00	-0.40	415.46	361.63	53.83	7.718		
5,000.00	4,748.90	4,756.90	4,756.90	38.82	16.85	-104.59	130.00	-0.40	423.46	369.47	53.99	7.844		
5,036.00	4,752.94	4,760.94	4,760.94	39.11	16.87	-102.72	130.00	-0.40	455.97	401.28	54.69	8.337		
5,078.00	4,756.20	4,764.20	4,764.20	39.49	16.88	-98.34	130.00	-0.40	494.69	438.86	55.82	8.862		
5,100.00	4,757.41	4,765.41	4,765.41	39.71	16.88	-98.08	130.00	-0.40	515.20	459.12	56.08	9.187		
5,121.00	4,758.48	4,766.48	4,766.48	39.91	16.89	-97.78	130.00	-0.40	534.90	478.57	56.32	9.497		
5,200.00	4,762.13	4,770.13	4,770.13	40.81	16.90	-98.14	130.00	-0.40	609.85	552.67	57.18	10.666		
5,248.00	4,764.13	4,772.13	4,772.13	41.35	16.91	-98.24	130.00	-0.40	655.91	598.20	57.71	11.366		
5,300.00	4,766.13	4,774.13	4,774.13	42.05	16.91	-98.23	130.00	-0.40	706.14	647.73	58.41	12.089		
5,376.00	4,768.71	4,776.71	4,776.71	43.07	16.92	-98.00	130.00	-0.40	780.03	720.57	59.46	13.118		
5,400.00	4,769.47	4,777.47	4,777.47	43.44	16.93	-98.37	130.00	-0.40	803.47	743.69	59.77	13.442		
5,500.00	4,772.61	4,780.61	4,780.61	44.96	16.94	-100.12	130.00	-0.40	901.58	840.58	61.01	14.779		
5,504.00	4,772.73	4,780.73	4,780.73	45.02	16.94	-100.19	130.00	-0.40	905.52	844.47	61.05	14.832		
5,600.00	4,775.31	4,783.31	4,783.31	46.64	16.95	-100.25	136.57	964.66	988.95	968.61	20.34	48.630		
5,631.00	4,775.95	4,783.95	4,783.95	47.17	16.96	-100.23	136.78	995.65	989.04	968.23	20.81	47.531		
5,700.00	4,777.14	4,785.14	4,785.14	48.43	16.97	-100.19	137.25	1,064.63	989.40	967.51	21.89	45.203		
5,759.00	4,777.96	4,785.96	4,785.96	49.51	16.98	-100.20	137.86	1,123.61	989.80	967.01	22.79	43.427		
5,800.00	4,778.39	4,786.39	4,786.39	50.30	16.99	-100.23	137.93	1,164.60	990.15	966.74	23.41	42.298		
5,886.00	4,778.84	4,786.84	4,786.84	51.97	16.99	-100.37	138.52	1,250.52	991.07	966.44	24.64	40.225		
5,900.00	4,778.85	4,786.85	4,786.85	52.26	16.99	-100.41	138.61	1,264.50	991.27	966.44	24.83	39.927		
6,000.00	4,777.71	4,785.71	4,785.71	54.30	17.00	-100.63	139.29	1,364.37	993.98	967.75	26.23	37.894		
6,014.00	4,777.39	4,785.39	4,785.39	54.58	17.00	-100.66	139.39	1,378.34	994.54	968.10	26.43	37.623		
6,100.00	4,775.64	4,783.64	4,783.64	56.42	17.01	-100.78	139.98	1,464.24	997.88	970.18	27.71	36.016		
6,142.00	4,775.05	4,783.05	4,783.05	57.32	17.01	-100.81	140.26	1,506.20	999.35	970.98	28.37	35.230		
6,200.00	4,774.48	4,782.48	4,782.48	58.60	17.02	-100.82	140.66	1,564.16	1,001.17	971.84	29.33	34.140		
6,269.00	4,774.16	4,782.16	4,782.16	60.14	17.02	-100.82	141.13	1,633.11	1,003.00	972.51	30.49	32.898		
6,300.00	4,774.16	4,782.16	4,782.16	60.84	17.02	-100.82	141.34	1,664.10	1,003.67	972.64	31.03	32.344		
