



NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 25 2017

RECEIVED

Apache Corporation

Eddy County, NM (NAD 83 NME)

Palmillo 14-15 State

#2H 30-015-44043

OH / Job #61176

Surveys (H&P 482)

Anticollision Report

01 June, 2017

Please provide signature
page for directional survey





Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmilla 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
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 10,000.00 u	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Program: Date 6/1/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	6,500.00	Phoenix Gyro Surveys (OH / Job #61176)	SPT_GTD	Continuous north-seeking gyro
6,500.00	12,300.00	Phoenix MWD Surveys (OH / Job #61176)	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
Atlantic State						
#1 - OH - Surveys	8,321.86	7,344.86	2,847.89	2,612.38	12.092	CC
#1 - OH - Surveys	8,400.00	7,351.38	2,849.70	2,612.33	12.005	ES
#1 - OH - Surveys	9,400.00	7,439.08	3,032.46	2,769.48	11.531	SF
East Millman Unit						
#218 - OH - Surveys	10,606.69	7,448.93	367.15	127.11	1.530	CC, ES, SF
Palmilla 14 State Com						
#1H - WB1/Job #1411057 - Surveys (Pioneer 28)	10,100.00	9,627.35	1,617.01	1,368.59	6.509	CC
#1H - WB1/Job #1411057 - Surveys (Pioneer 28)	12,300.00	11,874.00	1,632.67	1,159.15	3.447	ES, SF
#4H - WB1/Job #1411413 - Surveys (Pioneer 28)	8,186.81	7,567.00	4,130.34	4,076.75	77.075	CC
#4H - WB1/Job #1411413 - Surveys (Pioneer 28)	12,300.00	11,759.00	4,213.47	3,743.50	8.965	ES, SF

Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error: 0.00 usft
Survey Program: 378-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)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	13.00	0.00	0.00	0.12	22.93	3,017.60	1,276.61	3,276.53				
100.00	100.00	113.00	100.00	0.07	1.02	-123.45	3,017.60	1,276.61	3,276.77	3,275.68	1.08	3,026.979	
200.00	200.00	213.00	200.00	0.24	1.92	-139.13	3,017.60	1,276.61	3,277.26	3,275.12	2.16	1,517.983	
300.00	299.99	312.99	299.99	0.42	2.82	-112.95	3,017.60	1,276.61	3,277.81	3,274.58	3.24	1,013.228	
400.00	399.98	412.98	399.98	0.60	4.09	-129.06	3,017.60	1,276.61	3,278.51	3,273.82	4.68	700.125	
500.00	499.97	512.97	499.97	0.77	5.99	-161.67	3,017.60	1,276.61	3,279.83	3,273.07	6.76	484.990	
600.00	599.95	612.95	599.95	0.95	7.89	-150.48	3,017.60	1,276.61	3,281.80	3,272.96	8.84	371.211	
700.00	699.92	712.92	699.92	1.13	9.79	-148.75	3,017.60	1,276.61	3,283.83	3,272.91	10.92	300.761	
800.00	799.89	812.89	799.89	1.31	11.70	-143.72	3,017.60	1,276.61	3,285.87	3,272.67	13.00	252.809	
900.00	899.87	912.87	899.87	1.48	13.79	-148.81	3,017.60	1,276.61	3,287.55	3,272.29	15.26	215.394	
1,000.00	999.84	1,012.84	999.84	1.66	16.12	-154.11	3,017.60	1,276.61	3,289.83	3,271.86	17.77	185.127	
1,100.00	1,099.78	1,112.78	1,099.78	1.84	18.45	-154.21	3,017.60	1,276.61	3,292.67	3,272.40	20.27	162.453	
1,200.00	1,199.88	1,212.69	1,199.68	2.02	20.78	-148.58	3,017.60	1,276.61	3,296.53	3,273.76	22.77	144.749	
1,300.00	1,299.58	1,312.58	1,299.58	2.19	23.10	-143.85	3,017.60	1,276.61	3,300.36	3,275.08	25.28	130.556	
1,400.00	1,399.48	1,358.00	1,344.98	2.37	24.16	-147.58	3,017.60	1,276.61	3,304.72	3,278.20	26.51	124.638	

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



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Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 378-INC-ONLY-Offset Well													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)						
1,500.00	1,499.34	1,512.36	1,499.34	2.55	28.28	-153.58	3,017.60	1,276.61	3,308.61	3,277.82	30.80	107.439		
1,600.00	1,599.21	1,612.23	1,599.21	2.73	30.94	-148.47	3,017.60	1,276.61	3,312.98	3,279.34	33.64	98.480		
1,700.00	1,699.08	1,712.10	1,699.08	2.92	33.60	-151.89	3,017.60	1,276.61	3,317.34	3,280.87	36.47	90.960		
1,800.00	1,798.96	1,810.00	1,798.96	3.10	36.21	-154.09	3,017.60	1,276.61	3,321.70	3,282.53	39.26	84.604		
1,900.00	1,898.83	1,911.95	1,898.83	3.28	38.77	-150.70	3,017.60	1,276.61	3,326.18	3,284.19	41.99	79.210		
2,000.00	1,998.74	2,011.85	1,998.74	3.46	41.28	-142.13	3,017.60	1,276.61	3,329.86	3,285.15	44.70	74.489		
2,100.00	2,098.72	2,111.83	2,098.72	3.63	43.79	-28.42	3,017.60	1,276.61	3,330.68	3,283.28	47.40	70.274		
2,200.00	2,198.69	2,211.80	2,198.69	3.80	46.30	26.64	3,017.60	1,276.61	3,328.46	3,278.41	50.05	66.507		
2,300.00	2,298.59	2,291.00	2,277.63	3.97	48.29	34.17	3,017.60	1,276.61	3,324.71	3,272.53	52.18	63.715		
2,400.00	2,398.43	2,411.60	2,398.43	4.14	51.20	34.31	3,017.60	1,276.61	3,320.05	3,264.80	55.24	60.098		
2,500.00	2,498.24	2,511.41	2,498.24	4.30	53.61	34.97	3,017.60	1,276.61	3,315.01	3,257.19	57.81	57.340		
2,600.00	2,598.05	2,611.22	2,598.05	4.47	56.02	29.77	3,017.60	1,276.61	3,309.75	3,249.37	60.39	54.610		
2,700.00	2,697.85	2,711.02	2,697.85	4.65	58.43	27.42	3,017.60	1,276.61	3,304.18	3,241.23	62.95	52.492		
2,800.00	2,797.65	2,786.00	2,772.78	4.82	60.24	35.52	3,017.60	1,276.61	3,298.86	3,233.81	64.95	50.787		
2,900.00	2,897.44	2,910.66	2,897.44	4.99	63.01	38.02	3,017.60	1,276.61	3,293.58	3,225.71	67.87	48.528		
3,000.00	2,997.21	3,010.44	2,997.21	5.17	65.22	33.44	3,017.60	1,276.61	3,288.09	3,217.85	70.24	46.810		
3,100.00	3,097.00	3,110.23	3,097.00	5.34	67.43	27.24	3,017.60	1,276.61	3,282.53	3,209.90	72.63	45.196		
3,200.00	3,196.82	3,210.16	3,196.82	5.52	69.64	14.90	3,017.60	1,276.61	3,279.15	3,204.03	75.12	43.651		
3,300.00	3,296.61	3,310.15	3,296.61	5.69	71.86	39.44	3,017.60	1,276.61	3,277.94	3,200.43	77.51	42.290		
3,400.00	3,396.60	3,400.00	3,386.74	5.86	73.85	35.99	3,017.60	1,276.61	3,277.00	3,197.32	79.68	41.127		
3,500.00	3,496.69	3,510.15	3,496.69	6.04	76.51	35.93	3,017.60	1,276.61	3,275.93	3,193.42	82.51	39.704		
3,600.00	3,596.68	3,610.14	3,596.68	6.21	78.93	10.03	3,017.60	1,276.61	3,274.55	3,189.45	85.10	38.480		
3,700.00	3,696.68	3,710.13	3,696.68	6.38	81.34	57.41	3,017.60	1,276.61	3,273.58	3,185.99	87.69	37.330		
3,800.00	3,796.67	3,810.13	3,796.67	6.56	83.76	19.46	3,017.60	1,276.61	3,273.07	3,182.79	90.28	36.253		
3,886.26	3,883.13	3,894.00	3,880.70	6.71	85.79	70.73	3,017.60	1,276.61	3,272.77	3,180.31	92.46	35.396		
3,900.00	3,896.67	3,894.00	3,880.70	6.73	85.79	76.87	3,017.60	1,276.61	3,272.79	3,180.30	92.49	35.387		
4,000.00	3,996.67	4,010.17	3,996.67	6.90	88.95	-164.62	3,017.60	1,276.61	3,272.90	3,177.08	95.82	34.157		
4,100.00	4,096.67	4,110.17	4,096.67	7.08	91.67	35.38	3,017.60	1,276.61	3,272.92	3,174.20	98.72	33.155		
4,179.96	4,175.93	4,189.23	4,175.93	7.22	93.82	90.00	3,017.60	1,276.61	3,272.75	3,171.74	101.01	32.401		
4,200.00	4,186.67	4,210.17	4,186.67	7.25	94.39	97.60	3,017.60	1,276.61	3,272.78	3,171.15	101.61	32.208		
4,300.00	4,286.67	4,310.16	4,286.67	7.43	97.11	127.07	3,017.60	1,276.61	3,273.03	3,168.52	104.51	31.318		
4,400.00	4,386.66	4,394.00	4,380.65	7.60	99.40	-146.96	3,017.60	1,276.61	3,273.54	3,166.58	106.97	30.604		
4,500.00	4,486.66	4,510.22	4,486.66	7.77	102.93	-150.90	3,017.60	1,276.61	3,273.94	3,163.26	110.68	29.581		
4,600.00	4,586.66	4,610.22	4,586.66	7.95	105.98	-118.23	3,017.60	1,276.61	3,274.20	3,160.30	113.90	28.747		
4,700.00	4,686.66	4,710.22	4,686.66	8.12	109.02	150.34	3,017.60	1,276.61	3,274.51	3,157.40	117.12	27.960		
4,800.00	4,786.66	4,806.00	4,792.56	8.29	111.94	-160.35	3,017.60	1,276.61	3,275.21	3,155.01	120.20	27.247		
4,900.00	4,886.66	4,910.29	4,886.66	8.47	115.35	-138.60	3,017.60	1,276.61	3,275.94	3,152.15	123.79	26.463		
5,000.00	4,986.65	4,980.00	4,966.52	8.64	117.63	161.39	3,017.60	1,276.61	3,276.59	3,150.34	126.25	25.954		
5,100.00	5,086.65	4,980.00	4,966.52	8.82	117.63	-171.37	3,017.60	1,276.61	3,279.72	3,153.30	128.42	25.943		
5,184.28	5,181.13	5,204.61	5,191.13	8.98	125.50	113.19	3,017.60	1,276.61	3,277.59	3,143.13	134.45	24.377		
5,200.00	5,186.85	5,210.33	5,196.85	8.99	125.70	99.59	3,017.60	1,276.61	3,277.59	3,142.93	134.67	24.339		
5,292.54	5,289.39	5,289.00	5,275.42	9.15	128.45	60.43	3,017.60	1,276.61	3,277.44	3,139.86	137.58	23.822		
5,300.00	5,296.85	5,289.00	5,275.42	9.17	128.45	59.71	3,017.60	1,276.61	3,277.45	3,139.86	137.59	23.820		
5,400.00	5,396.84	5,410.42	5,396.84	9.34	132.99	57.63	3,017.60	1,276.61	3,278.89	3,134.58	142.31	23.026		
5,454.62	5,451.47	5,444.00	5,430.36	9.43	134.25	45.22	3,017.60	1,276.61	3,276.65	3,132.99	143.66	22.808		
5,500.00	5,496.84	5,444.00	5,430.36	9.51	134.25	34.74	3,017.60	1,276.61	3,278.83	3,133.20	143.74	22.798		
5,600.00	5,596.83	5,567.00	5,583.29	9.69	139.65	15.62	3,017.60	1,276.61	3,275.09	3,125.79	149.30	21.936		
5,700.00	5,696.82	5,710.53	5,696.82	9.86	143.54	-18.80	3,017.60	1,276.61	3,273.76	3,120.39	153.38	21.345		
5,759.74	5,756.56	5,752.00	5,738.25	9.97	144.97	-13.21	3,017.60	1,276.61	3,270.36	3,118.45	154.91	21.131		
5,800.00	5,796.82	5,752.00	5,738.25	10.04	144.97	0.80	3,017.60	1,276.61	3,273.56	3,118.68	154.99	21.123		
5,900.00	5,896.82	5,808.00	5,884.19	10.21	150.85	-39.96	3,017.60	1,276.61	3,272.94	3,111.90	161.04	20.324		
6,000.00	5,996.82	6,002.00	5,988.15	10.38	154.41	-22.92	3,017.60	1,276.61	3,272.70	3,107.93	164.77	19.862		

