Apache Corporation

Eddy County, NM (NAD27 NME)
Crow Federal #12H API#30-015-40576 1013'FSL & 250'FWL ULL: M 10-17S-31E
OH/Job #1310847

Survey: Phoneix MWD Survey

Phoenix Final Survey Report

06 August, 2013

RECEIVED
DEC 20 2013
NMOCD ARTESIA

PHOENIX
TECHNOLOGY SERVICES

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Well #12H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	**MD Reference:**	KB @ 3897.00usft (Capstar 114)
Well:	#12H	**North Reference:**	Grid
Wellbore:	OH/Job #1310847	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys (Capstar 114)	**Database:**	GCR DB

Project Eddy County, NM (NAD27 NME)

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Crow Federal

Site Position:		**Northing:**	671,130.90 usft	**Latitude:**	32° 50' 38.927956 N
From:	Map	**Easting:**	643,906.80 usft	**Longitude:**	103° 51' 53.166888 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.25 °

Well #12H

Well Position	**+N/-S**	0.00 usft	**Northing:**	671,260.90 usft	**Latitude:**	32° 50' 40.214349 N
	+E/-W	0.00 usft	**Easting:**	643,906.00 usft	**Longitude:**	103° 51' 53.169507 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,886.00 usft

Wellbore OH/Job #1310847

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	04/25/12	7.66	60.69	48,868

Design Surveys (Capstar 114)

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	89.57

Survey Program **Date** 08/06/13

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	500.00	Gyrodata Survey (OH/Job #1310847)	NS-GYRO-MS	North sensing gyrocompassing m/s
608.00	10,687.00	Phoneix MWD Survey (OH/Job #1310847)	MWD	MWD - Standard

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
500.00	0.78	199.76	499.98	-3.48	-0.76	-0.79	0.00
Tie-on to Gyrodata							
608.00	0.80	188.40	607.97	-4.92	-1.12	-1.16	0.15
First Phoenix MWD Survey							
693.00	1.60	145.90	692.96	-6.49	-0.54	-0.59	1.35
779.00	3.00	121.20	778.89	-8.65	2.05	1.99	1.96
864.00	3.60	101.00	863.75	-10.31	6.58	6.50	1.53
950.00	4.10	85.30	949.56	-10.57	12.29	12.21	1.35
1,036.00	4.60	85.00	1,035.31	-10.02	18.79	18.71	0.58
1,121.00	5.00	86.80	1,120.01	-9.52	25.88	25.81	0.50
1,207.00	5.60	86.80	1,205.64	-9.07	33.82	33.75	0.70

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Well #12H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	**MD Reference:**	KB @ 3897.00usft (Capstar 114)
Well:	#12H	**North Reference:**	Grid
Wellbore:	OH/Job #1310847	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys (Capstar 114)	**Database:**	GCR DB

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,292.00	4.10	94.10	1,290.34	-9.06	40.99	40.92	1.90
1,378.00	2.20	87.20	1,376.20	-9.20	45.70	45.63	2.25
1,463.00	2.20	83.30	1,461.14	-8.93	48.95	48.89	0.18
1,549.00	2.40	83.20	1,547.07	-8.52	52.38	52.32	0.23
1,635.00	2.40	90.20	1,632.99	-8.32	55.97	55.91	0.34
1,720.00	1.10	60.20	1,717.95	-7.92	58.46	58.40	1.82
1,805.00	0.60	331.80	1,802.95	-7.12	58.96	58.90	1.46
1,890.00	0.80	322.60	1,887.94	-6.26	58.38	58.34	0.27
1,976.00	1.00	317.90	1,973.93	-5.22	57.52	57.48	0.25
2,061.00	0.80	311.90	2,058.92	-4.28	56.58	56.54	0.26
2,147.00	0.90	331.70	2,144.91	-3.28	55.81	55.78	0.36
2,233.00	1.00	320.10	2,230.90	-2.11	55.01	54.99	0.25
2,318.00	1.10	328.80	2,315.88	-0.84	54.11	54.10	0.22
2,403.00	1.10	320.20	2,400.87	0.48	53.17	53.17	0.19
2,489.00	1.10	325.40	2,486.85	1.80	52.17	52.18	0.12
2,575.00	1.20	330.60	2,572.84	3.26	51.26	51.28	0.17
2,660.00	1.50	335.80	2,657.81	5.05	50.36	50.40	0.38
2,746.00	0.60	351.00	2,743.80	6.52	49.83	49.88	1.09
2,831.00	0.50	355.90	2,828.79	7.33	49.74	49.79	0.13
2,916.00	0.90	343.00	2,913.79	8.34	49.51	49.58	0.50
3,001.00	0.40	65.30	2,998.78	9.10	49.59	49.66	1.10
3,087.00	0.60	101.90	3,084.78	9.13	50.30	50.37	0.43
3,173.00	0.50	69.40	3,170.78	9.17	51.09	51.16	0.37
3,258.00	0.70	54.10	3,255.77	9.61	51.86	51.93	0.30
3,342.00	0.80	49.80	3,339.76	10.29	52.73	52.80	0.14
3,467.00	1.00	38.80	3,464.75	11.70	54.08	54.16	0.21
3,553.00	1.40	189.40	3,550.74	11.25	54.37	54.46	2.70
3,639.00	0.90	192.20	3,636.72	9.55	54.06	54.13	0.58
3,724.00	0.70	202.90	3,721.71	8.42	53.72	53.78	0.29
3,810.00	0.70	205.00	3,807.71	7.46	53.29	53.35	0.03
3,895.00	0.80	195.30	3,892.70	6.42	52.91	52.96	0.19
3,981.00	0.70	194.60	3,978.69	5.33	52.62	52.66	0.12
4,066.00	0.50	173.50	4,063.69	4.46	52.53	52.57	0.35
4,152.00	0.50	164.00	4,149.69	3.73	52.68	52.71	0.10
4,238.00	0.50	155.50	4,235.68	3.02	52.94	52.96	0.09
4,323.00	0.70	150.60	4,320.68	2.23	53.35	53.36	0.24
4,409.00	0.70	133.60	4,406.67	1.41	53.99	54.00	0.24
4,494.00	0.80	138.10	4,491.66	0.62	54.76	54.76	0.14
4,580.00	0.70	134.50	4,577.66	-0.20	55.53	55.53	0.13
4,665.00	0.70	138.80	4,662.65	-0.95	56.25	56.24	0.06
4,751.00	0.70	145.50	4,748.64	-1.78	56.89	56.88	0.10
4,837.00	0.80	145.60	4,834.64	-2.71	57.53	57.51	0.12
4,922.00	0.70	151.70	4,919.63	-3.66	58.11	58.08	0.15
5,008.00	1.10	308.60	5,005.63	-3.61	57.71	57.68	2.05

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Well #12H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	**MD Reference:**	KB @ 3897.00usft (Capstar 114)
Well:	#12H	**North Reference:**	Grid
Wellbore:	OH/Job #1310847	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys (Capstar 114)	**Database:**	GCR DB

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,093.00	1.30	308.80	5,090.61	-2.49	56.32	56.30	0.24
5,179.00	1.10	315.70	5,176.59	-1.29	54.99	54.98	0.29
5,264.00	1.10	323.70	5,261.57	-0.05	53.93	53.93	0.18
5,350.00	1.00	323.70	5,347.56	1.22	53.00	53.01	0.12
5,436.00	1.00	323.30	5,433.54	2.43	52.11	52.12	0.01
5,521.00	1.00	325.10	5,518.53	3.63	51.24	51.27	0.04
5,607.00	1.10	335.30	5,604.52	5.00	50.47	50.50	0.25
5,692.00	1.10	336.00	5,689.50	6.48	49.79	49.84	0.02
5,738.00	1.10	339.30	5,735.49	7.30	49.46	49.51	0.14
5,780.00	2.10	63.90	5,777.48	8.02	50.01	50.07	5.42
5,823.00	6.70	80.00	5,820.34	8.80	53.19	53.25	10.97
5,866.00	12.00	82.10	5,862.76	9.85	60.09	60.16	12.35
5,909.00	17.40	85.20	5,904.34	11.00	70.93	71.01	12.69
5,952.00	22.80	87.80	5,944.70	11.86	85.68	85.76	12.73
5,995.00	28.40	89.40	5,983.47	12.29	104.24	104.33	13.12
6,037.00	34.00	89.90	6,019.38	12.41	125.99	126.08	13.35
6,080.00	39.60	90.40	6,053.79	12.34	151.74	151.82	13.04
6,123.00	44.20	90.90	6,085.79	12.01	180.44	180.53	10.73
6,166.00	48.70	90.80	6,115.41	11.55	211.60	211.68	10.47
6,209.00	53.70	90.80	6,142.35	11.08	245.09	245.17	11.63
6,251.00	58.40	90.90	6,165.79	10.56	279.92	279.99	11.19
6,293.00	62.60	90.70	6,186.47	10.05	316.46	316.53	10.01
6,336.00	66.80	90.60	6,204.84	9.61	355.33	355.39	9.77
6,379.00	72.00	90.20	6,219.97	9.33	395.56	395.62	12.12
6,422.00	77.50	90.20	6,231.27	9.19	437.03	437.09	12.79
6,462.00	82.60	89.40	6,238.18	9.33	476.42	476.48	12.90
6,518.00	88.80	89.40	6,242.38	9.91	532.23	532.29	11.07
6,604.00	88.80	88.60	6,244.18	11.41	618.20	618.27	0.93
6,689.00	89.00	90.60	6,245.81	12.01	703.18	703.25	2.36
6,774.00	88.70	90.40	6,247.52	11.26	788.16	788.22	0.42
6,860.00	88.50	90.20	6,249.62	10.81	874.13	874.19	0.33
6,946.00	88.20	89.80	6,252.10	10.81	960.09	960.15	0.58
7,031.00	88.20	89.60	6,254.77	11.26	1,045.05	1,045.10	0.24
7,117.00	90.00	89.70	6,256.12	11.78	1,131.03	1,131.09	2.10
7,202.00	89.70	88.80	6,256.34	12.90	1,216.03	1,216.09	1.12
7,288.00	90.10	90.60	6,256.49	13.35	1,302.02	1,302.08	2.14
7,373.00	89.50	90.40	6,256.79	12.60	1,387.02	1,387.07	0.74
7,459.00	89.00	89.90	6,257.91	12.38	1,473.01	1,473.06	0.82
7,545.00	88.50	89.40	6,259.79	12.90	1,558.99	1,559.04	0.82
7,630.00	88.60	88.30	6,261.94	14.61	1,643.94	1,644.00	1.30
7,716.00	88.30	89.90	6,264.27	15.96	1,729.89	1,729.97	1.89
7,801.00	87.60	89.80	6,267.31	16.18	1,814.84	1,814.91	0.83
7,887.00	89.70	91.20	6,269.33	15.43	1,900.81	1,900.87	2.93
7,973.00	89.10	91.20	6,270.23	13.63	1,986.78	1,986.83	0.70