6,397.00	4,774.83	4,782.83	4,782.83	63.06	17.03	-100.90	142.00	1,761.04	1,004.79	972.18	32.60	30.818		
6,400.00	4,774.87	4,782.87	4,782.87	63.13	17.03	-100.90	142.02	1,764.04	1,004.80	972.15	32.65	30.774		
6,500.00	4,777.46	4,785.46	4,785.46	65.46	17.04	-101.11	142.70	1,863.93	1,003.74	969.56	34.18	29.366		
6,525.00	4,778.52	4,786.52	4,786.52	66.04	17.04	-101.17	142.87	1,888.89	1,003.04	968.49	34.56	29.026		
6,600.00	4,781.65	4,789.65	4,789.65	67.83	17.05	-101.36	143.38	1,963.78	1,001.01	965.41	35.60	28.117		
6,653.00	4,783.54	4,791.54	4,791.54	69.09	17.05	-101.48	143.74	2,016.71	999.93	963.58	36.35	27.508		
6,700.00	4,784.98	4,792.98	4,792.98	70.23	17.06	-101.58	144.06	2,063.66	999.25	962.23	37.03	26.988		
6,781.00	4,786.89	4,794.89	4,794.89	72.20	17.07	-101.72	144.61	2,144.61	998.75	960.53	38.22	26.130		
6,789.03	4,787.04	4,795.04	4,795.04	72.40	17.07	-101.73	144.66	2,152.64	998.75	960.40	38.34	26.047		
6,800.00	4,787.24	4,795.24	4,795.24	72.67	17.07	-101.75	144.74	2,163.60	998.76	960.25	38.51	25.935		
6,900.00	4,788.40	4,796.40	4,796.40	75.14	17.08	-101.85	145.42	2,263.56	999.52	959.47	40.06	24.953		
6,909.00	4,788.45	4,796.45	4,796.45	75.37	17.08	-101.86	145.48	2,272.56	999.65	959.45	40.20	24.868		
7,000.00	4,789.27	4,797.27	4,797.27	77.65	17.09	-101.93	146.10	2,363.51	1,000.57	958.90	41.67	24.011		
7,037.00	4,789.80	4,797.80	4,797.80	78.58	17.09	-101.99	146.35	2,400.48	1,000.69	958.45	42.23	23.694		
7,100.00	4,791.06	4,800.06	4,800.06	80.17	17.10	-102.11	146.78	2,463.43	1,000.49	957.31	43.18	23.170		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 usft	
NFE Federal COM - #50H - OH - Plan #2 11-18-15													Offset Well Error: 0.00 usft	
Survey Program: O-PHX+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)				
7,164.00	4,792.90	8,070.50	5,791.30	81.79	73.27	-172.23	147.22	2,527.38	999.74	955.59	44.15	22.645		
7,200.00	4,794.08	8,106.48	5,792.08	82.72	74.26	-172.29	147.46	2,563.35	999.17	954.49	44.68	22.364		
7,292.00	4,797.03	8,198.42	5,794.05	85.07	76.80	-172.46	148.09	2,655.27	997.80	951.77	46.03	21.679		
7,300.00	4,797.28	8,206.42	5,794.23	85.28	77.02	-172.47	148.14	2,663.26	997.69	951.55	46.14	21.622		
7,400.00	4,799.87	8,306.38	5,796.37	87.86	79.79	-172.64	148.82	2,763.20	996.90	949.28	47.61	20.938		
7,420.00	4,800.27	8,326.37	5,796.80	88.38	80.35	-172.67	148.96	2,783.19	996.87	948.96	47.91	20.807		
7,425.99	4,800.38	8,332.36	5,796.93	88.54	80.51	-172.67	149.00	2,789.17	996.87	948.86	48.00	20.767		
7,500.00	4,801.63	8,406.36	5,798.52	90.47	82.57	-172.75	149.50	2,863.15	997.05	947.91	49.14	20.290		
7,547.00	4,802.26	8,453.35	5,799.53	91.70	83.88	-172.79	149.82	2,910.14	997.37	947.49	49.88	19.994		