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Survey Program: 378-INC-ONLY-Offset Well													Offset Well Error:	0.00 usft
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	Warning	
6,044.56	6,041.37	6,055.23	6,041.37	10.46	156.37	119.68	3,017.60	1,276.61	3,272.63	3,105.62	166.80	19.920		
6,100.00	6,096.82	6,096.00	6,082.11	10.56	157.86	140.46	3,017.60	1,276.61	3,272.67	3,104.47	168.39	19.436		
6,200.00	6,196.81	6,190.00	6,176.07	10.73	161.32	-156.43	3,017.60	1,276.61	3,273.85	3,101.83	172.02	19.032		
6,300.00	6,296.80	6,310.73	6,296.80	10.91	165.77	157.56	3,017.60	1,276.61	3,275.02	3,098.38	176.64	18.541		
6,400.00	6,396.79	6,344.00	6,330.02	11.08	168.99	173.22	3,017.60	1,276.61	3,277.43	3,099.42	178.01	18.412		
6,500.00	6,496.77	6,493.00	6,478.96	11.25	172.67	173.92	3,017.60	1,276.61	3,278.76	3,094.88	183.87	17.832		
6,600.00	6,596.75	6,591.00	6,576.91	11.34	176.40	163.27	3,017.60	1,276.61	3,280.83	3,093.15	187.67	17.482		
6,700.00	6,696.72	6,682.00	6,667.88	11.39	179.87	-100.35	3,017.60	1,276.61	3,282.61	3,091.57	191.24	17.166		
6,800.00	6,796.36	6,776.00	6,761.84	11.41	183.58	-58.74	3,017.60	1,276.61	3,280.25	3,085.96	194.28	16.884		
6,900.00	6,892.58	6,868.00	6,853.79	11.46	187.20	-63.57	3,017.60	1,276.61	3,266.51	3,070.48	196.03	16.563		
7,000.00	6,983.42	6,997.62	6,983.42	11.53	192.32	-66.83	3,017.60	1,276.61	3,248.11	3,047.77	200.34	16.213		
7,100.00	7,088.57	7,013.00	6,998.73	11.67	192.93	-65.79	3,017.60	1,276.61	3,224.54	3,025.27	199.27	16.182		
7,200.00	7,147.09	7,161.38	7,147.09	11.96	198.98	-83.04	3,017.60	1,276.61	3,191.70	2,990.97	200.73	15.900		
7,300.00	7,213.55	7,187.00	7,172.65	12.45	200.02	-64.87	3,017.60	1,276.61	3,147.04	2,947.01	200.04	15.732		
7,400.00	7,265.52	7,279.87	7,265.52	13.21	203.92	-75.81	3,017.60	1,276.61	3,099.81	2,887.01	211.80	14.531		
7,500.00	7,289.01	7,305.00	7,290.58	14.30	204.98	-82.61	3,017.60	1,276.61	3,055.63	2,838.02	217.61	14.042		
7,600.00	7,318.69	7,305.00	7,290.58	15.65	204.98	-87.08	3,017.60	1,276.61	3,015.89	2,795.55	220.34	13.687		
7,700.00	7,323.61	7,338.03	7,323.61	17.22	206.37	-89.88	3,017.60	1,276.61	2,978.15	2,755.57	223.58	13.325		
7,800.00	7,323.00	7,337.41	7,323.00	18.92	206.34	-90.35	3,017.60	1,276.61	2,943.51	2,718.26	225.25	13.068		
7,900.00	7,320.73	7,305.00	7,290.58	20.72	204.98	-89.88	3,017.60	1,276.61	2,911.21	2,685.52	225.70	12.899		
8,000.00	7,318.17	7,305.00	7,290.58	22.62	204.98	-89.72	3,017.60	1,276.61	2,883.82	2,656.24	227.57	12.672		
8,100.00	7,318.02	7,305.00	7,290.58	24.58	204.98	-89.28	3,017.60	1,276.61	2,863.95	2,634.49	229.46	12.481		
8,200.00	7,322.06	7,336.47	7,322.06	26.60	206.30	-89.75	3,017.60	1,276.61	2,852.36	2,619.63	232.73	12.256		
8,300.00	7,328.76	7,343.18	7,328.76	28.68	206.59	-89.95	3,017.60	1,276.61	2,848.02	2,613.03	234.99	12.120		
8,321.86	7,330.45	7,344.86	7,330.45	29.12	206.66	-90.00	3,017.60	1,276.61	2,847.89	2,612.38	235.51	12.092 CC		
8,400.00	7,336.97	7,351.38	7,336.97	30.75	206.93	-90.23	3,017.60	1,276.61	2,849.70	2,612.33	237.37	12.005 ES		
8,500.00	7,347.56	7,361.68	7,347.56	32.85	207.38	-90.51	3,017.60	1,276.61	2,856.13	2,616.21	239.91	11.905		
8,600.00	7,357.61	7,367.00	7,352.55	34.99	207.59	-90.56	3,017.60	1,276.61	2,866.18	2,623.92	242.26	11.831		
8,700.00	7,366.51	7,367.00	7,352.55	37.14	207.59	-90.45	3,017.60	1,276.61	2,879.95	2,635.47	244.48	11.780		
8,800.00	7,375.09	7,367.00	7,352.55	39.31	207.59	-90.31	3,017.60	1,276.61	2,894.84	2,648.20	248.74	11.733		
8,900.00	7,382.80	7,367.00	7,352.55	41.51	207.59	-90.17	3,017.60	1,276.61	2,912.07	2,663.10	248.97	11.696		
9,000.00	7,390.22	7,367.00	7,352.55	43.71	207.59	-90.25	3,017.60	1,276.61	2,931.66	2,680.46	251.21	11.670		
9,100.00	7,398.81	7,413.25	7,398.81	45.92	209.42	-91.16	3,017.60	1,276.61	2,953.18	2,697.95	255.23	11.571		
9,200.00	7,407.78	7,422.23	7,407.78	48.14	209.78	-91.46	3,017.60	1,276.61	2,977.33	2,719.53	257.80	11.549		
9,300.00	7,417.16	7,431.61	7,417.16	50.36	210.15	-91.42	3,017.60	1,276.61	3,003.56	2,743.25	260.41	11.534		
9,400.00	7,424.63	7,439.08	7,424.63	52.60	210.45	-91.14	3,017.60	1,276.61	3,032.46	2,769.48	262.98	11.531 SF		
9,500.00	7,430.92	7,445.37	7,430.92	54.84	210.70	-91.32	3,017.60	1,276.61	3,064.48	2,799.05	265.43	11.545		
9,600.00	7,437.64	7,452.00	7,437.64	57.08	210.96	-91.64	3,017.60	1,276.61	3,100.80	2,832.93	267.87	11.578		
9,700.00	7,443.77	7,452.00	7,437.64	59.33	210.96	-91.31	3,017.60	1,276.61	3,140.39	2,870.22	270.17	11.624		
9,800.00	7,449.69	7,452.00	7,437.64	61.59	210.96	-91.50	3,017.60	1,276.61	3,181.79	2,909.37	272.43	11.679		
9,900.00	7,457.20	7,452.00	7,437.64	63.85	210.96	-92.07	3,017.60	1,276.61	3,225.86	2,951.28	274.58	11.748		
10,000.00	7,466.07	7,452.00	7,437.64	66.10	210.96	-92.34	3,017.60	1,276.61	3,272.87	2,996.09	278.78	11.825		
10,100.00	7,475.14	7,452.00	7,437.64	68.36	210.96	-92.24	3,017.60	1,276.61	3,322.61	3,043.56	279.04	11.907		
10,200.00	7,483.36	7,452.00	7,437.64	70.62	210.96	-92.00	3,017.60	1,276.61	3,375.37	3,094.07	281.31	11.999		
10,300.00	7,490.86	7,505.36	7,490.86	72.89	212.95	-92.77	3,017.60	1,276.61	3,430.94	3,145.56	285.38	12.022		
10,400.00	7,497.41	7,511.90	7,497.41	75.16	213.19	-92.85	3,017.60	1,276.61	3,489.05	3,201.20	287.86	12.121		
10,500.00	7,504.81	7,519.31	7,504.81	77.43	213.47	-93.73	3,017.60	1,276.61	3,549.43	3,258.27	290.15	12.233		
10,600.00	7,513.57	7,528.07	7,513.57	79.71	213.79	-93.85	3,017.60	1,276.61	3,611.41	3,318.69	292.72	12.337		
10,700.00	7,520.58	7,535.07	7,520.58	81.98	214.06	-92.47	3,017.60	1,276.61	3,674.94	3,379.30	295.64	12.430		
10,800.00	7,524.92	7,539.41	7,524.92	84.26	214.22	-92.26	3,017.60	1,276.61	3,740.18	3,442.09	298.09	12.547		
10,900.00	7,528.99	7,543.48	7,528.99	86.55	214.37	-91.78	3,017.60	1,276.61	3,807.38	3,506.75	300.62	12.665		
11,000.00	7,531.40	7,545.89	7,531.40	88.83	214.46	-90.75	3,017.60	1,276.61	3,875.70	3,572.56	303.13	12.785		

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 376-INC-ONLY-Offset Well													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 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	Warning	
11 100 00	7,533.81	7,548.30	7,533.81	91.12	214.55	-92.15	3,017.60	1,276.61	3,944.88	3,639.51	305.37	12.918		
11 200 00	7,538.27	7,552.77	7,538.27	93.41	214.71	-92.83	3,017.60	1,276.61	4,014.91	3,707.23	307.68	13.049		
11 300 00	7,541.75	7,556.24	7,541.75	95.69	214.84	-91.15	3,017.60	1,276.61	4,086.20	3,775.80	310.40	13.164		
11 400 00	7,541.59	7,556.09	7,541.59	97.08	214.84	-88.72	3,017.60	1,276.61	4,158.62	3,845.82	312.70	13.299		
11 500 00	7,538.19	7,552.69	7,538.19	100.27	214.71	-87.32	3,017.60	1,276.61	4,231.77	3,917.15	314.62	13.450		
11 600 00	7,534.20	7,548.69	7,534.20	102.56	214.56	-86.16	3,017.60	1,276.61	4,305.80	3,986.66	316.94	13.586		
11 700 00	7,533.96	7,548.46	7,533.96	104.85	214.55	-91.75	3,017.60	1,276.61	4,381.12	4,061.94	319.18	13.726		
11 800 00	7,539.33	7,553.82	7,539.33	107.14	214.75	-94.79	3,017.60	1,276.61	4,458.06	4,137.36	320.70	13.901		
11 900 00	7,545.90	7,559.00	7,543.47	109.43	214.91	-94.47	3,017.60	1,276.61	4,536.50	4,213.25	323.25	14.034		
12 000 00	7,551.61	7,558.00	7,543.47	111.72	214.91	-94.38	3,017.60	1,276.61	4,615.73	4,290.12	325.61	14.176		
12 100 00	7,558.85	7,558.00	7,543.47	114.01	214.91	-96.45	3,017.60	1,276.61	4,695.02	4,368.13	328.89	14.363		
12 200 00	7,569.38	7,558.00	7,543.47	116.29	214.91	-87.47	3,017.60	1,276.61	4,773.85	4,445.35	328.50	14.532		
12 300 00	7,579.92	7,558.00	7,543.47	118.57	214.91	-97.29	3,017.60	1,276.61	4,853.17	4,522.27	330.90	14.667		