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Well #12H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	**MD Reference:**	KB @ 3897.00usft (Capstar 114)
Well:	#12H	**North Reference:**	Grid
Wellbore:	OH/Job #1310847	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys (Capstar 114)	**Database:**	GCR DB

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
8,058.00	88.60	91.20	6,271.94	11.85	2,071.75	2,071.78	0.59
8,144.00	89.40	90.30	6,273.44	10.73	2,157.72	2,157.74	1.40
8,229.00	89.10	90.60	6,274.55	10.06	2,242.71	2,242.73	0.50
8,315.00	90.20	89.40	6,275.08	10.06	2,328.71	2,328.72	1.89
8,400.00	90.00	89.90	6,274.93	10.58	2,413.71	2,413.72	0.63
8,486.00	89.40	90.20	6,275.38	10.50	2,499.71	2,499.71	0.78
8,572.00	89.40	91.00	6,276.28	9.60	2,585.69	2,585.69	0.93
8,657.00	89.60	89.00	6,277.02	9.60	2,670.69	2,670.68	2.36
8,743.00	89.00	89.20	6,278.07	10.95	2,756.67	2,756.67	0.74
8,828.00	88.70	89.80	6,279.78	11.69	2,841.65	2,841.66	0.79
8,914.00	89.60	89.20	6,281.06	12.45	2,927.63	2,927.65	1.26
9,000.00	88.90	89.00	6,282.18	13.80	3,013.62	3,013.64	0.85
9,085.00	88.60	89.00	6,284.04	15.28	3,098.58	3,098.61	0.35
9,170.00	88.30	88.60	6,286.33	17.06	3,183.53	3,183.57	0.59
9,256.00	89.90	88.40	6,287.68	19.31	3,269.49	3,269.54	1.87
9,340.00	89.30	88.70	6,288.27	21.44	3,353.46	3,353.53	0.80
9,426.00	88.40	88.10	6,290.00	23.84	3,439.41	3,439.49	1.26
9,511.00	90.60	88.80	6,290.74	26.13	3,524.37	3,524.47	2.72
9,597.00	90.10	88.60	6,290.21	28.09	3,610.34	3,610.45	0.63
9,682.00	89.60	88.60	6,290.44	30.16	3,695.32	3,695.44	0.59
9,768.00	89.10	88.20	6,291.41	32.56	3,781.28	3,781.42	0.74
9,854.00	90.60	89.80	6,291.64	34.06	3,867.26	3,867.41	2.55
9,944.00	89.90	89.90	6,291.24	34.30	3,957.26	3,957.40	0.79
10,031.00	88.80	89.70	6,292.23	34.60	4,044.25	4,044.40	1.29
10,121.00	88.70	90.00	6,294.19	34.84	4,134.23	4,134.37	0.35
10,212.00	88.50	89.80	6,296.42	35.00	4,225.20	4,225.35	0.31
10,297.00	90.00	89.70	6,297.53	35.37	4,310.19	4,310.34	1.77
10,389.00	89.40	89.50	6,298.01	36.01	4,402.19	4,402.33	0.69
10,480.00	88.90	89.90	6,299.36	36.49	4,493.18	4,493.32	0.70
10,567.00	88.50	89.80	6,301.34	36.72	4,580.15	4,580.30	0.47
10,631.00	88.50	90.10	6,303.01	36.77	4,644.13	4,644.28	0.47
Last Phoenix MWD Survey							
10,687.00	88.50	90.10	6,304.48	36.67	4,700.11	4,700.25	0.00
Projection to TD							

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Well #12H
Project:	Eddy County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	**MD Reference:**	KB @ 3897.00usft (Capstar 114)
Well:	#12H	**North Reference:**	Grid
Wellbore:	OH/Job #1310847	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys (Capstar 114)	**Database:**	GCR DB

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
500.00	499.98	-3.48	-0.76	Tie-on to Gyrodata
608.00	607.97	-4.92	-1.12	First Phoenix MWD Survey
10,631.00	6,303.01	36.77	4,644.13	Last Phoenix MWD Survey
10,687.00	6,304.48	36.67	4,700.11	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

Phoenix Technology Services
SURVEY DATA CERTIFICATION

PHOENIX TECHNOLOGY SERVICES

PHOENIX JOB NUMBER	1310847	OPERATOR	Apache Corporation
WELL NAME	Crow Federal 12H	COUNTY & STATE	Eddy County,NM
API WELL NUMBER *	30-015-40576	PROPOSED DIRECTION	89.57

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
500 ft	499.98 ft	.78 ft	199.8 ft	3.48 S	0.76 W	Gyro

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
22-Jul-13	608 ft	0.8	188.4

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
5-Aug-13	10,631 ft	88.5	90.1

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
5-Aug-13	10,687 ft	88.5	90.1

TO THE BEST OF MY KNOWLEDGE I CERTIFY THIS SURVEY DATA TO BE TRUE AND CORRECT.

Bernard Caldwell

PRINT YOUR NAME ABOVE

B. Caldwell

SIGN YOUR NAME ABOVE

8-5-13

TODAY'S DATE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.41
DECLINATION OR GRID	GRID

MWD SUPERVISOR 1	B.Caldwell/B.Hill	DIRECTIONAL DRILLER 1	Matt Boyt
MWD SUPERVISOR 2	M.Dice/M.Colvin	DIRECTIONAL DRILLER 2	Ken Smith

1805 Brittmore Road Houston, Texas 77043 (713)3370609 (Voice), (713)337-0599 (Fax)

Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #12H
Wellbore: OH/Job #1310847
Design: Plan#3 07-09-13
Rig: Capstar 114

PHOENIX TECHNOLOGY SERVICES

Azimuths to Grid North
True North: -0.25°
Magnetic North: 7.41°

Magnetic Field
Strength: 48867.9snT
Dip Angle: 60.69°
Date: 04/25/2012
Model: IGRF2010_14

WELL DETAILS

Ground Level: 3886.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	671260.90	643906.00	32° 50' 40.214349 N	103° 51' 53.169507 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	675.00	0.00	0.00	675.00	0.00	0.00	0.00	0.00	0.00		Start Build 2.00
3	875.00	4.00	89.57	874.84	0.05	6.98	2.00	89.57	6.98		Start 500.00 hold at 875.00 MD
4	1375.00	4.00	89.57	1373.62	0.31	41.86	0.00	0.00	41.86		Start Drop -1.50
5	1641.67	0.00	0.00	1640.07	0.38	51.16	1.50	180.00	51.16		Start 4129.51 hold at 1641.67 MD
6	5771.18	0.00	0.00	5769.58	0.38	51.16	0.00	0.00	51.16		KOP Start DLS 12.00 TFO 89.57
7	6514.47	89.19	89.57	6247.00	3.95	521.90	12.00	89.57	521.91		LP Start 1778.26 hold at 6514.47 MD
8	8292.73	89.19	89.57	6272.00	17.42	2299.93	0.00	0.00	2300.00	Mid Pt Crow Fed #12H	Start DLS 2.00 TFO 0.01
9	8303.19	89.40	89.57	6272.13	17.50	2310.40	2.00	0.01	2310.46		Start 2390.20 hold at 8303.19 MD
10	10693.39	89.40	89.57	6297.00	35.60	4700.40	0.00	0.00	4700.53	PBHL-Crow Fed #12H	TD at 10693.39

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Mid Pt Crow Fed #12H	6272.00 - plan hits target center	17.42	2299.93	671278.32	646205.93	32° 50' 40.284955 N	103° 51' 26.210128 W	Rectangle (Sides: L30.00 W50.00)
PBHL-Crow Fed #12H	6297.00 - plan hits target center	35.60	4700.40	671296.50	648606.40	32° 50' 40.356945 N	103° 50' 58.072343 W	Rectangle (Sides: L30.00 W50.00)

PROJECT DETAILS: Eddy County, NM (NAD27 NME)

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

SITE DETAILS: Crow Federal

Site Centre Northing: 671130.90
Easting: 643906.80

Positional Uncertainty: 0.00
Convergence: 0.25
Local North: Grid

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
512.00	512.00	Rustler		
683.00	683.00	T/Salt		
1687.00	1688.60	B/Salt		
1854.00	1855.60	Yates		
2136.00	2137.60	Seven Rivers		
2763.00	2764.60	Queen		
3188.00	3189.60	Grayburg		
3523.00	3524.60	San Andres		
5003.00	5004.60	Glorieta		
5057.00	5058.60	(Yeso) Paddock		
5615.00	5616.60	Blinebry		

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well #12H, Grid North

Latitude: 32° 50' 40.214349 N
Longitude: 103° 51' 53.169507 W

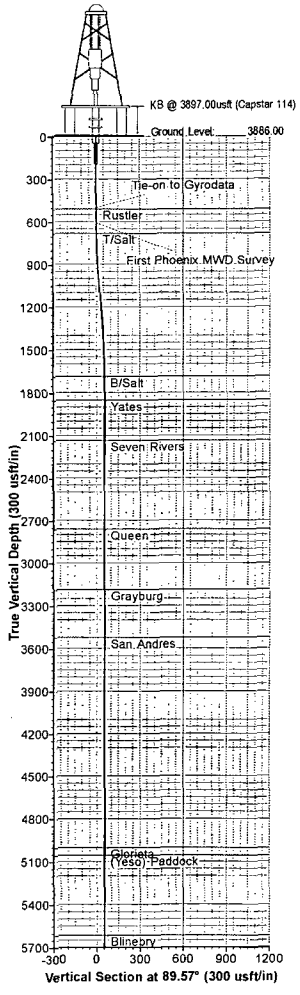
Grid East: 643906.00
Grid North: 671260.90
Scale Factor: 1.000

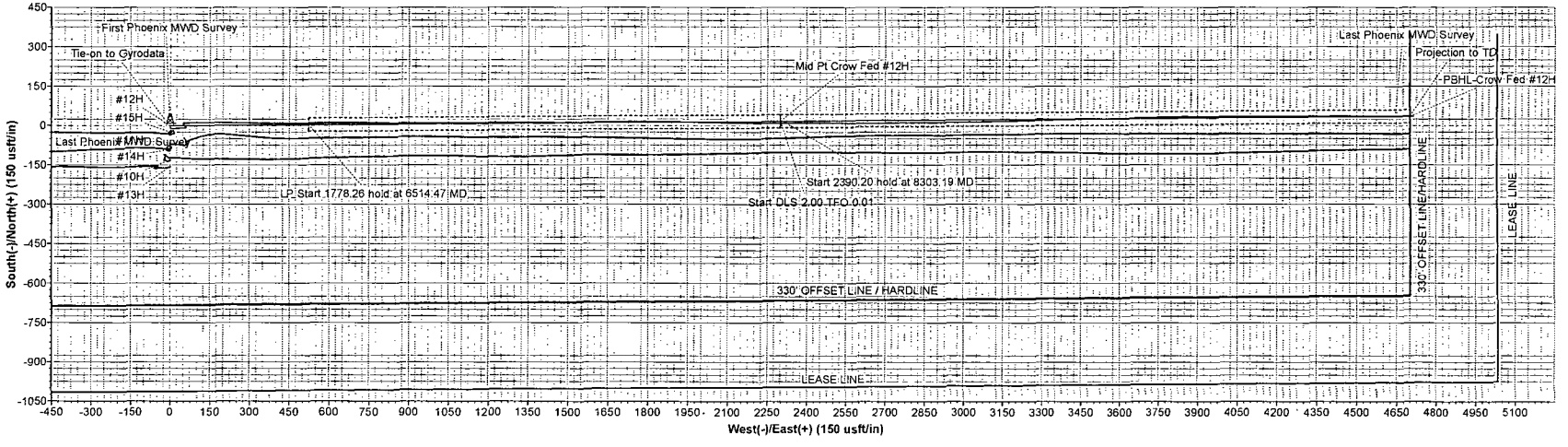
Geomagnetic Model: IGRF2010_14
Sample Date: 25-Apr-12
Magnetic Declination: 7.66°
Dip Angle from Horizontal: 60.69°
Magnetic Field Strength: 48868