7,600.00	4,803.12	8,506.35	5,800.67	93.09	85.36	-172.81	150.18	2,963.12	997.60	946.82	50.77	19.648		
7,675.00	4,805.06	8,581.35	5,802.28	95.06	87.45	-172.84	150.69	3,038.10	997.20	945.16	52.04	19.163		
7,700.00	4,805.81	8,606.35	5,802.82	95.73	88.15	-172.86	150.86	3,063.09	996.96	944.52	52.44	19.013		
7,776.15	4,807.75	8,682.49	5,804.46	97.74	90.28	-172.87	151.38	3,139.22	996.65	942.97	53.68	18.568		
7,800.00	4,808.24	8,706.35	5,804.97	98.38	90.95	-172.87	151.55	3,163.06	996.68	942.61	54.07	18.433		
7,803.00	4,808.30	8,709.35	5,805.04	98.46	91.03	-172.87	151.57	3,166.06	996.68	942.56	54.12	18.416		
7,900.00	4,809.77	8,806.33	5,807.12	101.05	93.75	-172.82	152.23	3,263.03	997.46	941.67	55.79	17.879		
7,930.00	4,810.07	8,836.32	5,807.76	101.85	94.59	-172.79	152.43	3,293.01	997.89	941.57	56.33	17.716		
8,000.00	4,811.35	8,906.30	5,809.27	103.72	96.55	-172.69	152.91	3,362.97	998.33	940.56	57.77	17.281		
8,058.00	4,813.42	8,964.28	5,810.51	105.28	98.18	-172.61	153.30	3,420.94	997.65	938.71	58.94	16.926		
8,100.00	4,815.23	9,006.27	5,811.42	106.41	99.36	-172.57	153.59	3,462.91	996.85	937.13	59.73	16.690		
8,186.00	4,818.78	9,092.22	5,813.26	108.73	101.78	-172.44	154.17	3,548.84	995.45	934.06	61.39	16.215		
8,200.00	4,819.35	9,108.21	5,813.57	109.11	102.17	-172.41	154.27	3,562.83	995.24	933.56	61.68	16.136		
8,300.00	4,823.97	9,206.16	5,815.71	111.81	104.98	-172.26	154.95	3,662.75	993.03	929.42	63.61	15.611		
8,314.00	4,824.70	9,220.16	5,816.01	112.19	105.38	-172.25	155.04	3,676.74	992.62	928.76	63.87	15.542		
8,400.00	4,829.00	9,306.12	5,817.86	114.52	107.80	-172.20	155.63	3,762.68	990.27	924.86	65.41	15.140		
8,442.00	4,830.95	9,348.10	5,818.76	115.66	108.99	-172.17	155.91	3,804.66	989.28	923.11	66.17	14.951		
8,500.00	4,833.63	9,406.08	5,820.01	117.24	110.62	-172.13	156.31	3,862.63	987.92	920.70	67.22	14.698		
8,570.00	4,836.98	9,476.06	5,821.51	119.14	112.60	-172.11	156.79	3,932.58	986.06	917.65	68.42	14.413		
8,600.00	4,838.43	9,506.05	5,822.16	119.96	113.45	-172.12	156.99	3,962.56	985.24	916.32	68.92	14.295		
8,698.00	4,842.90	9,604.02	5,824.26	122.64	116.21	-172.12	157.66	4,060.51	982.88	912.25	70.62	13.918		
8,700.00	4,842.99	9,606.02	5,824.31	122.69	116.27	-172.12	157.67	4,062.51	982.83	912.18	70.66	13.910		
8,800.00	4,846.99	9,706.00	5,826.46	125.43	119.10	-172.08	158.35	4,162.46	981.07	908.63	72.44	13.543		
8,825.00	4,847.88	9,730.99	5,826.99	126.12	119.81	-172.07	158.52	4,187.45	980.76	907.86	72.90	13.454		
8,900.00	4,850.46	9,805.98	5,828.61	128.18	121.93	-172.01	159.03	4,262.42	979.90	905.62	74.28	13.192		
8,953.00	4,852.24	9,858.98	5,829.74	129.64	123.43	-171.98	159.39	4,315.41	979.32	904.08	75.24	13.016		