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Millman Unit - #21B - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 398-INC-ONLY-Offset Well													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Reference		Highside	Distance		Minimum		Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)			
0.00	0.00	0.00	85.60	0.00	0.00	81.19	545.60	3.520.84	3.563.46					
100.00	100.00	34.40	100.00	0.07	0.30	-65.20	545.60	3.520.84	3.562.88	3.562.31	0.36	9.834.278		
200.00	200.00	134.40	200.00	0.24	1.16	-80.87	545.60	3.520.84	3.562.43	3.561.03	1.40	2.542.426		
300.00	299.99	234.39	299.99	0.42	2.02	-54.69	545.60	3.520.84	3.562.00	3.559.56	2.44	1.459.603		
400.00	399.98	334.38	399.98	0.60	2.89	-71.60	545.60	3.520.84	3.561.41	3.557.93	3.48	1.023.540		
450.10	450.08	384.48	450.08	0.69	3.32	-80.00	545.60	3.520.84	3.561.30	3.557.30	4.00	890.324		
500.00	499.97	434.37	499.97	0.77	4.11	-103.42	545.60	3.520.84	3.561.41	3.556.54	4.87	730.735		
600.00	599.95	534.35	599.95	0.95	5.95	-92.24	545.60	3.520.84	3.561.88	3.554.79	6.89	517.005		
700.00	699.92	634.32	699.92	1.13	7.79	-88.54	545.60	3.520.84	3.561.70	3.552.79	8.91	399.965		
800.00	799.89	734.29	799.89	1.31	9.62	-85.53	545.60	3.520.84	3.561.58	3.550.66	10.92	326.131		
900.00	899.87	834.27	899.87	1.48	11.90	-88.63	545.60	3.520.84	3.561.47	3.548.09	13.37	266.319		
918.51	918.37	852.77	918.37	1.52	12.32	-90.00	545.60	3.520.84	3.561.46	3.547.63	13.83	257.519		
1,000.00	999.84	934.24	999.84	1.66	14.19	-95.95	545.60	3.520.84	3.561.56	3.545.72	15.84	224.820		
1,100.00	1,099.78	1,034.18	1,099.78	1.84	16.48	-96.09	545.60	3.520.84	3.561.92	3.543.61	18.31	184.515		
1,200.00	1,199.68	1,134.08	1,199.68	2.02	18.78	-90.50	545.60	3.520.84	3.562.17	3.541.38	20.78	171.395		
1,300.00	1,299.58	1,233.98	1,299.58	2.19	21.07	-85.81	545.60	3.520.84	3.562.01	3.538.76	23.25	153.172		
1,400.00	1,399.46	1,333.88	1,399.46	2.37	23.78	-89.58	545.60	3.520.84	3.561.82	3.535.67	26.15	136.192		
1,405.30	1,405.76	1,340.17	1,405.76	2.38	23.96	-90.00	545.60	3.520.84	3.561.82	3.535.48	26.34	133.225		
1,500.00	1,499.34	1,433.77	1,499.34	2.55	26.21	-95.60	545.60	3.520.84	3.562.06	3.533.30	28.76	123.868		
1,600.00	1,599.21	1,533.67	1,599.21	2.73	28.38	-88.54	545.60	3.520.84	3.562.25	3.531.14	31.11	114.489		
1,634.66	1,633.83	1,568.29	1,633.83	2.80	29.09	-90.48	545.60	3.520.84	3.562.24	3.530.36	31.88	111.725		
1,700.00	1,699.08	1,624.00	1,699.08	2.92	30.22	-93.77	545.60	3.520.84	3.562.38	3.529.24	33.14	107.487		
1,800.00	1,798.86	1,733.42	1,798.86	3.10	32.55	-96.22	545.60	3.520.84	3.562.80	3.527.15	35.65	89.939		
1,900.00	1,898.83	1,833.31	1,898.83	3.28	34.82	-92.87	545.60	3.520.84	3.563.18	3.525.08	38.10	93.514		
2,000.00	1,998.74	1,933.21	1,998.74	3.46	37.22	-84.33	545.60	3.520.84	3.563.14	3.522.46	40.68	87.555		
2,100.00	2,098.72	2,033.19	2,098.72	3.63	39.62	-29.41	545.60	3.520.84	3.562.41	3.519.17	43.24	82.378		
2,200.00	2,198.59	2,133.16	2,198.59	3.80	42.01	84.48	545.60	3.520.84	3.561.68	3.515.87	45.81	77.746		
2,266.18	2,264.81	2,199.26	2,264.81	3.91	43.60	90.00	545.60	3.520.84	3.561.56	3.514.05	47.51	74.969		
2,300.00	2,298.59	2,233.08	2,298.59	3.97	44.48	92.02	545.60	3.520.84	3.561.59	3.513.15	48.45	73.517		
2,400.00	2,398.43	2,332.84	2,398.43	4.14	47.18	92.17	545.60	3.520.84	3.561.80	3.510.48	51.31	69.414		
2,500.00	2,498.24	2,432.77	2,498.24	4.30	49.55	92.87	545.60	3.520.84	3.562.07	3.508.21	53.85	66.142		
2,600.00	2,598.05	2,532.58	2,598.05	4.47	51.67	87.73	545.60	3.520.84	3.562.10	3.505.96	56.15	63.444		
2,700.00	2,697.85	2,632.39	2,697.85	4.65	53.81	85.43	545.60	3.520.84	3.561.72	3.503.27	58.45	60.934		
2,757.60	2,755.33	2,688.87	2,755.33	4.75	55.08	90.00	545.60	3.520.84	3.561.57	3.501.74	59.83	59.531		
2,800.00	2,797.65	2,732.19	2,797.65	4.82	56.02	93.57	545.60	3.520.84	3.561.65	3.500.81	60.84	58.542		
2,900.00	2,897.44	2,831.98	2,897.44	4.99	58.24	96.07	545.60	3.520.84	3.562.20	3.499.98	63.23	56.341		
3,000.00	2,997.21	2,931.75	2,997.21	5.17	60.45	81.55	545.60	3.520.84	3.562.65	3.497.04	65.62	54.296		
3,100.00	3,097.00	3,031.56	3,097.00	5.34	62.65	85.42	545.60	3.520.84	3.562.50	3.494.51	67.99	52.336		
3,200.00	3,196.92	3,131.48	3,196.92	5.52	64.77	73.15	545.60	3.520.84	3.562.06	3.491.78	70.29	50.677		
3,265.08	3,262.00	3,196.56	3,262.00	5.63	66.16	90.00	545.60	3.520.84	3.561.94	3.490.16	71.79	49.619		
3,300.00	3,296.91	3,231.47	3,296.91	5.69	66.90	97.69	545.60	3.520.84	3.561.98	3.489.39	72.59	49.071		
3,400.00	3,396.90	3,331.49	3,396.90	5.86	68.90	94.26	545.60	3.520.84	3.562.11	3.487.35	74.77	47.644		
3,500.00	3,496.89	3,431.48	3,496.89	6.04	70.66	98.20	545.60	3.520.84	3.562.27	3.485.58	76.70	46.446		
3,600.00	3,596.88	3,531.46	3,596.88	6.21	72.42	86.31	545.60	3.520.84	3.562.13	3.483.50	78.63	45.303		
3,656.70	3,653.58	3,588.17	3,653.58	6.31	73.42	90.00	545.60	3.520.84	3.561.88	3.482.25	79.73	44.676		
3,700.00	3,696.88	3,631.47	3,696.88	6.38	74.19	115.70	545.60	3.520.84	3.562.07	3.481.50	80.57	44.210		
3,800.00	3,796.87	3,731.46	3,796.87	6.56	75.96	77.77	545.60	3.520.84	3.562.21	3.479.69	82.52	43.168		
3,820.48	3,817.33	3,751.92	3,817.33	6.59	76.33	80.00	545.60	3.520.84	3.562.20	3.479.28	82.92	42.960		
3,900.00	3,896.87	3,831.46	3,896.87	6.73	77.74	135.17	545.60	3.520.84	3.562.38	3.477.91	84.47	42.175		
4,000.00	3,996.87	3,931.46	3,996.87	6.90	79.51	-108.33	545.60	3.520.84	3.562.87	3.478.25	86.42	41.227		
4,100.00	4,096.87	4,031.46	4,096.87	7.08	81.29	93.67	545.60	3.520.84	3.562.75	3.474.39	88.36	40.319		
4,200.00	4,196.87	4,131.46	4,196.87	7.25	83.27	155.88	545.60	3.520.84	3.563.16	3.472.64	90.52	39.362		