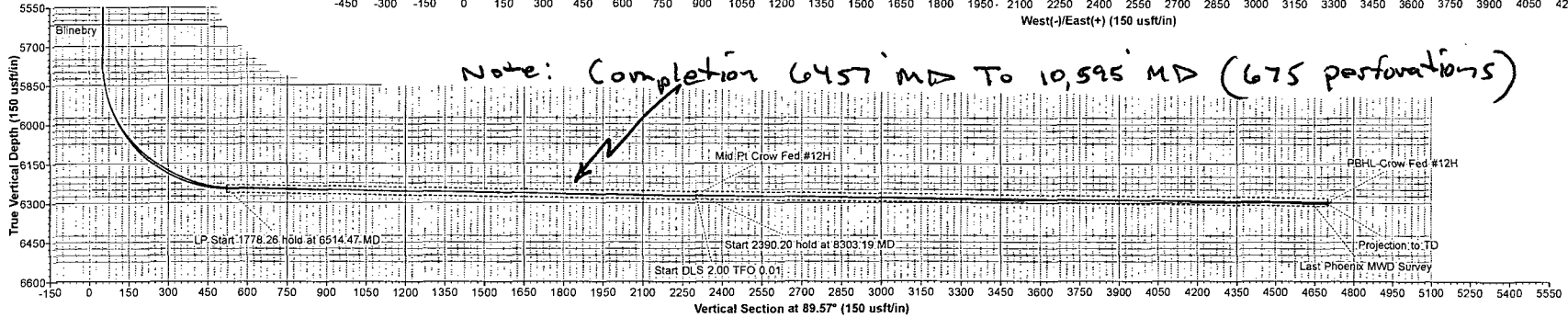
To convert a Magnetic Direction to a Grid Direction, Add 7.41°
To convert a Magnetic Direction to a True Direction, Add 7.66° East
To convert a True Direction to a Grid Direction, Subtract 0.25°

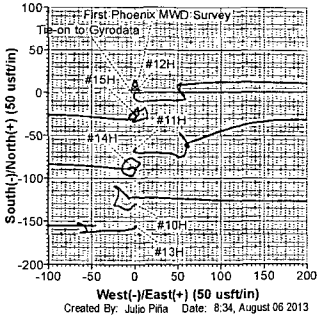
LEGEND

- #12H, OH/Job #1310847, Surveys (Capstar 114) V0
- #10H, OH / Job #1310298, Surveys (Capstar 114) V0
- #11H, OH/Job #1310714, Surveys (Capstar 114) V0
- #13H, OH / Job #1310316, Surveys (Capstar 114) V0
- #14H, OH/Job #1310557, Surveys (Capstar 114) V0
- #15H, OH/Job #1310461, Surveys (Capstar 114) V0
- Plan#3 07-09-13









Created By: Julio Pina Date: 8:34, August 06 2013

Apache Corporation

Eddy County, NM
Crow Federal 12H
Job # 1210350

API # 30-015-40576
1013' FSL + 250' FWL UL: M 10-17S-31E

Wellbore #1
Plan 1 4-25-2012

Anticollision Report

25 April, 2012

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Reference Plan 1 4-25-2012

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 04/25/12

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	10,808.05	Plan 1 4-25-2012 (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Crow Federal 10H						
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,800.00	4,800.00	130.00	108.65	6.088	CC
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,826.36	4,826.32	130.01	108.54	6.057	ES
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,900.00	4,897.75	130.66	108.88	5.999	SF
Crow Federal 11H						
Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012	5,446.36	5,446.36	65.00	40.74	2.680	CC
Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012	5,500.00	5,499.48	65.19	40.70	2.662	ES, SF
Crow Federal 13H						
Well #1 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	155.00	154.33	229.873	CC
Well #1 - Wellbore #1 - Plan 1 4-25-2012	4,800.00	4,801.40	163.26	142.15	7.735	ES, SF
Crow federal 14H						
Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	90.00	89.33	133.474	CC
Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012	5,400.00	5,401.60	103.57	79.76	4.351	ES, SF
Crow Federal 15H						
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	25.00	24.33	37.076	CC
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	300.00	299.96	25.07	23.95	22.488	ES
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	5,800.00	5,800.00	57.50	31.88	2.244	SF

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012

Survey Program: 0-MWD

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	179.65	-130.00	0.80	130.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.65	-130.00	0.80	130.00	129.78	0.22	578.390	
200.00	200.00	200.00	200.00	0.34	0.34	179.65	-130.00	0.80	130.00	129.33	0.67	192.797	
300.00	300.00	300.00	300.00	0.56	0.56	179.65	-130.00	0.80	130.00	128.88	1.12	115.678	
400.00	400.00	400.00	400.00	0.79	0.79	179.65	-130.00	0.80	130.00	128.43	1.57	82.627	
500.00	500.00	500.00	500.00	1.01	1.01	179.65	-130.00	0.80	130.00	127.98	2.02	64.266	
600.00	600.00	600.00	600.00	1.24	1.24	179.65	-130.00	0.80	130.00	127.53	2.47	52.581	
700.00	700.00	700.00	700.00	1.46	1.46	179.65	-130.00	0.80	130.00	127.08	2.92	44.492	
800.00	800.00	800.00	800.00	1.69	1.69	179.65	-130.00	0.80	130.00	126.63	3.37	38.559	

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

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
900.00	900.00	900.00	900.00	1.91	1.91	179.65	-130.00	0.80	130.00	126.18	3.82	34.023	
1,000.00	1,000.00	1,000.00	1,000.00	2.14	2.14	179.65	-130.00	0.80	130.00	125.73	4.27	30.442	
1,100.00	1,100.00	1,100.00	1,100.00	2.36	2.36	179.65	-130.00	0.80	130.00	125.28	4.72	27.542	
1,200.00	1,200.00	1,200.00	1,200.00	2.58	2.58	179.65	-130.00	0.80	130.00	124.83	5.17	25.147	
1,300.00	1,300.00	1,300.00	1,300.00	2.81	2.81	179.65	-130.00	0.80	130.00	124.38	5.62	23.136	
1,400.00	1,400.00	1,400.00	1,400.00	3.03	3.03	179.65	-130.00	0.80	130.00	123.93	6.07	21.422	
1,500.00	1,500.00	1,500.00	1,500.00	3.26	3.26	179.65	-130.00	0.80	130.00	123.48	6.52	19.944	
1,600.00	1,600.00	1,600.00	1,600.00	3.48	3.48	179.65	-130.00	0.80	130.00	123.03	6.97	18.658	
1,700.00	1,700.00	1,700.00	1,700.00	3.71	3.71	179.65	-130.00	0.80	130.00	122.59	7.42	17.527	
1,800.00	1,800.00	1,800.00	1,800.00	3.93	3.93	179.65	-130.00	0.80	130.00	122.14	7.87	16.525	
1,900.00	1,900.00	1,900.00	1,900.00	4.16	4.16	179.65	-130.00	0.80	130.00	121.69	8.32	15.632	
2,000.00	2,000.00	2,000.00	2,000.00	4.38	4.38	179.65	-130.00	0.80	130.00	121.24	8.77	14.831	
2,100.00	2,100.00	2,100.00	2,100.00	4.61	4.61	179.65	-130.00	0.80	130.00	120.79	9.22	14.107	
2,200.00	2,200.00	2,200.00	2,200.00	4.83	4.83	179.65	-130.00	0.80	130.00	120.34	9.66	13.451	
2,300.00	2,300.00	2,300.00	2,300.00	5.06	5.06	179.65	-130.00	0.80	130.00	119.89	10.11	12.853	
2,400.00	2,400.00	2,400.00	2,400.00	5.28	5.28	179.65	-130.00	0.80	130.00	119.44	10.56	12.306	
2,500.00	2,500.00	2,500.00	2,500.00	5.51	5.51	179.65	-130.00	0.80	130.00	118.99	11.01	11.804	
2,600.00	2,600.00	2,600.00	2,600.00	5.73	5.73	179.65	-130.00	0.80	130.00	118.54	11.46	11.341	
2,700.00	2,700.00	2,700.00	2,700.00	5.96	5.96	179.65	-130.00	0.80	130.00	118.09	11.91	10.913	
2,800.00	2,800.00	2,800.00	2,800.00	6.18	6.18	179.65	-130.00	0.80	130.00	117.64	12.36	10.516	
2,900.00	2,900.00	2,900.00	2,900.00	6.41	6.41	179.65	-130.00	0.80	130.00	117.19	12.81	10.147	
3,000.00	3,000.00	3,000.00	3,000.00	6.63	6.63	179.65	-130.00	0.80	130.00	116.74	13.26	9.803	
3,100.00	3,100.00	3,100.00	3,100.00	6.86	6.86	179.65	-130.00	0.80	130.00	116.29	13.71	9.482	
3,200.00	3,200.00	3,200.00	3,200.00	7.08	7.08	179.65	-130.00	0.80	130.00	115.84	14.16	9.181	
3,300.00	3,300.00	3,300.00	3,300.00	7.30	7.30	179.65	-130.00	0.80	130.00	115.39	14.61	8.898	
3,400.00	3,400.00	3,400.00	3,400.00	7.53	7.53	179.65	-130.00	0.80	130.00	114.94	15.06	8.633	
3,500.00	3,500.00	3,500.00	3,500.00	7.75	7.75	179.65	-130.00	0.80	130.00	114.49	15.51	8.382	
3,600.00	3,600.00	3,600.00	3,600.00	7.98	7.98	179.65	-130.00	0.80	130.00	114.04	15.96	8.146	
3,700.00	3,700.00	3,700.00	3,700.00	8.20	8.20	179.65	-130.00	0.80	130.00	113.59	16.41	7.923	
3,800.00	3,800.00	3,800.00	3,800.00	8.43	8.43	179.65	-130.00	0.80	130.00	113.15	16.86	7.712	
3,900.00	3,900.00	3,900.00	3,900.00	8.65	8.65	179.65	-130.00	0.80	130.00	112.70	17.31	7.512	
4,000.00	4,000.00	4,000.00	4,000.00	8.88	8.88	179.65	-130.00	0.80	130.00	112.25	17.76	7.321	
4,100.00	4,100.00	4,100.00	4,100.00	9.10	9.10	179.65	-130.00	0.80	130.00	111.80	18.21	7.141	
4,200.00	4,200.00	4,200.00	4,200.00	9.33	9.33	179.65	-130.00	0.80	130.00	111.35	18.66	6.969	
4,300.00	4,300.00	4,300.00	4,300.00	9.55	9.55	179.65	-130.00	0.80	130.00	110.90	19.11	6.805	
4,400.00	4,400.00	4,400.00	4,400.00	9.78	9.78	179.65	-130.00	0.80	130.00	110.45	19.55	6.648	
4,500.00	4,500.00	4,500.00	4,500.00	10.00	10.00	179.65	-130.00	0.80	130.00	110.00	20.00	6.499	
4,600.00	4,600.00	4,600.00	4,600.00	10.23	10.23	179.65	-130.00	0.80	130.00	109.55	20.45	6.356	
4,700.00	4,700.00	4,700.00	4,700.00	10.45	10.45	179.65	-130.00	0.80	130.00	109.10	20.90	6.219	
4,800.00	4,800.00	4,800.00	4,800.00	10.68	10.68	179.65	-130.00	0.80	130.00	108.65	21.35	6.088 CC	
4,826.36	4,826.36	4,826.32	4,826.30	10.74	10.73	179.20	-129.99	1.81	130.01	108.54	21.46	6.057 ES	
4,900.00	4,900.00	4,897.75	4,896.64	10.90	10.88	174.01	-129.90	13.62	130.66	108.88	21.78	5.999 SF	
5,000.00	5,000.00	4,983.99	4,976.79	11.13	11.08	160.88	-129.67	44.96	139.19	117.00	22.19	6.272	
5,100.00	5,100.00	5,053.82	5,035.23	11.35	11.30	147.32	-129.38	83.00	166.80	144.21	22.59	7.384	
5,200.00	5,200.00	5,108.11	5,075.31	11.58	11.55	137.20	-129.11	119.55	215.66	192.66	23.00	9.378	
5,300.00	5,300.00	5,150.00	5,102.45	11.80	11.79	130.40	-128.87	151.42	280.29	256.87	23.42	11.967	
5,400.00	5,400.00	5,182.48	5,121.00	12.02	12.04	125.85	-128.67	178.07	355.11	331.26	23.86	14.886	
5,500.00	5,500.00	5,208.13	5,134.01	12.25	12.26	122.70	-128.50	200.17	436.50	412.22	24.28	17.978	
5,600.00	5,600.00	5,225.00	5,141.75	12.47	12.42	120.83	-128.39	215.16	522.28	497.63	24.65	21.187	
5,700.00	5,700.00	5,250.00	5,151.98	12.70	12.69	118.32	-128.22	237.97	611.07	585.94	25.12	24.323	
5,800.00	5,800.00	5,259.39	5,155.43	12.92	12.80	117.45	-128.15	246.71	701.97	676.51	25.45	27.580	
5,888.20	5,888.20	5,275.00	5,160.69	13.12	12.98	116.10	-128.04	261.40	783.58	757.75	25.83	30.340	