9,000.00	4,853.77	9,905.98	5,830.75	130.93	124.76	-171.96	159.71	4,362.39	978.84	902.76	76.08	12.866		
9,081.00	4,856.26	9,986.97	5,832.50	133.16	127.06	-171.94	160.26	4,443.37	978.14	900.62	77.52	12.618		
9,100.00	4,856.82	10,005.97	5,832.90	133.69	127.60	-171.93	160.39	4,462.36	978.00	900.14	77.86	12.561		
9,200.00	4,859.79	10,105.96	5,835.05	136.45	130.43	-171.89	161.07	4,562.33	977.30	897.60	79.70	12.262		
9,208.00	4,860.03	10,113.96	5,835.23	136.67	130.66	-171.88	161.13	4,570.33	977.25	897.40	79.85	12.238		
9,300.00	4,862.58	10,205.95	5,837.20	139.22	133.27	-171.80	161.76	4,662.29	976.91	895.28	81.62	11.968		
9,317.62	4,863.03	10,223.56	5,837.58	139.71	133.77	-171.78	161.88	4,679.90	976.90	894.92	81.98	11.917		
9,336.00	4,863.49	10,241.94	5,837.98	140.21	134.29	-171.75	162.00	4,698.26	976.91	894.56	82.35	11.863		
9,400.00	4,865.14	10,305.92	5,839.35	141.99	136.11	-171.65	162.44	4,762.24	976.81	893.16	83.65	11.678		
9,464.00	4,866.95	10,369.92	5,840.73	143.76	137.93	-171.63	162.87	4,826.22	976.38	891.60	84.78	11.517		
9,500.00	4,867.95	10,405.92	5,841.50	144.76	138.95	-171.64	163.12	4,862.21	976.13	890.75	85.38	11.433		
9,534.19	4,868.77	10,440.11	5,842.24	145.71	139.92	-171.65	163.35	4,896.39	976.05	890.09	85.96	11.355		
9,592.00	4,869.86	10,497.92	5,843.48	147.32	141.56	-171.64	163.74	4,954.18	976.27	889.28	86.99	11.223		
9,600.00	4,869.98	10,505.92	5,843.65	147.54	141.79	-171.63	163.80	4,962.18	976.34	889.21	87.13	11.205		
9,700.00	4,870.76	10,605.88	5,845.80	150.33	144.63	-171.53	164.48	5,062.11	978.02	889.01	89.01	10.988		
9,720.00	4,870.75	10,625.86	5,846.23	150.89	145.20	-171.50	164.61	5,082.10	978.55	889.15	89.40	10.946		
9,800.00	4,870.61	10,705.80	5,847.95	153.12	147.47	-171.37	165.16	5,162.01	980.78	889.66	91.12	10.764		

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #46H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3770.00usft (Capstar 119)
Reference Site:	NFE Federal COM	MD Reference:	KB @ 3770.00usft (Capstar 119)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#46H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH / Job #1514748	Database:	Compass 5000 GCR
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design NFE Federal COM - #50H - OH - Plan #2 11-18-15													Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation			
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor	Warning	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
9,827.00	4,870.56	10,732.78	5,848.53	153.87	148.24	-171.32	165.34	5,188.98	981.54	889.83	91.70	10.703		

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