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TVD Reference: GL + KB @ 3446 00usft (H&P 482)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Millman Unit - #218 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 398-INC-ONLY-Offset Well													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)	Between Centres (usft)	Between Ellipses (usft)				
4,300.00	4,296.87	4,231.46	4,296.87	7.43	85.40	-174.65	545.60	3,520.84	3,563.90	3,471.08	92.82	38.394		
4,400.00	4,396.86	4,331.46	4,396.86	7.60	87.53	-88.69	545.60	3,520.84	3,564.25	3,469.12	95.13	37.468		
4,443.08	4,439.94	4,374.53	4,439.94	7.67	88.45	-90.00	545.60	3,520.84	3,564.25	3,468.13	96.12	37.081		
4,500.00	4,496.86	4,431.45	4,496.86	7.77	89.65	-92.64	545.60	3,520.84	3,564.28	3,466.82	97.43	36.582		
4,600.00	4,596.86	4,531.47	4,596.86	7.95	91.84	-59.96	545.60	3,520.84	3,564.17	3,464.39	99.78	35.720		
4,628.53	4,625.39	4,559.99	4,625.39	8.00	92.47	-90.00	545.60	3,520.84	3,564.15	3,463.68	100.46	35.477		
4,700.00	4,696.86	4,631.46	4,696.86	8.12	94.05	-151.40	545.60	3,520.84	3,564.31	3,462.14	102.17	34.886		
4,800.00	4,796.86	4,731.46	4,796.86	8.29	96.27	-102.10	545.60	3,520.84	3,564.65	3,460.09	104.56	34.092		
4,900.00	4,896.86	4,831.48	4,896.86	8.47	98.40	-80.36	545.60	3,520.84	3,564.69	3,457.83	106.86	33.357		
4,924.15	4,921.00	4,855.63	4,921.00	8.51	98.89	-90.00	545.60	3,520.84	3,564.68	3,457.28	107.40	33.191		
5,000.00	4,996.85	4,931.48	4,996.85	8.64	100.44	-140.37	545.60	3,520.84	3,564.82	3,455.74	109.08	32.681		
5,100.00	5,096.85	5,031.48	5,096.85	8.82	102.48	-113.15	545.60	3,520.84	3,565.18	3,453.89	111.30	32.033		
5,200.00	5,196.85	5,131.48	5,196.85	8.99	104.52	-157.82	545.60	3,520.84	3,565.47	3,451.96	113.51	31.411		
5,300.00	5,296.85	5,231.48	5,296.85	9.17	106.56	-117.93	545.60	3,520.84	3,565.79	3,450.06	115.73	30.812		
5,400.00	5,396.84	5,331.50	5,396.84	9.34	108.51	-115.85	545.60	3,520.84	3,566.21	3,448.36	117.85	30.260		
5,500.00	5,496.84	5,431.49	5,496.84	9.51	110.38	-92.97	545.60	3,520.84	3,566.44	3,446.54	119.90	29.746		
5,600.00	5,596.83	5,531.48	5,596.83	9.69	112.25	-73.85	545.60	3,520.84	3,566.23	3,444.29	121.94	29.246		
5,700.00	5,696.82	5,631.47	5,696.82	9.86	114.13	-39.45	545.60	3,520.84	3,565.80	3,441.61	123.98	28.759		
5,800.00	5,796.82	5,731.48	5,796.82	10.04	116.34	-59.07	545.60	3,520.84	3,565.13	3,438.75	126.38	28.210		
5,900.00	5,896.82	5,831.48	5,896.82	10.21	118.64	-18.31	545.60	3,520.84	3,564.98	3,436.13	128.85	27.667		
6,000.00	5,996.82	5,931.48	5,996.82	10.38	120.94	-35.35	545.60	3,520.84	3,564.74	3,433.42	131.32	27.145		
6,028.79	6,025.61	5,960.27	6,025.61	10.43	121.60	-90.00	545.60	3,520.84	3,564.70	3,432.66	132.04	26.998		
6,100.00	6,096.82	6,031.48	6,096.82	10.56	123.24	-161.27	545.60	3,520.84	3,564.98	3,431.19	133.79	26.645		
6,200.00	6,196.81	6,131.48	6,196.81	10.73	125.54	-98.18	545.60	3,520.84	3,565.48	3,429.21	136.27	26.165		
6,300.00	6,296.80	6,231.47	6,296.80	10.91	127.84	-144.20	545.60	3,520.84	3,566.13	3,427.39	138.74	25.704		
6,400.00	6,396.79	6,331.46	6,396.79	11.08	130.23	-128.56	545.60	3,520.84	3,567.37	3,426.07	141.30	25.247		
6,500.00	6,496.77	6,431.44	6,496.77	11.25	132.88	-127.89	545.60	3,520.84	3,568.59	3,424.46	144.13	24.759		
6,600.00	6,596.75	6,531.42	6,596.75	11.34	135.54	-138.56	545.60	3,520.84	3,570.06	3,423.20	146.86	24.310		
6,700.00	6,696.72	6,631.45	6,696.72	11.39	138.18	-42.25	545.60	3,520.84	3,570.89	3,421.35	149.54	23.879		
6,800.00	6,796.36	6,731.09	6,796.36	11.41	140.75	-0.26	545.60	3,520.84	3,563.77	3,413.57	150.19	23.728		
6,900.00	6,892.58	6,827.32	6,892.58	11.46	143.23	-3.79	545.60	3,520.84	3,537.29	3,393.01	144.28	24.516		
7,000.00	6,983.42	6,918.15	6,983.42	11.53	145.57	-5.55	545.60	3,520.84	3,495.76	3,356.63	139.13	25.127		
7,100.00	7,068.57	7,003.30	7,068.57	11.67	147.76	-2.78	545.60	3,520.84	3,443.48	3,310.45	133.03	25.884		
7,200.00	7,147.09	7,081.87	7,147.09	11.86	149.91	7.95	545.60	3,520.84	3,381.82	3,261.69	120.13	26.151		
7,300.00	7,213.55	7,148.33	7,213.55	12.45	151.75	15.56	545.60	3,520.84	3,308.14	3,202.13	106.01	31.207		
7,400.00	7,265.52	7,200.30	7,265.52	13.21	153.19	10.55	545.60	3,520.84	3,223.64	3,145.07	78.57	41.030		
7,500.00	7,299.01	7,233.83	7,299.01	14.30	154.14	2.79	545.60	3,520.84	3,129.60	3,078.93	50.67	61.764		
7,600.00	7,318.69	7,253.50	7,318.69	15.65	154.71	-10.27	545.60	3,520.84	3,031.69	2,980.25	41.44	73.159		
7,700.00	7,323.61	7,258.42	7,323.61	17.22	154.85	29.24	545.60	3,520.84	2,931.85	2,844.84	87.00	33.698		
7,800.00	7,323.00	7,257.81	7,323.00	18.92	154.83	136.82	545.60	3,520.84	2,831.86	2,711.34	120.52	23.498		
7,900.00	7,320.73	7,255.54	7,320.73	20.72	154.77	179.18	545.60	3,520.84	2,731.89	2,710.13	21.76	125.570		
8,000.00	7,316.17	7,252.98	7,316.17	22.82	154.70	-124.24	545.60	3,520.84	2,631.93	2,484.55	147.39	17.857		
8,100.00	7,318.02	7,252.83	7,318.02	24.58	154.69	-77.83	545.60	3,520.84	2,532.11	2,356.84	175.28	14.447		
8,200.00	7,322.06	7,256.87	7,322.06	26.60	154.81	-66.98	545.60	3,520.84	2,432.83	2,265.60	167.23	14.548		
8,300.00	7,326.76	7,263.57	7,326.76	28.66	155.00	-66.49	545.60	3,520.84	2,334.23	2,165.58	168.65	13.841		
8,400.00	7,336.97	7,271.78	7,336.97	30.75	155.24	-64.93	545.60	3,520.84	2,236.28	2,067.54	168.75	13.252		
8,500.00	7,347.56	7,282.37	7,347.56	32.85	155.54	-63.73	545.60	3,520.84	2,138.98	1,969.65	169.33	12.632		
8,600.00	7,357.61	7,292.42	7,357.61	34.99	155.83	-67.96	545.60	3,520.84	2,041.86	1,864.63	177.04	11.533		
8,700.00	7,366.51	7,301.32	7,366.51	37.14	156.08	-69.35	545.60	3,520.84	1,944.95	1,763.95	181.00	10.746		
8,800.00	7,375.09	7,309.80	7,375.09	39.31	156.33	-69.92	545.60	3,520.84	1,847.77	1,663.76	184.01	10.042		
8,900.00	7,382.80	7,317.61	7,382.80	41.51	156.55	-72.45	545.60	3,520.84	1,750.50	1,561.46	189.05	9.260		
9,000.00	7,390.22	7,325.03	7,390.22	43.71	156.77	-70.26	545.60	3,520.84	1,653.30	1,464.25	189.06	8.745		

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Millman Unit - #218 - OH - Surveys													Offset Site Error: 0.00 usft
Survey Program: 398-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)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	7,398.81	7,333.62	7,398.81	45.92	157.01	-70.37	545.60	3,520.84	1,556.28	1,364.73	191.55	8.125	
9,200.00	7,407.78	7,342.59	7,407.78	48.14	157.27	-67.97	545.60	3,520.84	1,459.44	1,268.42	191.02	7.640	
9,300.00	7,417.16	7,351.97	7,417.16	50.36	157.54	-71.29	545.60	3,520.84	1,362.79	1,165.43	197.36	6.905	
9,400.00	7,424.63	7,359.44	7,424.63	52.60	157.75	-76.62	545.60	3,520.84	1,266.26	1,061.39	204.87	6.181	
9,500.00	7,430.92	7,365.73	7,430.92	54.84	157.94	-78.22	545.60	3,520.84	1,170.26	961.81	208.45	5.614	
9,600.00	7,437.64	7,372.45	7,437.64	57.08	158.13	-78.89	545.60	3,520.84	1,075.46	864.17	211.28	5.090	
9,700.00	7,443.77	7,378.58	7,443.77	59.33	158.30	-81.72	545.60	3,520.84	981.81	766.39	215.42	4.558	
9,800.00	7,449.69	7,384.50	7,449.69	61.59	158.47	-81.23	545.60	3,520.84	889.11	671.53	217.58	4.088	
9,900.00	7,457.20	7,392.01	7,457.20	63.85	158.69	-80.30	545.60	3,520.84	798.30	578.65	219.45	3.638	
10,000.00	7,466.07	7,400.88	7,466.07	66.10	158.95	-80.95	545.60	3,520.84	710.28	487.97	222.31	3.185	
10,100.00	7,475.14	7,409.95	7,475.14	68.36	159.21	-82.83	545.60	3,520.84	626.01	400.21	225.79	2.772	
10,200.00	7,483.36	7,418.17	7,483.36	70.62	159.44	-84.92	545.60	3,520.84	547.45	318.36	229.09	2.390	
10,300.00	7,490.86	7,425.67	7,490.86	72.89	159.66	-86.67	545.60	3,520.84	477.80	245.78	232.03	2.059	
10,400.00	7,497.41	7,432.22	7,497.41	75.16	159.86	-87.83	545.60	3,520.84	420.69	186.00	234.69	1.793	
10,500.00	7,504.81	7,439.62	7,504.81	77.43	160.06	-88.62	545.60	3,520.84	382.09	144.83	237.26	1.610	
10,600.00	7,513.57	7,448.38	7,513.57	79.71	160.31	-89.91	545.60	3,520.84	367.21	127.34	239.86	1.531	
10,606.69	7,514.12	7,448.93	7,514.12	79.86	160.33	-90.00	545.60	3,520.84	367.15	127.11	240.03	1.530 CC ES SF	
10,700.00	7,520.58	7,455.39	7,520.58	81.98	160.51	-90.74	545.60	3,520.84	378.63	136.29	242.34	1.562	
10,800.00	7,524.92	7,459.73	7,524.92	84.26	160.64	-91.35	545.60	3,520.84	414.58	169.91	244.67	1.694	
10,900.00	7,528.99	7,483.80	7,528.99	86.55	160.75	-91.55	545.60	3,520.84	489.90	222.84	247.06	1.902	
11,000.00	7,531.40	7,466.21	7,531.40	88.83	160.82	-90.84	545.60	3,520.84	537.97	288.47	249.50	2.156	
11,100.00	7,533.81	7,468.62	7,533.81	91.12	160.89	-92.92	545.60	3,520.84	614.41	362.80	251.61	2.442	
11,200.00	7,538.27	7,473.08	7,538.27	93.41	161.02	-94.46	545.60	3,520.84	696.46	442.86	253.61	2.746	
11,300.00	7,541.75	7,476.56	7,541.75	95.69	161.12	-92.05	545.60	3,520.84	782.71	526.14	256.56	3.051	
11,400.00	7,541.59	7,476.40	7,541.59	97.98	161.12	-87.48	545.60	3,520.84	871.82	612.99	258.82	3.368	
11,500.00	7,538.19	7,473.00	7,538.19	100.27	161.02	-84.25	545.60	3,520.84	962.92	702.89	260.04	3.703	
11,600.00	7,534.20	7,469.01	7,534.20	102.56	160.90	-85.78	545.60	3,520.84	1,055.46	792.69	262.77	4.017	
11,700.00	7,533.96	7,468.77	7,533.96	104.85	160.90	-94.35	545.60	3,520.84	1,149.40	884.47	264.93	4.338	
11,800.00	7,539.33	7,474.14	7,539.33	107.14	161.05	-102.71	545.60	3,520.84	1,244.50	982.65	261.88	4.753	
11,900.00	7,545.90	7,480.71	7,545.90	109.43	161.24	-102.74	545.60	3,520.84	1,340.52	1,076.31	264.22	5.074	
12,000.00	7,551.61	7,486.42	7,551.61	111.72	161.40	-103.22	545.60	3,520.84	1,437.07	1,170.91	266.17	5.399	
12,100.00	7,558.85	7,493.66	7,558.85	114.01	161.61	-109.46	545.60	3,520.84	1,533.69	1,272.94	260.75	5.882	
12,200.00	7,569.38	7,504.20	7,569.38	116.29	161.81	-112.96	545.60	3,520.84	1,629.99	1,372.53	257.46	6.331	
12,300.00	7,579.92	7,514.74	7,579.92	118.57	162.22	-113.68	545.60	3,520.84	1,726.54	1,468.00	258.54	6.678	