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

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,900.00	5,900.00	5,275.00	5,160.69	13.15	12.98	24.68	-128.04	261.40	794.48	769.54	24.95	31.846	
5,925.00	5,924.94	5,275.00	5,160.69	13.20	12.98	21.44	-128.04	261.40	817.24	792.37	24.87	32.854	
5,950.00	5,949.73	5,275.00	5,160.69	13.25	12.98	18.92	-128.04	261.40	839.49	814.75	24.74	33.936	
5,975.00	5,974.25	5,275.00	5,160.69	13.30	12.98	16.92	-128.04	261.40	861.16	836.63	24.53	35.111	
6,000.00	5,998.41	5,285.56	5,163.91	13.35	13.12	15.03	-127.97	271.46	882.01	857.75	24.26	36.361	
6,025.00	6,022.09	5,289.92	5,165.15	13.41	13.18	13.66	-127.94	275.63	902.20	878.30	23.90	37.751	
6,050.00	6,045.20	5,300.00	5,167.85	13.46	13.31	12.44	-127.86	285.34	921.66	898.18	23.47	39.263	
6,075.00	6,067.64	5,300.00	5,167.85	13.53	13.31	11.58	-127.86	285.34	940.17	917.22	22.96	40.955	
6,100.00	6,089.31	5,300.00	5,167.85	13.59	13.31	10.85	-127.86	285.34	957.90	935.53	22.37	42.827	
6,125.00	6,110.12	5,309.67	5,170.20	13.67	13.44	10.13	-127.79	294.72	974.64	952.91	21.73	44.851	
6,150.00	6,129.97	5,315.09	5,171.41	13.75	13.52	9.56	-127.75	300.01	990.46	969.43	21.03	47.106	
6,175.00	6,148.80	5,325.00	5,173.43	13.85	13.66	9.05	-127.68	309.71	1,005.32	985.04	20.28	49.574	
6,200.00	6,166.50	5,325.00	5,173.43	13.96	13.66	8.67	-127.68	309.71	1,019.10	999.64	19.46	52.359	
6,225.00	6,183.01	5,325.00	5,173.43	14.08	13.66	8.34	-127.68	309.71	1,031.95	1,013.34	18.61	55.449	
6,250.00	6,198.26	5,338.21	5,175.74	14.23	13.86	8.00	-127.58	322.71	1,043.54	1,025.77	17.77	58.732	
6,275.00	6,212.19	5,350.00	5,177.41	14.39	14.03	7.72	-127.50	334.38	1,054.18	1,037.27	16.91	62.335	
6,300.00	6,224.72	5,350.00	5,177.41	14.58	14.03	7.52	-127.50	334.38	1,063.58	1,047.56	16.03	66.369	
6,325.00	6,235.81	5,350.00	5,177.41	14.80	14.03	7.34	-127.50	334.38	1,071.99	1,056.83	15.16	70.717	
6,350.00	6,245.42	5,362.98	5,178.84	15.04	14.24	7.17	-127.40	347.29	1,079.08	1,064.70	14.38	75.060	
6,375.00	6,253.49	5,375.00	5,179.77	15.30	14.43	7.04	-127.31	359.27	1,085.13	1,071.47	13.66	79.452	
6,400.00	6,260.00	5,375.00	5,179.77	15.59	14.43	6.95	-127.31	359.27	1,089.90	1,076.91	12.99	83.904	
6,425.00	6,264.92	5,390.81	5,180.59	15.91	14.70	6.87	-127.19	375.06	1,093.48	1,080.98	12.50	87.480	
6,450.00	6,268.22	5,415.72	5,181.85	16.25	15.14	6.82	-127.00	399.93	1,095.51	1,083.31	12.20	89.830	
6,475.00	6,269.90	5,440.71	5,183.12	16.61	15.61	6.81	-126.81	424.89	1,095.92	1,083.85	12.07	90.801	
6,478.39	6,270.00	5,444.11	5,183.29	16.65	15.67	6.82	-126.79	428.28	1,095.85	1,083.78	12.07	90.818	
6,497.84	6,270.50	5,463.55	5,184.27	16.95	16.03	6.82	-126.64	447.70	1,095.36	1,083.15	12.21	89.736	
6,500.00	6,270.55	5,465.71	5,184.38	16.98	16.07	6.82	-126.62	449.85	1,095.31	1,083.08	12.22	89.616	
6,600.00	6,273.09	5,565.68	5,189.45	18.66	18.07	6.83	-125.87	549.69	1,092.80	1,079.76	13.04	83.800	
6,700.00	6,275.63	5,665.64	5,194.51	20.58	20.24	6.85	-125.11	649.53	1,090.29	1,076.30	13.99	77.920	
6,800.00	6,278.17	5,765.61	5,199.57	22.67	22.55	6.87	-124.35	749.36	1,087.78	1,072.73	15.05	72.263	
6,900.00	6,280.71	5,865.58	5,204.64	24.88	24.94	6.88	-123.60	849.20	1,085.27	1,069.07	16.20	66.987	
7,000.00	6,283.25	5,965.55	5,209.70	27.20	27.40	6.90	-122.84	949.04	1,082.76	1,065.34	17.42	62.154	
7,100.00	6,285.79	6,065.52	5,214.76	29.59	29.91	6.91	-122.08	1,048.87	1,080.26	1,061.56	18.70	57.776	
7,200.00	6,288.33	6,165.48	5,219.83	32.04	32.46	6.93	-121.33	1,148.71	1,077.75	1,057.73	20.02	53.831	
7,300.00	6,290.87	6,265.45	5,224.89	34.54	35.04	6.95	-120.57	1,248.55	1,075.24	1,053.86	21.38	50.284	
7,400.00	6,293.41	6,365.42	5,229.95	37.07	37.65	6.96	-119.81	1,348.39	1,072.73	1,049.96	22.78	47.095	
7,500.00	6,295.96	6,465.39	5,235.02	39.63	40.27	6.98	-119.06	1,448.22	1,070.23	1,046.03	24.20	44.225	
7,600.00	6,298.50	6,565.36	5,240.08	42.22	42.91	7.00	-118.30	1,548.06	1,067.72	1,042.07	25.64	41.637	
7,700.00	6,301.04	6,665.32	5,245.15	44.82	45.56	7.01	-117.54	1,647.90	1,065.21	1,038.10	27.11	39.297	
7,800.00	6,303.58	6,765.29	5,250.21	47.44	48.23	7.03	-116.79	1,747.73	1,062.70	1,034.12	28.59	37.174	
7,900.00	6,306.12	6,865.26	5,255.27	50.08	50.90	7.05	-116.03	1,847.57	1,060.20	1,030.11	30.08	35.244	
8,000.00	6,308.66	6,965.23	5,260.34	52.73	53.58	7.06	-115.27	1,947.41	1,057.69	1,026.10	31.59	33.484	
8,100.00	6,311.20	7,065.20	5,265.40	55.39	56.27	7.08	-114.52	2,047.24	1,055.18	1,022.08	33.11	31.873	
8,200.00	6,313.74	7,165.16	5,270.46	58.06	58.96	7.10	-113.76	2,147.08	1,052.67	1,018.04	34.63	30.394	
8,300.00	6,316.28	7,265.13	5,275.53	60.73	61.66	7.11	-113.00	2,246.92	1,050.17	1,014.00	36.17	29.034	
8,400.00	6,318.82	7,365.10	5,280.59	63.41	64.36	7.13	-112.25	2,346.75	1,047.66	1,009.95	37.72	27.778	
8,500.00	6,321.36	7,465.07	5,285.65	66.10	67.06	7.15	-111.49	2,446.59	1,045.15	1,005.89	39.27	26.617	
8,600.00	6,323.90	7,565.04	5,290.72	68.79	69.77	7.16	-110.73	2,546.43	1,042.65	1,001.82	40.82	25.540	
8,700.00	6,326.44	7,665.00	5,295.78	71.49	72.49	7.18	-109.98	2,646.27	1,040.14	997.75	42.39	24.538	
8,800.00	6,328.98	7,764.97	5,300.85	74.19	75.20	7.20	-109.22	2,746.10	1,037.63	993.68	43.96	23.605	
8,900.00	6,331.52	7,864.94	5,305.91	76.90	77.92	7.22	-108.46	2,845.94	1,035.13	989.60	45.53	22.733	
9,000.00	6,334.06	7,964.91	5,310.97	79.61	80.64	7.23	-107.70	2,945.78	1,032.62	985.51	47.11	21.918	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012

Survey Program: 0-MWD

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,100.00	6,336.60	8,064.88	5,316.04	82.32	83.36	7.25	-106.95	3,045.61	1,030.12	981.42	48.70	21.154	
9,200.00	6,339.14	8,164.85	5,321.10	85.03	86.08	7.27	-106.19	3,145.45	1,027.61	977.33	50.28	20.436	
9,300.00	6,341.69	8,264.81	5,326.16	87.75	88.81	7.29	-105.43	3,245.29	1,025.10	973.23	51.88	19.760	
9,400.00	6,344.23	8,364.78	5,331.23	90.47	91.53	7.31	-104.68	3,345.12	1,022.60	969.13	53.47	19.124	
9,500.00	6,346.77	8,464.75	5,336.29	93.19	94.26	7.32	-103.92	3,444.96	1,020.09	965.02	55.07	18.523	
9,600.00	6,349.31	8,564.72	5,341.35	95.91	96.99	7.34	-103.16	3,544.80	1,017.59	960.91	56.67	17.955	
9,700.00	6,351.85	8,664.69	5,346.42	98.64	99.72	7.36	-102.41	3,644.63	1,015.08	956.80	58.28	17.417	
9,800.00	6,354.39	8,764.65	5,351.48	101.37	102.45	7.38	-101.65	3,744.47	1,012.58	952.69	59.89	16.907	
9,900.00	6,356.93	8,864.62	5,356.54	104.09	105.18	7.40	-100.89	3,844.31	1,010.07	948.57	61.50	16.423	
10,000.00	6,359.47	8,964.59	5,361.61	106.82	107.91	7.42	-100.14	3,944.14	1,007.57	944.45	63.12	15.963	
10,100.00	6,362.01	9,064.56	5,366.67	109.55	110.65	7.43	-99.38	4,043.98	1,005.06	940.32	64.74	15.526	
10,200.00	6,364.55	9,164.53	5,371.74	112.28	113.38	7.45	-98.62	4,143.82	1,002.56	936.20	66.36	15.109	
10,300.00	6,367.09	9,264.49	5,376.80	115.02	116.12	7.47	-97.87	4,243.66	1,000.05	932.07	67.98	14.711	
10,400.00	6,369.63	9,364.46	5,381.86	117.75	118.85	7.49	-97.11	4,343.49	997.55	927.94	69.61	14.331	
10,500.00	6,372.17	9,464.43	5,386.93	120.49	121.59	7.51	-96.35	4,443.33	995.04	923.81	71.24	13.968	
10,600.00	6,374.71	9,564.40	5,391.99	123.22	124.33	7.53	-95.60	4,543.17	992.54	919.67	72.87	13.621	
10,700.00	6,377.25	9,664.37	5,397.05	125.96	127.06	7.55	-94.84	4,643.00	990.03	915.53	74.50	13.289	
10,782.95	6,379.36	9,722.54	5,400.00	128.23	128.66	7.56	-94.40	4,701.10	988.26	912.61	75.65	13.063	
10,808.13	6,380.00	9,722.54	5,400.00	128.92	128.66	7.56	-94.40	4,701.10	988.59	912.73	75.85	13.033	