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3445.00usft (H&P 482)
MD Reference: GL + KB @ 3445.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #1H - WB1/Job #1411057 - Surveys (Pioneer 28)													Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRO-MS. 6810-PHX+MWD+BGGM													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	31.60	-1.40	0.00	0.03	19.85	1.796.03	651.94	1.910.69				
100.00	100.00	127.19	94.19	0.07	0.17	-126.44	1.796.27	651.79	1.911.14	1.910.90	0.24	8,049.680	
200.00	200.00	223.21	190.21	0.24	0.43	-142.14	1.796.83	651.44	1.912.11	1.911.44	0.67	2,861.782	
300.00	299.99	322.08	289.07	0.42	0.69	-115.99	1.797.53	651.09	1.913.23	1.912.12	1.11	1,731.027	
400.00	399.98	421.17	388.16	0.60	0.94	-132.82	1.798.21	650.92	1.914.56	1.913.03	1.54	1,246.903	
500.00	499.97	519.41	486.40	0.77	1.17	-164.74	1.798.85	651.10	1.916.61	1.914.66	1.95	985.252	
600.00	599.95	619.63	586.62	0.95	1.41	-153.64	1.799.50	651.35	1.918.32	1.916.96	2.36	813.086	
700.00	699.92	719.66	686.64	1.13	1.66	-149.84	1.800.15	651.58	1.922.10	1.919.31	2.79	689.630	
800.00	799.89	817.67	784.65	1.31	1.91	-146.82	1.800.81	651.84	1.924.72	1.921.52	3.21	599.747	
900.00	899.87	911.59	878.57	1.48	2.13	-149.91	1.801.57	652.36	1.927.63	1.924.02	3.61	533.601	
1,000.00	999.84	1,006.16	973.13	1.66	2.35	-157.21	1.802.45	653.42	1.931.01	1.927.01	4.00	482.522	
1,100.00	1,099.78	1,103.12	1,070.07	1.84	2.56	-157.28	1.803.40	654.96	1.935.59	1.931.20	4.39	441.104	
1,200.00	1,199.68	1,203.44	1,170.37	2.02	2.78	-151.83	1.804.41	656.67	1.941.08	1.936.29	4.79	405.271	
1,300.00	1,299.58	1,306.73	1,273.64	2.19	3.02	-146.89	1.805.43	658.19	1.946.46	1.941.25	5.21	373.621	
1,400.00	1,399.48	1,410.99	1,377.90	2.37	3.27	-150.64	1.806.30	659.50	1.951.71	1.946.07	5.64	346.255	
1,500.00	1,499.34	1,511.40	1,478.30	2.55	3.51	-156.62	1.807.03	660.77	1.957.29	1.951.23	6.05	323.362	
1,600.00	1,599.21	1,618.94	1,585.83	2.73	3.77	-149.52	1.807.63	661.83	1.962.83	1.956.14	6.49	302.269	
1,700.00	1,699.08	1,720.01	1,688.89	2.92	4.02	-154.74	1.808.07	662.53	1.967.78	1.960.84	6.92	284.394	
1,800.00	1,798.96	1,818.51	1,785.39	3.10	4.27	-157.15	1.808.52	663.22	1.972.99	1.965.85	7.34	268.619	
1,900.00	1,898.83	1,920.07	1,886.94	3.28	4.52	-153.76	1.808.94	663.98	1.978.13	1.970.36	7.77	254.427	
2,000.00	1,998.74	2,019.18	1,986.06	3.46	4.77	-145.20	1.809.36	664.62	1.982.55	1.974.34	8.21	241.535	
2,100.00	2,098.72	2,118.80	2,085.66	3.63	5.03	-31.49	1,809.87	665.19	1.984.12	1.975.48	8.64	229.636	
2,200.00	2,198.69	2,224.52	2,191.39	3.80	5.30	23.57	1,810.25	665.78	1.982.39	1.973.33	9.07	218.668	
2,300.00	2,298.59	2,328.50	2,295.37	3.97	5.53	31.15	1,810.31	666.27	1.978.67	1.969.21	9.48	209.097	
2,400.00	2,398.43	2,428.27	2,393.13	4.14	5.75	31.31	1,810.40	666.74	1.974.15	1.964.30	9.85	200.457	
2,500.00	2,498.24	2,528.47	2,495.33	4.30	5.98	32.03	1,810.45	667.25	1.969.19	1.958.92	10.25	192.197	
2,600.00	2,598.05	2,630.63	2,597.49	4.47	6.20	26.87	1,810.38	667.63	1.963.60	1.953.17	10.63	184.759	
2,700.00	2,697.85	2,728.23	2,695.09	4.65	6.42	24.55	1,810.41	667.78	1.958.16	1.947.14	11.02	177.847	
2,800.00	2,797.65	2,828.08	2,792.94	4.82	6.67	32.89	1,810.60	667.85	1.952.80	1.941.35	11.45	170.604	
2,900.00	2,897.44	2,925.72	2,892.58	4.99	6.93	35.22	1,810.60	668.00	1.947.67	1.935.79	11.87	164.062	
3,000.00	2,997.21	3,023.91	2,990.77	5.17	7.19	30.68	1,811.03	668.16	1.942.27	1.929.97	12.30	157.941	
3,100.00	3,097.00	3,121.19	3,088.05	5.34	7.42	24.51	1,811.42	668.27	1.936.97	1.924.25	12.71	152.348	
3,200.00	3,196.92	3,222.69	3,189.64	5.52	7.67	12.19	1,811.86	668.39	1.933.96	1.920.81	13.15	147.028	
3,300.00	3,296.91	3,327.96	3,294.82	5.69	7.91	36.74	1,812.10	668.43	1.932.95	1.919.39	13.56	142.508	
3,400.00	3,396.90	3,430.05	3,396.91	5.86	8.05	33.28	1,812.28	668.10	1.932.01	1.918.13	13.88	139.189	
3,500.00	3,496.89	3,532.52	3,499.38	6.04	8.13	37.21	1,812.43	667.50	1.930.86	1.916.73	14.13	136.834	
3,600.00	3,596.88	3,632.59	3,599.45	6.21	8.21	7.29	1,812.54	668.66	1.929.27	1.914.89	14.38	134.171	
3,700.00	3,696.88	3,730.04	3,696.88	6.38	8.30	54.64	1,812.91	668.63	1.928.27	1.913.62	14.64	131.687	
3,800.00	3,796.87	3,833.73	3,800.57	6.56	8.40	16.68	1,813.24	664.39	1.927.62	1.912.70	14.92	129.202	
3,900.00	3,896.87	3,933.67	3,900.50	6.73	8.49	74.05	1,813.44	663.24	1.927.06	1.911.87	15.19	126.871	
3,947.43	3,944.30	3,979.92	3,948.75	6.81	8.54	115.32	1,813.52	662.82	1.926.98	1.911.66	15.32	125.799	
4,000.00	3,996.87	4,031.84	3,998.67	6.90	8.60	-167.47	1,813.60	662.44	1.927.08	1.911.81	15.47	124.607	
4,100.00	4,096.87	4,129.73	4,096.55	7.08	8.71	32.51	1,813.79	661.72	1.927.02	1.911.26	15.76	122.280	
4,152.49	4,149.36	4,179.22	4,146.04	7.17	8.78	73.43	1,813.98	661.35	1.926.91	1.910.98	15.92	121.032	
4,200.00	4,196.87	4,225.95	4,192.77	7.25	8.86	94.71	1,814.22	660.97	1.926.98	1.910.91	16.07	119.883	
4,300.00	4,296.87	4,327.03	4,293.84	7.43	9.01	124.15	1,814.81	659.86	1.927.39	1.910.98	16.41	117.469	
4,400.00	4,396.88	4,425.88	4,392.68	7.60	9.17	-149.92	1,815.52	658.44	1.928.04	1.911.30	16.74	115.188	
4,500.00	4,496.86	4,522.70	4,489.49	7.77	9.33	-153.91	1,816.33	656.95	1.928.74	1.911.67	17.06	112.953	
4,600.00	4,596.86	4,614.54	4,581.30	7.95	9.50	-121.29	1,817.44	655.58	1.929.84	1.912.22	17.42	110.769	
4,700.00	4,696.86	4,713.77	4,680.51	8.12	9.70	147.22	1,818.94	653.91	1.930.80	1.913.01	17.79	108.529	
4,800.00	4,796.86	4,817.57	4,784.28	8.29	9.90	-163.54	1,820.43	651.97	1.932.22	1.914.05	18.17	106.361	
4,900.00	4,896.86	4,916.45	4,883.14	8.47	10.10	-141.86	1,821.80	650.22	1.933.68	1.915.15	18.54	104.318	