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 11H - Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	179.65	-65.00	0.40	65.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.65	-65.00	0.40	65.00	64.78	0.22	289.195	
200.00	200.00	200.00	200.00	0.34	0.34	179.65	-65.00	0.40	65.00	64.33	0.67	96.398	
300.00	300.00	300.00	300.00	0.56	0.56	179.65	-65.00	0.40	65.00	63.88	1.12	57.839	
400.00	400.00	400.00	400.00	0.79	0.79	179.65	-65.00	0.40	65.00	63.43	1.57	41.314	
500.00	500.00	500.00	500.00	1.01	1.01	179.65	-65.00	0.40	65.00	62.98	2.02	32.133	
600.00	600.00	600.00	600.00	1.24	1.24	179.65	-65.00	0.40	65.00	62.53	2.47	26.290	
700.00	700.00	700.00	700.00	1.46	1.46	179.65	-65.00	0.40	65.00	62.08	2.92	22.246	
800.00	800.00	800.00	800.00	1.69	1.69	179.65	-65.00	0.40	65.00	61.63	3.37	19.280	
900.00	900.00	900.00	900.00	1.91	1.91	179.65	-65.00	0.40	65.00	61.18	3.82	17.011	
1,000.00	1,000.00	1,000.00	1,000.00	2.14	2.14	179.65	-65.00	0.40	65.00	60.73	4.27	15.221	
1,100.00	1,100.00	1,100.00	1,100.00	2.36	2.36	179.65	-65.00	0.40	65.00	60.28	4.72	13.771	
1,200.00	1,200.00	1,200.00	1,200.00	2.58	2.58	179.65	-65.00	0.40	65.00	59.83	5.17	12.574	
1,300.00	1,300.00	1,300.00	1,300.00	2.81	2.81	179.65	-65.00	0.40	65.00	59.38	5.62	11.568	
1,400.00	1,400.00	1,400.00	1,400.00	3.03	3.03	179.65	-65.00	0.40	65.00	58.93	6.07	10.711	
1,500.00	1,500.00	1,500.00	1,500.00	3.26	3.26	179.65	-65.00	0.40	65.00	58.48	6.52	9.972	
1,600.00	1,600.00	1,600.00	1,600.00	3.48	3.48	179.65	-65.00	0.40	65.00	58.03	6.97	9.329	
1,700.00	1,700.00	1,700.00	1,700.00	3.71	3.71	179.65	-65.00	0.40	65.00	57.58	7.42	8.763	
1,800.00	1,800.00	1,800.00	1,800.00	3.93	3.93	179.65	-65.00	0.40	65.00	57.13	7.87	8.263	
1,900.00	1,900.00	1,900.00	1,900.00	4.16	4.16	179.65	-65.00	0.40	65.00	56.68	8.32	7.816	
2,000.00	2,000.00	2,000.00	2,000.00	4.38	4.38	179.65	-65.00	0.40	65.00	56.24	8.77	7.415	
2,100.00	2,100.00	2,100.00	2,100.00	4.61	4.61	179.65	-65.00	0.40	65.00	55.79	9.22	7.054	
2,200.00	2,200.00	2,200.00	2,200.00	4.83	4.83	179.65	-65.00	0.40	65.00	55.34	9.66	6.725	
2,300.00	2,300.00	2,300.00	2,300.00	5.06	5.06	179.65	-65.00	0.40	65.00	54.89	10.11	6.427	
2,400.00	2,400.00	2,400.00	2,400.00	5.28	5.28	179.65	-65.00	0.40	65.00	54.44	10.56	6.153	
2,500.00	2,500.00	2,500.00	2,500.00	5.51	5.51	179.65	-65.00	0.40	65.00	53.99	11.01	5.902	
2,600.00	2,600.00	2,600.00	2,600.00	5.73	5.73	179.65	-65.00	0.40	65.00	53.54	11.46	5.670	
2,700.00	2,700.00	2,700.00	2,700.00	5.96	5.96	179.65	-65.00	0.40	65.00	53.09	11.91	5.457	
2,800.00	2,800.00	2,800.00	2,800.00	6.18	6.18	179.65	-65.00	0.40	65.00	52.64	12.36	5.258	
2,900.00	2,900.00	2,900.00	2,900.00	6.41	6.41	179.65	-65.00	0.40	65.00	52.19	12.81	5.074	
3,000.00	3,000.00	3,000.00	3,000.00	6.63	6.63	179.65	-65.00	0.40	65.00	51.74	13.26	4.902	
3,100.00	3,100.00	3,100.00	3,100.00	6.86	6.86	179.65	-65.00	0.40	65.00	51.29	13.71	4.741	
3,200.00	3,200.00	3,200.00	3,200.00	7.08	7.08	179.65	-65.00	0.40	65.00	50.84	14.16	4.590	
3,300.00	3,300.00	3,300.00	3,300.00	7.30	7.30	179.65	-65.00	0.40	65.00	50.39	14.61	4.449	
3,400.00	3,400.00	3,400.00	3,400.00	7.53	7.53	179.65	-65.00	0.40	65.00	49.94	15.06	4.316	
3,500.00	3,500.00	3,500.00	3,500.00	7.75	7.75	179.65	-65.00	0.40	65.00	49.49	15.51	4.191	
3,600.00	3,600.00	3,600.00	3,600.00	7.98	7.98	179.65	-65.00	0.40	65.00	49.04	15.96	4.073	
3,700.00	3,700.00	3,700.00	3,700.00	8.20	8.20	179.65	-65.00	0.40	65.00	48.59	16.41	3.962	
3,800.00	3,800.00	3,800.00	3,800.00	8.43	8.43	179.65	-65.00	0.40	65.00	48.14	16.86	3.856	
3,900.00	3,900.00	3,900.00	3,900.00	8.65	8.65	179.65	-65.00	0.40	65.00	47.69	17.31	3.756	
4,000.00	4,000.00	4,000.00	4,000.00	8.88	8.88	179.65	-65.00	0.40	65.00	47.24	17.76	3.661	
4,100.00	4,100.00	4,100.00	4,100.00	9.10	9.10	179.65	-65.00	0.40	65.00	46.80	18.21	3.570	
4,200.00	4,200.00	4,200.00	4,200.00	9.33	9.33	179.65	-65.00	0.40	65.00	46.35	18.66	3.484	
4,300.00	4,300.00	4,300.00	4,300.00	9.55	9.55	179.65	-65.00	0.40	65.00	45.90	19.11	3.402	
4,400.00	4,400.00	4,400.00	4,400.00	9.78	9.78	179.65	-65.00	0.40	65.00	45.45	19.55	3.324	
4,500.00	4,500.00	4,500.00	4,500.00	10.00	10.00	179.65	-65.00	0.40	65.00	45.00	20.00	3.249	
4,600.00	4,600.00	4,600.00	4,600.00	10.23	10.23	179.65	-65.00	0.40	65.00	44.55	20.45	3.178	
4,700.00	4,700.00	4,700.00	4,700.00	10.45	10.45	179.65	-65.00	0.40	65.00	44.10	20.90	3.110	
4,800.00	4,800.00	4,800.00	4,800.00	10.68	10.68	179.65	-65.00	0.40	65.00	43.65	21.35	3.044	
4,900.00	4,900.00	4,900.00	4,900.00	10.90	10.90	179.65	-65.00	0.40	65.00	43.20	21.80	2.981	
5,000.00	5,000.00	5,000.00	5,000.00	11.13	11.13	179.65	-65.00	0.40	65.00	42.75	22.25	2.921	
5,100.00	5,100.00	5,100.00	5,100.00	11.35	11.35	179.65	-65.00	0.40	65.00	42.30	22.70	2.863	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 11H - Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.00	5,200.00	5,200.00	5,200.00	11.58	11.58	179.65	-65.00	0.40	65.00	41.85	23.15	2.808	
5,300.00	5,300.00	5,300.00	5,300.00	11.80	11.80	179.65	-65.00	0.40	65.00	41.40	23.60	2.754	
5,400.00	5,400.00	5,400.00	5,400.00	12.02	12.02	179.65	-65.00	0.40	65.00	40.95	24.05	2.703	
5,446.36	5,446.36	5,446.36	5,446.36	12.13	12.13	179.57	-65.00	0.49	65.00	40.74	24.26	2.680 CC	
5,500.00	5,500.00	5,499.48	5,499.21	12.25	12.24	175.30	-64.96	5.34	65.19	40.70	24.49	2.662 ES, SF	
5,600.00	5,600.00	5,591.25	5,587.17	12.47	12.43	154.62	-64.77	30.73	72.83	47.92	24.91	2.924	
5,700.00	5,700.00	5,667.70	5,654.10	12.70	12.64	133.74	-64.50	67.39	103.96	78.65	25.31	4.107	
5,800.00	5,800.00	5,725.00	5,698.76	12.92	12.85	121.89	-64.23	103.22	158.21	132.48	25.73	6.149	
5,888.20	5,888.20	5,769.31	5,729.32	13.12	13.07	115.31	-63.99	135.28	218.26	192.13	26.13	8.352	
5,900.00	5,900.00	5,775.00	5,732.96	13.15	13.10	24.28	-63.95	139.64	226.80	200.83	25.97	8.733	
5,925.00	5,924.94	5,784.85	5,739.13	13.20	13.16	21.83	-63.90	147.33	244.54	218.58	25.96	9.421	
5,950.00	5,949.73	5,800.00	5,748.21	13.25	13.25	19.41	-63.81	159.45	261.81	235.94	25.87	10.122	
5,975.00	5,974.25	5,806.34	5,751.87	13.30	13.29	17.97	-63.77	164.63	278.38	252.71	25.67	10.843	
6,000.00	5,998.41	5,817.22	5,757.94	13.35	13.37	16.49	-63.70	173.65	294.41	269.00	25.40	11.589	
6,025.00	6,022.09	5,825.00	5,762.13	13.41	13.43	15.35	-63.65	180.21	309.81	284.77	25.04	12.371	
6,050.00	6,045.20	5,839.19	5,769.42	13.46	13.54	14.17	-63.56	192.39	324.49	299.88	24.61	13.185	
6,075.00	6,067.64	5,850.00	5,774.66	13.53	13.63	13.26	-63.49	201.84	338.50	314.40	24.09	14.049	
6,100.00	6,089.31	5,861.41	5,779.90	13.59	13.73	12.46	-63.41	211.98	351.79	328.28	23.50	14.968	
6,125.00	6,110.12	5,875.00	5,785.75	13.67	13.85	11.74	-63.32	224.24	364.35	341.50	22.85	15.947	
6,150.00	6,129.97	5,883.83	5,789.31	13.75	13.94	11.20	-63.26	232.32	376.12	354.00	22.12	17.003	
6,175.00	6,148.80	5,900.00	5,795.35	13.85	14.11	10.62	-63.15	247.32	387.20	365.84	21.35	18.133	
6,200.00	6,166.50	5,906.40	5,797.56	13.96	14.18	10.25	-63.10	253.32	397.36	376.84	20.52	19.362	
6,225.00	6,183.01	5,917.73	5,801.23	14.08	14.31	9.86	-63.02	264.04	406.78	387.11	19.66	20.686	
6,250.00	6,198.26	5,925.00	5,803.42	14.23	14.39	9.57	-62.97	270.97	415.42	396.65	18.78	22.126	
6,275.00	6,212.19	5,940.47	5,807.63	14.39	14.58	9.25	-62.86	285.86	423.16	405.26	17.89	23.648	
6,300.00	6,224.72	5,950.00	5,809.92	14.58	14.70	9.02	-62.79	295.11	430.10	413.10	17.01	25.289	
6,325.00	6,235.81	5,963.30	5,812.74	14.80	14.88	8.80	-62.69	308.10	436.19	420.03	16.16	26.999	
6,350.00	6,245.42	5,975.00	5,814.84	15.04	15.03	8.63	-62.60	319.61	441.43	426.08	15.35	28.760	
6,375.00	6,253.49	5,986.19	5,816.51	15.30	15.19	8.49	-62.52	330.67	445.81	431.19	14.61	30.507	
6,400.00	6,260.00	6,000.00	5,818.14	15.59	15.39	8.38	-62.42	344.39	449.34	435.35	13.98	32.130	
6,425.00	6,264.92	6,009.11	5,818.94	15.91	15.53	8.30	-62.35	353.47	451.97	438.50	13.47	33.552	
6,450.00	6,268.22	6,025.00	5,819.81	16.25	15.77	8.24	-62.23	369.33	453.79	440.66	13.13	34.563	
6,475.00	6,269.90	6,032.83	5,820.00	16.61	15.89	8.22	-62.17	377.16	454.64	441.70	12.94	35.143	
6,478.39	6,270.00	6,034.55	5,820.02	16.65	15.92	8.22	-62.16	378.88	454.69	441.76	12.93	35.173	
6,497.84	6,270.50	6,054.01	5,820.29	16.95	16.24	8.22	-62.01	398.34	454.91	441.86	13.06	34.838	
6,500.00	6,270.55	6,056.17	5,820.32	16.98	16.27	8.22	-62.00	400.49	454.94	441.87	13.07	34.800	
6,600.00	6,273.09	6,156.19	5,821.71	18.66	18.06	8.19	-61.24	500.50	456.08	442.25	13.83	32.968	
6,700.00	6,275.63	6,256.19	5,823.10	20.58	20.04	8.17	-60.48	600.48	457.22	442.49	14.73	31.035	
6,800.00	6,278.17	6,356.18	5,824.48	22.67	22.20	8.15	-59.72	700.47	458.36	442.61	15.75	29.101	
6,900.00	6,280.71	6,456.17	5,825.87	24.88	24.47	8.13	-58.97	800.45	459.51	442.64	16.87	27.245	
7,000.00	6,283.25	6,556.17	5,827.26	27.20	26.84	8.11	-58.21	900.43	460.65	442.59	18.06	25.508	
7,100.00	6,285.79	6,656.16	5,828.65	29.59	29.27	8.09	-57.45	1,000.41	461.79	442.47	19.32	23.907	
7,200.00	6,288.33	6,756.15	5,830.03	32.04	31.76	8.07	-56.69	1,100.39	462.93	442.30	20.63	22.445	
7,300.00	6,290.87	6,856.15	5,831.42	34.54	34.29	8.05	-55.93	1,200.37	464.07	442.10	21.98	21.117	
7,400.00	6,293.41	6,956.14	5,832.81	37.07	36.85	8.03	-55.18	1,300.35	465.21	441.85	23.36	19.914	
7,500.00	6,295.96	7,056.13	5,834.20	39.63	39.44	8.01	-54.42	1,400.33	466.36	441.58	24.78	18.823	
7,600.00	6,298.50	7,156.13	5,835.58	42.22	42.04	7.99	-53.66	1,500.31	467.50	441.28	26.21	17.835	
7,700.00	6,301.04	7,256.12	5,836.97	44.82	44.67	7.97	-52.90	1,600.29	468.64	440.97	27.67	16.937	
7,800.00	6,303.58	7,356.11	5,838.36	47.44	47.31	7.95	-52.15	1,700.27	469.78	440.64	29.14	16.120	
7,900.00	6,306.12	7,456.11	5,839.75	50.08	49.96	7.93	-51.39	1,800.25	470.92	440.29	30.63	15.374	
8,000.00	6,308.66	7,556.10	5,841.13	52.73	52.63	7.92	-50.63	1,900.24	472.07	439.94	32.13	14.693	
8,100.00	6,311.20	7,656.09	5,842.52	55.39	55.30	7.90	-49.87	2,000.22	473.21	439.57	33.64	14.068	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 11H - Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,200.00	6,313.74	7,756.09	5,843.91	58.06	57.98	7.88	-49.11	2,100.20	474.35	439.19	35.16	13.493	
8,300.00	6,316.28	7,856.08	5,845.30	60.73	60.67	7.86	-48.36	2,200.18	475.49	438.81	36.68	12.963	
8,400.00	6,318.82	7,956.07	5,846.68	63.41	63.36	7.84	-47.60	2,300.16	476.63	438.42	38.21	12.474	
8,500.00	6,321.36	8,056.07	5,848.07	66.10	66.06	7.82	-46.84	2,400.14	477.78	438.03	39.75	12.021	
8,600.00	6,323.90	8,156.06	5,849.46	68.79	68.76	7.80	-46.08	2,500.12	478.92	437.63	41.29	11.600	
8,700.00	6,326.44	8,256.05	5,850.85	71.49	71.46	7.78	-45.32	2,600.10	480.06	437.23	42.83	11.208	
8,800.00	6,328.98	8,356.05	5,852.23	74.19	74.17	7.76	-44.57	2,700.08	481.20	436.82	44.38	10.843	
8,900.00	6,331.52	8,456.04	5,853.62	76.90	76.89	7.75	-43.81	2,800.06	482.35	436.42	45.93	10.502	
9,000.00	6,334.06	8,556.03	5,855.01	79.61	79.60	7.73	-43.05	2,900.04	483.49	436.01	47.48	10.182	
9,100.00	6,336.60	8,656.03	5,856.40	82.32	82.32	7.71	-42.29	3,000.02	484.63	435.59	49.04	9.882	
9,200.00	6,339.14	8,756.02	5,857.78	85.03	85.04	7.69	-41.53	3,100.01	485.78	435.18	50.60	9.601	
9,300.00	6,341.69	8,856.02	5,859.17	87.75	87.76	7.67	-40.78	3,199.99	486.92	434.76	52.16	9.336	
9,400.00	6,344.23	8,956.01	5,860.56	90.47	90.49	7.65	-40.02	3,299.97	488.06	434.34	53.72	9.086	
9,500.00	6,346.77	9,056.00	5,861.95	93.19	93.21	7.64	-39.26	3,399.95	489.20	433.93	55.28	8.850	
9,600.00	6,349.31	9,156.00	5,863.33	95.91	95.94	7.62	-38.50	3,499.93	490.35	433.51	56.84	8.627	
9,700.00	6,351.85	9,255.99	5,864.72	98.64	98.67	7.60	-37.75	3,599.91	491.49	433.09	58.40	8.415	
9,800.00	6,354.39	9,355.98	5,866.11	101.37	101.40	7.58	-36.99	3,699.89	492.63	432.66	59.97	8.215	
9,900.00	6,356.93	9,455.98	5,867.50	104.09	104.13	7.56	-36.23	3,799.87	493.78	432.24	61.53	8.025	
10,000.00	6,359.47	9,555.97	5,868.88	106.82	106.87	7.55	-35.47	3,899.85	494.92	431.82	63.10	7.844	
10,100.00	6,362.01	9,655.96	5,870.27	109.55	109.60	7.53	-34.71	3,999.83	496.06	431.40	64.66	7.672	
10,200.00	6,364.55	9,755.96	5,871.66	112.28	112.34	7.51	-33.96	4,099.81	497.21	430.98	66.23	7.508	
10,300.00	6,367.09	9,855.95	5,873.05	115.02	115.07	7.50	-33.20	4,199.80	498.35	430.56	67.79	7.351	
10,400.00	6,369.63	9,955.94	5,874.43	117.75	117.81	7.48	-32.44	4,299.78	499.49	430.13	69.36	7.202	
10,500.00	6,372.17	10,055.94	5,875.82	120.49	120.55	7.46	-31.68	4,399.76	500.64	429.71	70.92	7.059	
10,600.00	6,374.71	10,155.93	5,877.21	123.22	123.28	7.44	-30.92	4,499.74	501.78	429.29	72.49	6.922	
10,700.00	6,377.25	10,255.92	5,878.60	125.96	126.02	7.43	-30.17	4,599.72	502.92	428.87	74.05	6.791	
10,808.13	6,380.00	10,357.45	5,880.01	128.92	128.80	7.41	-29.40	4,701.23	504.20	428.49	75.71	6.660	

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	179.67	-155.00	0.90	155.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.67	-155.00	0.90	155.00	154.78	0.22	689.618	
200.00	200.00	200.00	200.00	0.34	0.34	179.67	-155.00	0.90	155.00	154.33	0.67	229.873	CC
223.90	223.90	223.89	223.89	0.39	0.39	179.70	-155.00	0.80	155.00	154.22	0.78	198.839	
300.00	300.00	299.96	299.94	0.56	0.55	-179.69	-155.01	-0.84	155.01	153.90	1.11	139.072	
400.00	400.00	399.67	399.51	0.79	0.78	-177.77	-155.04	-6.05	155.16	153.60	1.56	99.318	
500.00	500.00	499.42	499.02	1.01	1.01	-175.21	-155.09	-13.01	155.64	153.63	2.01	77.435	
600.00	600.00	599.18	598.53	1.24	1.26	-172.67	-155.13	-19.97	156.42	153.97	2.46	63.700	
700.00	700.00	698.94	698.05	1.46	1.51	-170.16	-155.18	-26.93	157.51	154.61	2.91	54.214	
800.00	800.00	798.69	797.56	1.69	1.76	-167.69	-155.22	-33.88	158.90	155.54	3.36	47.316	
900.00	900.00	898.45	897.07	1.91	2.01	-165.26	-155.27	-40.84	160.58	156.76	3.81	42.103	
1,000.00	1,000.00	999.46	997.91	2.14	2.24	-163.30	-155.31	-46.60	162.16	157.91	4.25	38.180	
1,100.00	1,100.00	1,100.72	1,099.12	2.36	2.43	-162.26	-155.33	-49.69	163.08	158.42	4.66	35.005	
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-162.07	-155.33	-50.26	163.26	158.18	5.08	32.135	
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-162.07	-155.33	-50.26	163.26	157.75	5.51	29.613	
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-162.07	-155.33	-50.26	163.26	157.31	5.95	27.447	
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-162.07	-155.33	-50.26	163.26	156.87	6.39	25.568	
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-162.07	-155.33	-50.26	163.26	156.43	6.82	23.924	
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-162.07	-155.33	-50.26	163.26	155.99	7.26	22.475	
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.86	-162.07	-155.33	-50.26	163.26	155.55	7.71	21.188	
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-162.07	-155.33	-50.26	163.26	155.11	8.15	20.038	
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-162.07	-155.33	-50.26	163.26	154.67	8.59	19.005	
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-162.07	-155.33	-50.26	163.26	154.22	9.03	18.072	
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-162.07	-155.33	-50.26	163.26	153.78	9.48	17.225	
2,300.00	2,300.00	2,301.60	2,300.00	5.06	4.94	-162.07	-155.33	-50.26	163.26	153.34	9.92	16.453	
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-162.07	-155.33	-50.26	163.26	152.89	10.37	15.747	
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-162.07	-155.33	-50.26	163.26	152.45	10.81	15.098	
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-162.07	-155.33	-50.26	163.26	152.00	11.26	14.501	
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-162.07	-155.33	-50.26	163.26	151.55	11.70	13.948	
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-162.07	-155.33	-50.26	163.26	151.11	12.15	13.436	
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.26	-162.07	-155.33	-50.26	163.26	150.66	12.60	12.959	
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-162.07	-155.33	-50.26	163.26	150.21	13.04	12.516	
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-162.07	-155.33	-50.26	163.26	149.77	13.49	12.101	
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-162.07	-155.33	-50.26	163.26	149.32	13.94	11.713	
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-162.07	-155.33	-50.26	163.26	148.87	14.39	11.349	
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-162.07	-155.33	-50.26	163.26	148.43	14.83	11.006	
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.58	-162.07	-155.33	-50.26	163.26	147.98	15.28	10.684	
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-162.07	-155.33	-50.26	163.26	147.53	15.73	10.380	
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-162.07	-155.33	-50.26	163.26	147.08	16.18	10.093	
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-162.07	-155.33	-50.26	163.26	146.63	16.62	9.821	
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-162.07	-155.33	-50.26	163.26	146.19	17.07	9.563	
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-162.07	-155.33	-50.26	163.26	145.74	17.52	9.319	
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-162.07	-155.33	-50.26	163.26	145.29	17.97	9.086	
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-162.07	-155.33	-50.26	163.26	144.84	18.42	8.865	
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-162.07	-155.33	-50.26	163.26	144.39	18.86	8.654	
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-162.07	-155.33	-50.26	163.26	143.95	19.31	8.453	
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-162.07	-155.33	-50.26	163.26	143.50	19.76	8.262	
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-162.07	-155.33	-50.26	163.26	143.05	20.21	8.078	
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-162.07	-155.33	-50.26	163.26	142.60	20.66	7.903	
4,766.09	4,766.09	4,767.69	4,766.09	10.60	10.40	-162.07	-155.33	-50.26	163.26	142.30	20.95	7.791	
4,800.00	4,800.00	4,801.40	4,799.80	10.68	10.48	-162.07	-155.33	-50.26	163.26	142.15	21.11	7.735	ES, SF
4,900.00	4,900.00	4,887.97	4,885.59	10.90	10.67	-158.77	-155.40	-60.37	167.33	145.81	21.52	7.774	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	5,000.00	4,966.33	4,959.52	11.13	10.89	-151.08	-155.56	-85.95	182.28	160.33	21.95	8.305	
5,100.00	5,100.00	5,032.25	5,016.58	11.35	11.14	-142.67	-155.77	-118.78	212.91	190.54	22.37	9.517	
5,200.00	5,200.00	5,085.47	5,058.00	11.58	11.40	-135.72	-155.99	-152.13	260.08	237.27	22.81	11.403	
5,300.00	5,300.00	5,125.00	5,085.54	11.80	11.64	-130.87	-156.17	-180.46	320.85	297.62	23.24	13.808	
5,400.00	5,400.00	5,161.52	5,108.27	12.02	11.92	-126.80	-156.36	-209.03	391.47	367.77	23.70	16.516	
5,500.00	5,500.00	5,188.60	5,123.30	12.25	12.16	-124.05	-156.50	-231.56	469.06	444.91	24.14	19.428	
5,600.00	5,600.00	5,210.63	5,134.32	12.47	12.38	-122.00	-156.62	-250.62	551.54	526.97	24.57	22.449	
5,700.00	5,700.00	5,225.00	5,140.91	12.70	12.53	-120.75	-156.71	-263.39	637.58	612.64	24.93	25.570	
5,800.00	5,800.00	5,250.00	5,151.22	12.92	12.82	-118.73	-156.85	-286.16	726.22	700.79	25.43	28.554	
5,888.20	5,888.20	5,250.00	5,151.22	13.12	12.82	-118.73	-156.85	-286.16	805.99	780.36	25.63	31.445	
5,900.00	5,900.00	5,250.00	5,151.22	13.15	12.82	149.65	-156.85	-286.16	816.86	791.99	24.87	32.844	
5,925.00	5,924.94	5,259.13	5,154.61	13.20	12.94	145.14	-156.91	-294.63	840.17	815.16	25.01	33.594	
5,950.00	5,949.73	5,260.96	5,155.27	13.25	12.96	137.79	-156.92	-296.35	864.07	838.88	25.19	34.303	
5,975.00	5,974.25	5,262.24	5,155.72	13.30	12.98	126.91	-156.93	-297.54	888.32	862.81	25.52	34.812	
6,000.00	5,998.41	5,262.99	5,155.98	13.35	12.99	110.92	-156.93	-298.24	912.83	886.79	26.04	35.061	
6,025.00	6,022.09	5,263.23	5,156.07	13.41	12.99	89.89	-156.93	-298.47	937.46	911.06	26.40	35.514	
6,050.00	6,045.20	5,262.99	5,155.98	13.46	12.99	68.22	-156.93	-298.24	962.10	936.12	25.98	37.030	
6,075.00	6,067.64	5,262.30	5,155.74	13.53	12.98	51.02	-156.93	-297.60	986.67	961.74	24.93	39.584	
6,100.00	6,089.31	5,261.19	5,155.35	13.59	12.96	39.15	-156.92	-296.56	1,011.05	987.30	23.74	42.580	
6,125.00	6,110.12	5,259.68	5,154.81	13.67	12.95	31.14	-156.91	-295.15	1,035.15	1,012.51	22.63	45.737	
6,150.00	6,129.97	5,250.00	5,151.22	13.75	12.82	25.09	-156.85	-286.16	1,058.99	1,037.47	21.52	49.202	
6,175.00	6,148.80	5,250.00	5,151.22	13.85	12.82	21.36	-156.85	-286.16	1,082.23	1,061.67	20.56	52.650	
6,200.00	6,166.50	5,250.00	5,151.22	13.96	12.82	18.57	-156.85	-286.16	1,104.96	1,085.36	19.59	56.392	
6,225.00	6,183.01	5,250.00	5,151.22	14.08	12.82	16.41	-156.85	-286.16	1,127.12	1,108.48	18.63	60.486	
6,250.00	6,198.26	5,250.00	5,151.22	14.23	12.82	14.70	-156.85	-286.16	1,148.64	1,130.96	17.68	64.981	
6,275.00	6,212.19	5,250.00	5,151.22	14.39	12.82	13.33	-156.85	-286.16	1,169.48	1,152.75	16.73	69.912	
6,300.00	6,224.72	5,239.99	5,147.28	14.58	12.70	12.08	-156.79	-276.96	1,189.41	1,173.63	15.78	75.360	
6,325.00	6,235.81	5,236.14	5,145.69	14.80	12.66	11.14	-156.77	-273.45	1,208.57	1,193.68	14.89	81.171	
6,350.00	6,245.42	5,225.00	5,140.91	15.04	12.53	10.29	-156.71	-263.39	1,226.92	1,212.88	14.04	87.372	
6,375.00	6,253.49	5,225.00	5,140.91	15.30	12.53	9.67	-156.71	-263.39	1,244.19	1,230.90	13.29	93.615	
6,400.00	6,260.00	5,225.00	5,140.91	15.59	12.53	9.14	-156.71	-263.39	1,260.53	1,247.88	12.64	99.701	
6,425.00	6,264.92	5,225.00	5,140.91	15.91	12.53	8.69	-156.71	-263.39	1,275.92	1,263.79	12.13	105.197	
6,450.00	6,268.22	5,214.11	5,135.97	16.25	12.42	8.25	-156.64	-253.69	1,290.12	1,278.36	11.76	109.688	
6,475.00	6,269.90	5,200.00	5,129.14	16.61	12.27	7.87	-156.56	-241.34	1,303.45	1,291.88	11.57	112.685	
6,478.39	6,270.00	5,200.00	5,129.14	16.65	12.27	7.83	-156.56	-241.34	1,305.13	1,293.57	11.56	112.925	
6,497.84	6,270.50	5,200.00	5,129.14	16.95	12.27	7.83	-156.56	-241.34	1,314.83	1,303.21	11.62	113.187	
6,500.00	6,270.55	5,200.00	5,129.14	16.98	12.27	7.83	-156.56	-241.34	1,315.92	1,304.30	11.62	113.215	
6,600.00	6,273.09	5,185.53	5,121.67	18.66	12.13	7.78	-156.48	-228.95	1,368.84	1,356.87	11.96	114.435	
6,700.00	6,275.63	5,175.00	5,115.95	20.58	12.03	7.74	-156.43	-220.11	1,425.85	1,413.48	12.37	115.228	
6,800.00	6,278.17	5,150.00	5,101.40	22.67	11.82	7.64	-156.30	-199.79	1,486.33	1,473.50	12.83	115.822	
6,900.00	6,280.71	5,135.79	5,092.54	24.88	11.72	7.58	-156.22	-188.68	1,550.16	1,536.81	13.35	116.098	
7,000.00	6,283.25	5,125.00	5,085.54	27.20	11.64	7.54	-156.17	-180.46	1,616.99	1,603.08	13.91	116.218	
7,100.00	6,285.79	5,100.00	5,068.46	29.59	11.48	7.43	-156.05	-162.21	1,686.56	1,672.06	14.49	116.359	
7,200.00	6,288.33	5,100.00	5,068.46	32.04	11.48	7.43	-156.05	-162.21	1,758.40	1,743.28	15.13	116.255	
7,300.00	6,290.87	5,075.00	5,050.23	34.54	11.34	7.31	-155.94	-145.12	1,832.57	1,816.82	15.75	116.335	
7,400.00	6,293.41	5,075.00	5,050.23	37.07	11.34	7.31	-155.94	-145.12	1,908.54	1,892.11	16.42	116.206	
7,500.00	6,295.96	5,062.20	5,040.46	39.63	11.27	7.25	-155.89	-136.84	1,986.37	1,969.28	17.10	116.193	
7,600.00	6,298.50	5,050.00	5,030.91	42.22	11.21	7.20	-155.84	-129.26	2,065.84	2,048.07	17.78	116.198	
7,700.00	6,301.04	5,050.00	5,030.91	44.82	11.21	7.20	-155.84	-129.26	2,146.82	2,128.33	18.49	116.115	
7,800.00	6,303.58	5,025.00	5,010.60	47.44	11.10	7.08	-155.75	-114.69	2,229.16	2,209.99	19.17	116.280	
7,900.00	6,306.12	5,025.00	5,010.60	50.08	11.10	7.08	-155.75	-114.69	2,312.45	2,292.56	19.90	116.224	
8,000.00	6,308.66	5,025.00	5,010.60	52.73	11.10	7.08	-155.75	-114.69	2,397.03	2,376.40	20.63	116.194	