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 8810-PHX+MWD+BGGM													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		
5,000.00	4,996.85	5,021.66	4,988.33	8.64	10.30	158.07	1,823.05	648.53	1,934.78	1,915.84	18.92	102.260		
5,100.00	5,096.85	5,124.41	5,091.06	8.82	10.51	-174.74	1,823.88	647.25	1,935.78	1,916.48	19.30	100.322		
5,200.00	5,196.85	5,221.34	5,187.99	8.99	10.70	96.19	1,824.64	646.15	1,936.62	1,916.95	19.67	98.467		
5,300.00	5,296.85	5,316.66	5,283.29	9.17	10.90	56.28	1,825.60	645.02	1,936.93	1,916.88	20.04	96.631		
5,400.00	5,396.84	5,407.23	5,373.85	9.34	11.11	54.15	1,826.98	643.72	1,937.34	1,916.92	20.42	94.877		
5,500.00	5,496.84	5,501.88	5,469.47	9.51	11.32	31.21	1,828.90	642.07	1,938.00	1,917.19	20.81	93.130		
5,600.00	5,596.83	5,605.24	5,571.77	9.69	11.56	12.00	1,831.17	639.90	1,938.15	1,916.93	21.22	91.350		
5,644.83	5,641.65	5,649.17	5,615.68	9.77	11.65	0.74	1,832.14	638.88	1,938.07	1,916.67	21.39	90.589		
5,700.00	5,696.82	5,703.60	5,670.08	9.85	11.78	-22.50	1,833.39	637.56	1,938.19	1,916.58	21.61	89.678		
5,800.00	5,796.82	5,813.28	5,779.70	10.04	12.02	-3.00	1,835.69	634.77	1,938.72	1,916.69	22.03	88.010		
5,900.00	5,896.82	5,926.03	5,892.40	10.21	12.25	-43.86	1,837.38	631.84	1,939.08	1,916.65	22.44	86.426		
6,000.00	5,996.82	6,030.61	5,996.94	10.38	12.46	-26.91	1,838.29	629.06	1,938.80	1,915.88	22.82	84.967		
6,022.30	6,019.12	6,050.09	6,016.41	10.42	12.50	-4.02	1,838.46	628.64	1,938.76	1,915.86	22.90	84.873		
6,100.00	6,096.82	6,120.08	6,086.40	10.56	12.65	136.42	1,839.12	627.53	1,939.24	1,916.06	23.18	83.663		
6,200.00	6,196.81	6,224.06	6,190.35	10.73	12.88	-160.62	1,840.22	626.14	1,940.75	1,917.17	23.58	82.301		
6,300.00	6,296.80	6,344.10	6,310.38	10.91	13.11	153.41	1,840.59	623.80	1,941.62	1,917.64	23.98	80.856		
6,400.00	6,396.79	6,444.73	6,410.96	11.08	13.28	158.89	1,840.78	620.96	1,942.57	1,918.23	24.33	79.840		
6,500.00	6,496.77	6,543.61	6,509.78	11.25	13.47	169.60	1,841.21	617.55	1,943.83	1,919.13	24.69	78.725		
6,600.00	6,596.75	6,644.20	6,610.29	11.34	13.66	158.85	1,841.82	613.57	1,945.16	1,920.19	24.97	77.901		
6,700.00	6,696.72	6,745.75	6,711.74	11.39	13.86	-104.93	1,842.63	609.20	1,946.37	1,921.15	25.22	77.189		
6,800.00	6,796.36	6,838.16	6,804.07	11.41	13.97	-63.58	1,843.15	605.25	1,943.62	1,918.31	25.31	76.789		
6,900.00	6,892.58	6,915.25	6,882.14	11.46	13.98	-68.56	1,843.54	604.24	1,931.90	1,906.67	25.23	75.559		
7,000.00	6,983.42	6,987.69	6,953.51	11.53	13.99	-71.46	1,843.36	607.24	1,918.18	1,892.90	25.28	75.675		
7,100.00	7,068.57	7,040.44	7,006.01	11.67	14.00	-70.70	1,843.16	612.36	1,900.61	1,875.27	25.34	75.000		
7,200.00	7,147.09	7,075.27	7,040.44	11.96	14.01	-66.42	1,843.40	617.51	1,878.01	1,852.78	25.23	74.435		
7,300.00	7,213.55	7,093.00	7,057.82	12.45	14.02	-67.12	1,843.75	621.00	1,845.31	1,819.83	25.48	72.422		
7,400.00	7,265.52	7,124.00	7,087.76	13.21	14.04	-74.76	1,844.83	626.94	1,812.09	1,785.43	26.66	67.978		
7,500.00	7,299.01	7,156.00	7,117.76	14.30	14.06	-79.81	1,846.52	639.91	1,789.84	1,757.78	28.06	63.648		
7,600.00	7,318.69	7,181.73	7,141.02	15.65	14.13	-82.94	1,848.00	650.78	1,764.01	1,734.39	29.62	59.562		
7,700.00	7,323.61	7,270.39	7,215.25	17.22	14.68	-86.31	1,851.28	698.91	1,744.96	1,713.14	31.83	54.630		
7,800.00	7,323.00	7,486.80	7,348.43	18.92	20.57	-91.11	1,841.91	867.06	1,721.21	1,661.93	39.29	43.813		
7,900.00	7,320.73	7,581.68	7,387.68	20.72	25.44	-92.68	1,833.93	953.00	1,697.80	1,652.02	45.78	37.085		
8,000.00	7,318.17	7,688.67	7,414.30	22.62	32.18	-93.58	1,824.32	1,056.04	1,676.48	1,622.22	54.26	30.897		
8,100.00	7,318.02	7,791.01	7,424.88	24.58	39.35	-93.58	1,815.41	1,157.38	1,659.25	1,595.82	63.42	26.162		
8,200.00	7,322.06	7,897.16	7,431.54	26.60	47.06	-93.47	1,805.73	1,262.88	1,646.15	1,572.99	73.16	22.500		
8,300.00	7,328.76	7,989.81	7,435.93	28.66	53.93	-93.43	1,797.30	1,355.04	1,636.45	1,554.37	82.08	19.938		
8,400.00	7,336.97	8,073.23	7,438.01	30.75	60.18	-93.29	1,790.51	1,438.15	1,630.02	1,539.60	90.41	18.028		
8,500.00	7,347.56	8,137.00	7,436.07	32.85	64.99	-92.99	1,786.13	1,501.73	1,625.93	1,526.58	97.35	16.701		
8,600.00	7,357.81	8,209.85	7,432.39	34.99	70.51	-92.64	1,782.60	1,574.40	1,624.00	1,518.95	105.05	15.460		
8,603.91	7,357.97	8,212.20	7,432.30	35.07	70.69	-92.63	1,782.52	1,576.75	1,623.99	1,518.88	105.31	15.421		
8,700.00	7,366.51	8,276.08	7,430.06	37.14	75.56	-92.29	1,781.04	1,640.57	1,624.85	1,512.55	112.30	14.468		
8,800.00	7,375.09	8,346.97	7,428.32	39.31	80.99	-91.92	1,780.64	1,711.44	1,625.45	1,505.51	119.94	13.552		
8,900.00	7,382.80	8,420.00	7,427.60	41.51	86.59	-91.65	1,781.37	1,784.46	1,626.50	1,498.75	127.75	12.731		
9,000.00	7,390.22	8,486.64	7,427.81	43.71	91.71	-91.45	1,783.23	1,851.07	1,628.57	1,493.49	135.08	12.056		
9,100.00	7,398.81	8,572.04	7,428.86	45.92	98.28	-91.19	1,787.13	1,936.37	1,631.37	1,487.49	143.88	11.338		
9,200.00	7,407.78	8,671.67	7,430.44	48.14	105.96	-90.89	1,791.83	2,035.88	1,633.60	1,479.83	153.77	10.624		
9,300.00	7,417.16	8,785.52	7,432.18	50.36	113.21	-90.60	1,796.36	2,129.60	1,635.01	1,471.77	163.24	10.016		
9,400.00	7,424.63	8,864.59	7,434.62	52.60	120.87	-90.38	1,801.47	2,228.51	1,636.15	1,463.04	173.11	9.451		
9,500.00	7,430.92	9,002.35	7,439.62	54.84	131.54	-90.30	1,807.45	2,366.05	1,636.86	1,450.74	186.14	8.794		
9,600.00	7,437.64	9,190.52	7,448.21	57.08	146.64	-90.19	1,805.79	2,559.98	1,633.09	1,429.54	203.54	8.023		
9,700.00	7,443.77	9,296.85	7,450.01	59.33	154.45	-90.06	1,802.54	2,680.25	1,628.18	1,414.59	213.59	7.623		
9,800.00	7,449.69	9,376.40	7,451.19	61.59	160.66	-89.88	1,800.69	2,739.77	1,623.23	1,401.23	222.00	7.312		

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



Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Corn - #1H - WB1/Job #1411057 - Surveys (Pioneer 28)														Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS. 6610-PHX+MWD+BGGM														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	7,457.20	9,455.00	7,452.83	63.85	166.79	-89.72	1,799.66	2,818.34	1,519.53	1,389.11	230.42	7.028			
10,000.00	7,466.07	9,549.00	7,455.53	66.10	174.12	-89.54	1,799.49	2,912.30	1,517.53	1,377.50	240.03	8.739			
10,075.10	7,472.91	9,606.61	7,457.44	67.82	178.61	-89.45	1,799.95	2,969.88	1,517.05	1,370.79	248.26	9.566			
10,100.00	7,475.14	9,627.35	7,458.13	68.36	180.23	-89.41	1,800.19	2,990.61	1,517.01	1,368.59	248.42	6,509 CC			
10,200.00	7,483.36	9,712.43	7,461.04	70.62	186.86	-89.32	1,801.63	3,075.62	1,518.28	1,360.95	257.33	6.289			
10,300.00	7,480.66	9,800.42	7,464.44	72.89	193.72	-89.22	1,803.89	3,163.52	1,521.73	1,355.28	266.44	6.087			
10,400.00	7,497.41	9,896.77	7,468.85	75.16	201.23	-89.17	1,806.88	3,259.72	1,525.99	1,348.79	276.21	5.887			
10,500.00	7,504.81	10,015.17	7,473.79	77.43	210.46	-89.09	1,810.07	3,377.97	1,530.46	1,342.76	287.69	5.667			
10,600.00	7,513.57	10,105.52	7,476.67	79.71	217.51	-88.90	1,812.08	3,468.25	1,534.41	1,337.39	297.02	5.503			
10,700.00	7,520.58	10,202.09	7,480.47	81.98	225.05	-88.71	1,814.67	3,564.71	1,538.50	1,331.67	306.83	5.340			
10,800.00	7,524.92	10,299.36	7,485.19	84.26	232.64	-88.74	1,817.46	3,661.83	1,542.74	1,326.09	316.66	5.188			
10,900.00	7,528.99	10,393.96	7,490.52	86.55	240.01	-88.76	1,820.41	3,756.23	1,547.83	1,321.50	326.33	5.050			
11,000.00	7,531.40	10,520.25	7,496.21	88.83	248.65	-88.87	1,823.40	3,882.25	1,551.64	1,313.14	338.50	4.879			
11,100.00	7,533.81	10,614.36	7,503.84	91.12	257.19	-89.01	1,824.99	3,976.19	1,554.13	1,305.95	348.16	4.751			
11,200.00	7,536.27	10,693.99	7,508.90	93.41	263.40	-89.08	1,827.13	4,055.62	1,557.07	1,300.39	356.68	4.646			
11,300.00	7,541.75	10,782.87	7,516.34	95.89	270.30	-89.17	1,830.48	4,144.12	1,561.04	1,295.15	365.89	4.540			
11,400.00	7,541.59	10,877.98	7,535.28	97.98	285.44	-89.81	1,833.13	4,338.26	1,562.55	1,279.19	383.38	4.337			
11,500.00	7,538.19	11,102.66	7,546.56	100.27	295.13	-90.38	1,829.39	4,462.37	1,559.22	1,263.90	395.32	4.197			
11,600.00	7,534.20	11,203.98	7,554.77	102.56	303.00	-90.78	1,828.18	4,563.30	1,555.49	1,250.04	405.45	4.083			
11,700.00	7,533.96	11,311.97	7,564.49	104.85	311.39	-91.01	1,822.08	4,670.78	1,551.50	1,235.40	418.10	3.959			
11,800.00	7,539.33	11,418.92	7,571.35	107.14	319.72	-91.00	1,817.69	4,777.40	1,548.27	1,221.60	426.67	3.853			
11,900.00	7,545.90	11,519.90	7,574.92	109.43	327.61	-90.93	1,813.29	4,878.23	1,545.79	1,208.98	436.81	3.768			
12,000.00	7,551.61	11,603.48	7,577.89	111.72	334.14	-90.85	1,810.03	4,961.59	1,543.65	1,197.95	445.70	3.688			
12,100.00	7,558.85	11,702.07	7,581.58	114.01	341.84	-90.61	1,806.65	5,060.16	1,541.08	1,185.33	455.75	3.601			
12,200.00	7,569.38	11,792.57	7,584.86	116.29	348.92	-90.29	1,804.08	5,150.55	1,538.95	1,171.88	465.07	3.520			
12,300.00	7,579.92	11,874.00	7,587.57	118.57	355.29	-90.08	1,801.64	5,231.92	1,532.87	1,159.15	473.72	3,447 ES SF			



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Corn - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)													Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRO-MS, 8876-PHX-MWD-BGGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	(usft)	(usft)	(°)	+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	(usft)		
0.00	0.00	30.06	0.06	0.00	0.03	8.82	4,334.77	657.11	4,384.29				
100.00	100.00	131.54	101.54	0.07	0.16	-137.78	4,334.74	657.22	4,384.60	4,384.36	0.22	N/A	
200.00	200.00	235.64	205.64	0.24	0.35	-153.43	4,334.66	657.16	4,385.17	4,384.58	0.59	7,432.666	
300.00	299.99	348.29	318.29	0.42	0.58	-127.25	4,334.48	656.65	4,385.67	4,384.68	1.00	4,406.992	
400.00	399.98	430.90	400.89	0.60	0.74	-144.16	4,334.21	655.87	4,386.20	4,384.96	1.34	3,283.617	
500.00	499.97	500.00	469.99	0.77	0.84	-175.97	4,334.64	656.24	4,386.27	4,386.65	1.62	2,714.571	
600.00	599.95	560.34	530.32	0.95	0.91	-164.73	4,335.42	657.15	4,391.75	4,389.89	1.85	2,362.085	
700.00	699.92	661.32	631.28	1.13	1.05	-160.98	4,336.86	658.66	4,395.66	4,393.48	2.18	2,018.072	
800.00	799.89	762.10	732.04	1.31	1.23	-157.93	4,338.23	659.79	4,399.26	4,396.73	2.54	1,733.586	
900.00	899.87	867.29	837.22	1.48	1.45	-161.01	4,339.82	660.04	4,402.94	4,400.01	2.93	1,501.925	
1000.00	999.84	987.60	957.52	1.66	1.72	-168.31	4,341.27	660.23	4,406.46	4,403.08	3.38	1,304.577	
1100.00	1,099.78	1,085.28	1,055.21	1.84	1.95	-168.40	4,342.19	660.35	4,410.72	4,406.94	3.78	1,165.449	
1200.00	1,199.68	1,228.69	1,198.60	2.02	2.24	-182.74	4,342.75	660.88	4,415.39	4,411.14	4.25	1,039.870	
1300.00	1,299.58	1,328.98	1,298.89	2.19	2.40	-157.99	4,342.93	660.55	4,419.85	4,415.27	4.58	964.242	
1400.00	1,399.46	1,444.33	1,414.24	2.37	2.56	-161.72	4,342.54	660.65	4,423.95	4,419.03	4.93	898.261	
1500.00	1,499.34	1,526.66	1,496.57	2.55	2.69	-167.67	4,342.36	660.98	4,426.60	4,423.37	5.23	846.108	
1600.00	1,599.21	1,606.12	1,576.03	2.73	2.85	-160.53	4,342.60	661.04	4,433.75	4,428.18	5.57	796.323	
1700.00	1,699.08	1,701.47	1,671.38	2.92	3.05	-165.72	4,343.19	660.83	4,439.20	4,433.25	5.95	748.676	
1800.00	1,798.96	1,848.70	1,818.61	3.10	3.26	-168.11	4,342.89	660.86	4,443.72	4,437.38	6.34	700.752	
1900.00	1,898.83	1,932.82	1,902.72	3.28	3.37	-164.69	4,342.69	660.74	4,448.29	4,441.68	6.63	671.104	
2000.00	1,998.74	2,021.60	1,991.50	3.46	3.52	-158.09	4,342.79	660.43	4,452.48	4,445.53	6.95	640.498	
2100.00	2,098.72	2,116.52	2,086.42	3.63	3.70	-42.36	4,342.99	660.55	4,453.84	4,446.53	7.31	609.492	
2200.00	2,198.69	2,215.86	2,185.76	3.80	3.91	12.68	4,343.28	660.65	4,451.86	4,444.18	7.68	579.982	
2300.00	2,298.59	2,325.33	2,295.23	3.97	4.13	20.19	4,343.46	660.55	4,447.76	4,439.69	8.06	551.656	
2400.00	2,398.43	2,431.09	2,400.99	4.14	4.33	29.28	4,343.55	660.38	4,442.60	4,434.17	8.42	527.391	
2500.00	2,498.24	2,542.19	2,512.09	4.30	4.49	20.91	4,343.28	660.24	4,436.59	4,427.84	8.75	507.045	
2600.00	2,598.05	2,633.82	2,603.72	4.47	4.61	15.68	4,343.05	660.31	4,430.45	4,421.41	9.04	489.853	
2700.00	2,697.85	2,723.49	2,693.39	4.65	4.77	13.29	4,343.08	660.26	4,424.31	4,414.95	9.36	472.446	
2800.00	2,797.65	2,819.92	2,789.82	4.82	4.95	21.38	4,343.19	660.41	4,418.42	4,408.70	9.72	454.450	
2900.00	2,897.44	2,926.34	2,896.24	4.99	5.14	23.83	4,343.26	660.67	4,412.54	4,402.47	10.08	437.884	
3000.00	2,997.21	3,026.76	2,996.66	5.17	5.30	19.21	4,343.23	660.71	4,406.23	4,395.83	10.41	423.407	
3100.00	3,097.00	3,118.49	3,088.39	5.34	5.46	12.98	4,343.34	660.80	4,400.17	4,389.43	10.74	409.702	
3200.00	3,196.92	3,233.91	3,203.81	5.52	5.67	0.63	4,343.53	660.37	4,396.62	4,385.47	11.14	394.571	
3300.00	3,296.91	3,362.46	3,332.36	5.69	5.87	25.16	4,342.92	659.43	4,394.69	4,383.17	11.52	381.504	
3400.00	3,396.90	3,439.47	3,409.38	5.86	6.00	21.69	4,342.48	658.68	4,392.90	4,381.08	11.82	371.588	
3500.00	3,496.89	3,500.00	3,469.89	6.04	6.11	25.61	4,342.68	658.11	4,391.85	4,379.75	12.10	362.831	
3600.00	3,596.88	3,672.41	3,642.28	6.21	6.42	-4.32	4,342.10	658.13	4,389.62	4,377.03	12.59	348.712	
3700.00	3,696.88	3,783.20	3,753.06	6.38	6.58	43.04	4,341.39	654.86	4,387.58	4,374.66	12.93	339.453	
3800.00	3,796.87	3,873.27	3,843.11	6.56	6.79	5.08	4,340.78	652.94	4,386.15	4,372.84	13.31	329.630	
3900.00	3,896.87	3,978.07	3,947.89	6.73	6.99	62.46	4,339.82	651.00	4,384.57	4,370.89	13.66	320.476	
4000.00	3,996.87	4,072.94	4,042.74	6.90	7.18	-179.07	4,339.02	649.14	4,383.54	4,369.50	14.04	312.154	
4100.00	4,096.87	4,163.28	4,133.06	7.08	7.36	20.91	4,338.41	647.43	4,382.59	4,368.19	14.40	304.328	
4200.00	4,196.87	4,248.10	4,217.87	7.25	7.54	83.12	4,338.04	646.07	4,381.62	4,366.87	14.75	297.003	
4300.00	4,296.87	4,354.92	4,324.68	7.43	7.75	112.56	4,337.86	644.47	4,381.33	4,366.19	15.14	289.353	
4395.85	4,392.72	4,447.82	4,417.57	7.59	7.91	-164.35	4,337.14	644.33	4,380.98	4,365.52	15.46	283.334	
4400.00	4,396.86	4,450.83	4,420.58	7.60	7.91	-161.47	4,337.12	644.34	4,380.98	4,365.51	15.47	283.124	
4500.00	4,496.86	4,528.35	4,496.09	7.77	8.02	-165.40	4,336.83	645.05	4,381.22	4,365.47	15.75	278.108	
4600.00	4,596.86	4,642.39	4,612.13	7.95	8.17	-132.70	4,336.68	646.29	4,381.60	4,365.51	16.09	272.397	
4700.00	4,696.86	4,769.89	4,739.62	8.12	8.39	135.87	4,335.57	645.97	4,380.95	4,364.48	16.47	265.952	
4780.80	4,777.66	4,846.18	4,815.89	8.26	8.52	-179.83	4,334.85	646.05	4,380.71	4,363.96	16.75	261.573	
4800.00	4,796.86	4,864.49	4,834.22	8.29	8.55	-174.82	4,334.69	646.02	4,380.72	4,363.91	16.81	260.549	
4900.00	4,896.86	4,938.37	4,909.09	8.47	8.69	-153.08	4,334.23	645.66	4,380.88	4,363.75	17.13	255.741	

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)														Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 6876-PHX+MWD+BGGM														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)	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	Warning	
5,000.00	4,996.85	5,009.84	4,979.56	8.64	8.83	146.91		4,334.44	646.10	4,381.55	4,364.11	17.45	251.148		
5,100.00	5,096.85	5,144.48	5,114.20	8.82	9.11	174.13		4,334.05	643.89	4,381.84	4,363.74	17.90	244.839		
5,200.00	5,196.85	5,211.73	5,181.44	8.99	9.25	85.10		4,334.15	643.38	4,382.10	4,363.89	18.21	240.637		
5,300.00	5,296.85	5,300.00	5,269.71	9.17	9.43	45.20		4,334.64	642.61	4,382.19	4,363.63	18.57	236.002		
5,334.59	5,331.44	5,332.62	5,302.33	9.23	9.50	44.46		4,334.89	642.27	4,382.17	4,363.47	18.70	234.387		
5,400.00	5,396.84	5,386.43	5,356.13	9.34	9.61	43.10		4,335.40	641.71	4,382.25	4,363.33	18.92	231.600		
5,500.00	5,496.84	5,471.95	5,441.63	9.51	9.79	20.20		4,336.51	640.64	4,382.57	4,363.30	19.27	227.400		
5,600.00	5,596.83	5,563.10	5,532.78	9.69	9.98	1.04		4,338.01	639.13	4,382.87	4,363.03	19.64	223.201		
5,623.54	5,620.37	5,595.12	5,554.78	9.73	10.03	-4.21		4,338.40	638.74	4,382.84	4,362.92	19.72	222.204		
5,700.00	5,696.82	5,670.16	5,639.78	9.86	10.21	-33.41		4,339.86	637.12	4,382.84	4,362.80	20.04	218.698		
5,800.00	5,796.82	5,787.18	5,756.77	10.04	10.47	-13.84		4,341.55	634.59	4,383.38	4,362.91	20.47	214.108		
5,900.00	5,896.82	5,892.85	5,862.40	10.21	10.70	-54.64		4,342.82	632.02	4,384.04	4,363.15	20.88	209.914		
6,000.00	5,996.82	5,988.88	5,958.37	10.38	10.92	-37.64		4,343.97	629.58	4,384.66	4,363.38	21.28	206.070		
6,100.00	6,096.82	6,121.00	6,090.48	10.56	11.23	125.70		4,345.21	626.07	4,385.31	4,363.55	21.76	201.571		
6,200.00	6,196.81	6,244.38	6,213.77	10.73	11.51	-171.25		4,346.57	621.97	4,386.02	4,363.80	22.21	197.436		
6,300.00	6,296.80	6,357.08	6,326.42	10.91	11.78	142.71		4,348.46	618.67	4,388.72	4,364.07	22.65	193.657		
6,400.00	6,396.79	6,483.49	6,452.77	11.08	12.07	158.32		4,344.82	614.80	4,387.35	4,364.23	23.12	189.803		
6,500.00	6,496.77	6,587.25	6,556.47	11.25	12.31	158.99		4,343.88	611.45	4,387.83	4,364.30	23.53	186.473		
6,600.00	6,596.76	6,681.84	6,651.01	11.34	12.52	148.31		4,343.05	608.47	4,388.39	4,364.55	23.84	184.100		
6,700.00	6,696.72	6,777.07	6,746.19	11.39	12.75	-115.37		4,342.35	605.43	4,389.12	4,365.02	24.10	182.088		
6,800.00	6,796.68	7,157.72	7,120.12	11.41	13.36	-73.39		4,318.79	675.09	4,386.80	4,362.19	24.71	177.509		
6,900.00	6,892.58	7,205.37	7,150.69	11.46	13.70	-77.98		4,313.35	698.37	4,372.50	4,347.46	25.04	174.615		
7,000.00	6,983.42	7,236.19	7,174.53	11.53	14.09	-80.03		4,309.20	715.45	4,358.84	4,333.45	25.49	170.996		
7,100.00	7,068.57	7,253.00	7,187.08	11.67	14.33	-78.57		4,307.05	726.42	4,342.67	4,318.84	25.83	168.145		
7,200.00	7,147.09	7,284.00	7,209.38	11.96	14.92	-73.88		4,303.51	747.66	4,321.24	4,294.88	26.36	163.917		
7,300.00	7,213.55	7,284.00	7,209.38	12.45	14.92	-74.41		4,303.51	747.66	4,289.75	4,263.13	26.63	161.111		
7,400.00	7,285.52	7,315.00	7,230.56	13.21	15.65	-81.27		4,300.95	770.14	4,257.66	4,229.38	28.30	150.424		
7,500.00	7,299.01	7,315.00	7,230.56	14.30	15.65	-85.31		4,300.95	770.14	4,232.68	4,203.12	29.56	143.175		
7,600.00	7,318.69	7,347.00	7,250.98	15.65	16.57	-87.92		4,299.31	794.71	4,211.00	4,179.14	31.86	132.160		
7,700.00	7,323.61	7,378.00	7,268.93	17.22	17.65	-89.18		4,298.21	819.95	4,191.86	4,157.44	34.43	121.762		
7,800.00	7,323.00	7,409.00	7,285.03	18.92	18.91	-89.66		4,297.45	848.42	4,172.36	4,135.04	37.32	111.804		
7,900.00	7,320.73	7,441.00	7,300.05	20.72	20.39	-89.97		4,297.01	874.67	4,154.67	4,114.06	40.81	102.305		
8,000.00	7,318.17	7,473.00	7,313.60	22.62	22.02	-90.07		4,296.94	903.66	4,140.65	4,098.45	44.19	93.697		
8,100.00	7,318.02	7,518.08	7,330.03	24.58	24.56	-90.12		4,297.41	945.62	4,132.52	4,083.72	48.80	84.679		
8,188.81	7,321.09	7,567.00	7,344.36	26.34	27.56	-90.32		4,298.32	992.38	4,130.34	4,078.75	53.59	77.075 CC		
8,200.00	7,322.06	7,578.33	7,347.17	26.60	28.29	-90.37		4,298.57	1,003.35	4,130.52	4,075.93	54.60	75.655		
8,300.00	7,328.76	7,627.63	7,356.60	28.66	31.80	-90.60		4,300.24	1,051.69	4,133.43	4,073.47	59.66	68.935		
8,400.00	7,336.97	7,724.64	7,366.41	30.75	38.44	-90.78		4,304.26	1,148.11	4,139.62	4,070.75	68.87	60.104		
8,500.00	7,347.56	7,854.69	7,375.10	32.65	47.96	-90.80		4,308.99	1,277.68	4,146.52	4,066.02	80.50	51.511		
8,600.00	7,357.61	7,969.48	7,389.29	34.99	58.51	-90.68		4,312.52	1,391.39	4,153.04	4,061.87	91.17	45.551		
8,700.00	7,366.51	8,068.22	7,383.51	37.14	64.08	-90.52		4,315.48	1,491.04	4,159.73	4,058.76	100.96	41.200		
8,800.00	7,375.09	8,178.38	7,387.83	39.31	72.49	-90.34		4,318.68	1,601.06	4,164.19	4,052.54	111.65	37.298		
8,900.00	7,382.80	8,277.84	7,391.77	41.51	80.13	-90.23		4,321.25	1,700.41	4,167.06	4,045.55	121.51	34.293		
9,000.00	7,390.22	8,435.64	7,396.73	43.71	92.30	-90.10		4,324.71	1,858.09	4,168.78	4,032.86	135.92	30.671		
9,100.00	7,398.61	8,518.48	7,399.30	45.62	98.71	-90.00		4,328.00	1,940.88	4,168.77	4,024.21	144.56	28.839		
9,200.00	7,407.78	8,603.00	7,402.64	48.14	105.26	-89.88		4,327.48	2,025.32	4,168.19	4,014.87	153.32	27.186		
9,300.00	7,417.18	8,697.00	7,408.21	50.36	112.54	-89.81		4,329.52	2,119.13	4,167.05	4,004.24	162.82	25.583		
9,400.00	7,424.63	8,816.27	7,416.38	52.60	121.79	-89.79		4,331.82	2,238.10	4,165.09	3,990.81	174.27	23.900		
9,500.00	7,430.92	8,886.00	7,420.82	54.84	127.20	-89.84		4,333.39	2,307.67	4,163.47	3,981.52	181.96	22.882		
9,526.40	7,432.62	8,907.42	7,422.10	55.43	128.86	-89.85		4,333.93	2,329.04	4,163.40	3,978.18	184.22	22.600		
9,600.00	7,437.64	8,960.48	7,425.01	57.08	132.98	-89.89		4,335.46	2,381.88	4,164.06	3,974.07	189.99	21.917		
9,700.00	7,443.77	9,043.25	7,429.41	59.33	139.41	-89.85		4,338.28	2,464.60	4,165.78	3,967.10	198.68	20.967		

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



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Corn - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)													Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 6876-PHX-MWD-BGGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Reference		Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation	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)	Separation (usft)		
9,800.00	7,449.69	9,144.02	7,435.97	61.59	147.24	-89.83		4,341.88	2,566.10	4,166.77	3,958.00	208.77	19.959	
9,900.00	7,457.20	9,307.95	7,448.00	63.85	159.97	-89.87		4,345.91	2,728.53	4,166.59	3,942.83	223.76	18.621	
9,907.40	7,457.82	9,313.29	7,448.37	64.01	160.39	-89.87		4,346.02	2,733.85	4,166.59	3,942.25	224.34	18.572	
10,000.00	7,466.07	9,395.39	7,453.58	66.10	166.78	-89.86		4,347.91	2,816.77	4,167.02	3,934.20	232.82	17.898	
10,100.00	7,475.14	9,499.89	7,460.16	68.36	174.91	-89.85		4,350.17	2,920.04	4,167.79	3,924.59	243.20	17.137	
10,200.00	7,483.36	9,640.60	7,467.58	70.62	185.88	-89.85		4,352.82	3,060.52	4,169.27	3,912.90	256.37	16.263	
10,300.00	7,490.86	9,771.49	7,472.32	72.89	196.10	-89.80		4,353.80	3,191.32	4,170.84	3,902.04	268.80	15.517	
10,400.00	7,497.41	9,858.32	7,473.89	75.16	202.88	-89.76		4,354.19	3,278.13	4,172.48	3,894.66	277.82	15.019	
10,500.00	7,504.81	9,926.16	7,474.21	77.43	208.18	-89.74		4,355.00	3,345.97	4,175.39	3,890.02	285.36	14.632	
10,600.00	7,513.57	10,052.57	7,474.59	79.71	218.06	-89.58		4,356.17	3,472.37	4,177.92	3,880.38	297.53	14.042	
10,700.00	7,520.58	10,165.72	7,474.55	81.98	228.91	-89.42		4,357.36	3,585.51	4,180.43	3,871.75	308.69	13.543	
10,800.00	7,524.92	10,268.86	7,475.40	84.26	236.54	-89.37		4,357.46	3,708.65	4,181.90	3,861.39	320.51	13.047	
10,900.00	7,528.99	10,362.72	7,475.47	86.55	242.31	-89.31		4,357.66	3,782.51	4,184.23	3,856.83	328.60	12.734	
11,000.00	7,531.40	10,423.59	7,475.01	88.83	247.07	-89.25		4,358.27	3,843.38	4,186.64	3,851.16	335.69	12.472	
11,100.00	7,533.81	10,485.00	7,474.54	91.12	251.87	-89.25		4,359.59	3,904.77	4,189.85	3,846.98	342.87	12.220	
11,200.00	7,536.27	10,543.19	7,473.92	93.41	256.42	-89.23		4,361.41	3,962.93	4,193.26	3,843.57	349.70	11.991	
11,300.00	7,541.75	10,626.17	7,472.49	95.69	262.91	-89.10		4,364.52	4,045.84	4,197.37	3,838.90	356.47	11.709	
11,400.00	7,541.59	10,801.47	7,471.32	97.98	276.61	-89.02		4,369.60	4,221.06	4,200.23	3,825.74	374.48	11.216	
11,500.00	7,538.19	10,880.81	7,470.63	100.27	282.82	-89.02		4,371.50	4,300.36	4,202.34	3,819.35	382.99	10.973	
11,600.00	7,534.20	10,992.81	7,469.99	102.56	291.56	-89.10		4,374.15	4,412.34	4,203.98	3,809.92	394.06	10.668	
11,700.00	7,533.86	11,088.94	7,469.79	104.85	298.95	-89.16		4,376.31	4,506.44	4,205.95	3,802.29	403.66	10.420	
11,800.00	7,539.33	11,199.63	7,469.45	107.14	307.77	-89.19		4,379.05	4,619.10	4,209.36	3,794.73	414.62	10.152	
11,900.00	7,545.80	11,321.75	7,469.68	109.43	317.33	-89.09		4,381.19	4,741.20	4,213.12	3,788.75	426.38	9.881	
12,000.00	7,551.61	11,501.49	7,471.18	111.72	331.40	-89.84		4,381.62	4,920.92	4,215.12	3,772.30	442.82	9.516	
12,100.00	7,558.85	11,602.74	7,471.61	114.01	339.33	-89.79		4,381.47	5,022.17	4,215.81	3,762.43	453.18	9.302	
12,200.00	7,569.38	11,689.00	7,471.60	116.29	346.08	-88.59		4,381.30	5,108.43	4,214.63	3,752.40	462.23	9.118	
12,300.00	7,579.82	11,759.00	7,471.68	118.57	351.56	-88.48		4,381.30	5,178.43	4,213.47	3,743.50	469.97	8.965 ES, SF	

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



Phoenix Technology Services LP Anticollision Report

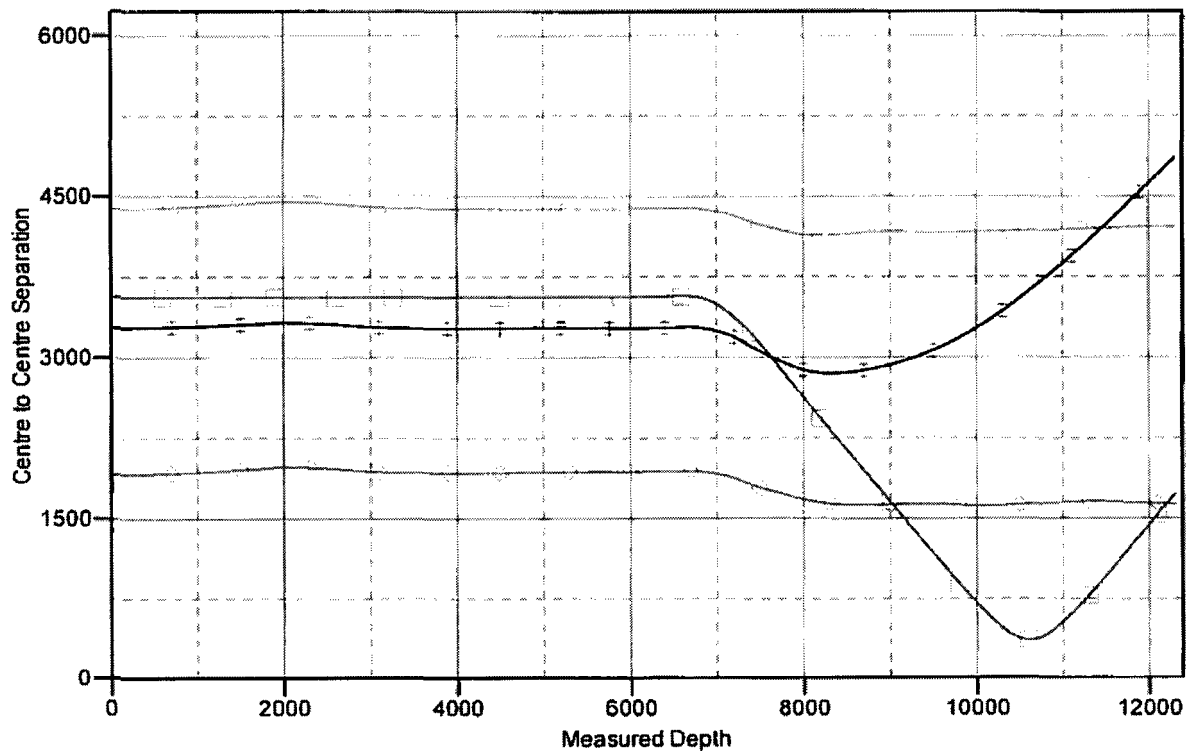


Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #2H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61176
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #2H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL + KB @ 3446.00usft (H&P 482) Coordinates are relative to: #2H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is 104° 19' 60.00000 W Grid Convergence at Surface is: 0.10°

Ladder Plot



LEGEND

218, OH, Surveys V0
11, OH, Surveys V0

4H, WB1/Job #1411413, Surveys (Pioneer 28) V0
1H, WB1/Job #1411057, Surveys (Pioneer 28) V0



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
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