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

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,100.00	6,311.20	5,012.84	5,000.38	55.39	11.06	7.02	-155.70	-108.09	2,482.53	2,461.18	21.35	116.296	
8,200.00	6,313.74	5,000.00	4,989.37	58.06	11.01	6.96	-155.66	-101.49	2,569.03	2,546.97	22.07	116.425	
8,300.00	6,316.28	5,000.00	4,989.37	60.73	11.01	6.96	-155.66	-101.49	2,656.26	2,633.44	22.81	116.434	
8,400.00	6,318.82	5,000.00	4,989.37	63.41	11.01	6.96	-155.66	-101.49	2,744.35	2,720.79	23.57	116.458	
8,500.00	6,321.36	4,988.68	4,979.49	66.10	10.97	6.91	-155.63	-95.97	2,833.05	2,808.75	24.30	116.610	
8,600.00	6,323.90	4,975.00	4,967.33	68.79	10.92	6.84	-155.59	-89.70	2,922.54	2,897.52	25.02	116.803	
8,700.00	6,326.44	4,975.00	4,967.33	71.49	10.92	6.84	-155.59	-89.70	3,012.44	2,986.66	25.78	116.849	
8,800.00	6,328.98	4,975.00	4,967.33	74.19	10.92	6.84	-155.59	-89.70	3,102.95	3,076.41	26.54	116.903	
8,900.00	6,331.52	4,975.00	4,967.33	76.90	10.92	6.84	-155.59	-89.70	3,194.03	3,166.72	27.31	116.965	
9,000.00	6,334.06	4,975.00	4,967.33	79.61	10.92	6.84	-155.59	-89.70	3,285.63	3,257.55	28.07	117.033	
9,100.00	6,336.60	4,950.00	4,944.57	82.32	10.84	6.73	-155.52	-79.37	3,377.60	3,348.83	28.77	117.392	
9,200.00	6,339.14	4,950.00	4,944.57	85.03	10.84	6.73	-155.52	-79.37	3,469.84	3,440.30	29.54	117.461	
9,300.00	6,341.69	4,950.00	4,944.57	87.75	10.84	6.73	-155.52	-79.37	3,562.49	3,532.18	30.31	117.534	
9,400.00	6,344.23	4,950.00	4,944.57	90.47	10.84	6.73	-155.52	-79.37	3,655.53	3,624.45	31.08	117.611	
9,500.00	6,346.77	4,950.00	4,944.57	93.19	10.84	6.73	-155.52	-79.37	3,748.93	3,717.08	31.85	117.689	
9,600.00	6,349.31	4,950.00	4,944.57	95.91	10.84	6.73	-155.52	-79.37	3,842.66	3,810.04	32.63	117.770	
9,700.00	6,351.85	4,950.00	4,944.57	98.64	10.84	6.73	-155.52	-79.37	3,936.70	3,903.30	33.40	117.853	
9,800.00	6,354.39	4,937.65	4,933.08	101.37	10.81	6.67	-155.49	-74.83	4,030.81	3,996.68	34.14	118.081	
9,900.00	6,356.93	4,925.00	4,921.18	104.09	10.77	6.61	-155.46	-70.56	4,125.44	4,090.57	34.87	118.319	
10,000.00	6,359.47	4,925.00	4,921.18	106.82	10.77	6.61	-155.46	-70.56	4,220.09	4,184.45	35.64	118.399	
10,100.00	6,362.01	4,925.00	4,921.18	109.55	10.77	6.61	-155.46	-70.56	4,314.99	4,278.57	36.42	118.479	
10,200.00	6,364.55	4,925.00	4,921.18	112.28	10.77	6.61	-155.46	-70.56	4,410.11	4,372.91	37.20	118.560	
10,300.00	6,367.09	4,925.00	4,921.18	115.02	10.77	6.61	-155.46	-70.56	4,505.44	4,467.46	37.98	118.640	
10,400.00	6,369.63	4,925.00	4,921.18	117.75	10.77	6.61	-155.46	-70.56	4,600.97	4,562.21	38.75	118.721	
10,500.00	6,372.17	4,925.00	4,921.18	120.49	10.77	6.61	-155.46	-70.56	4,696.68	4,657.15	39.53	118.801	
10,600.00	6,374.71	4,925.00	4,921.18	123.22	10.77	6.61	-155.46	-70.56	4,792.57	4,752.26	40.31	118.881	
10,700.00	6,377.25	4,925.00	4,921.18	125.96	10.77	6.61	-155.46	-70.56	4,888.63	4,847.53	41.09	118.960	
10,808.13	6,380.00	4,925.00	4,921.18	128.92	10.77	6.61	-155.46	-70.56	4,992.67	4,950.73	41.94	119.045	

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow federal 14H - Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	179.68	-90.00	0.50	90.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.68	-90.00	0.50	90.00	89.78	0.22	400.423	
200.00	200.00	200.00	200.00	0.34	0.34	179.68	-90.00	0.50	90.00	89.33	0.67	133.474	CC
224.65	224.65	224.65	224.65	0.39	0.39	179.75	-90.00	0.39	90.00	89.22	0.78	114.967	
300.00	300.00	299.96	299.94	0.56	0.55	-179.21	-90.01	-1.24	90.02	88.91	1.11	80.762	
400.00	400.00	399.67	399.51	0.79	0.78	-175.90	-90.04	-6.45	90.28	88.71	1.56	57.784	
500.00	500.00	499.43	499.02	1.01	1.01	-171.53	-90.09	-13.41	91.09	89.08	2.01	45.309	
600.00	600.00	599.18	598.54	1.24	1.26	-167.27	-90.13	-20.37	92.42	89.96	2.46	37.605	
700.00	700.00	698.94	698.05	1.46	1.51	-163.14	-90.18	-27.33	94.25	91.34	2.91	32.384	
800.00	800.00	798.70	797.56	1.69	1.76	-159.19	-90.22	-34.28	96.55	93.18	3.37	28.667	
900.00	900.00	898.45	897.08	1.91	2.01	-155.45	-90.27	-41.24	99.29	95.46	3.83	25.923	
1,000.00	1,000.00	999.46	997.91	2.14	2.24	-152.51	-90.31	-47.00	101.83	97.56	4.27	23.853	
1,100.00	1,100.00	1,100.72	1,099.13	2.36	2.43	-150.99	-90.33	-50.09	103.29	98.61	4.68	22.060	
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-150.72	-90.33	-50.66	103.57	98.46	5.10	20.297	
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-150.72	-90.33	-50.66	103.57	98.03	5.53	18.716	
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-150.72	-90.33	-50.66	103.57	97.60	5.97	17.355	
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-150.72	-90.33	-50.66	103.57	97.16	6.40	16.173	
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-150.72	-90.33	-50.66	103.57	96.72	6.84	15.138	
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-150.72	-90.33	-50.66	103.57	96.28	7.28	14.225	
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.86	-150.72	-90.33	-50.66	103.57	95.84	7.72	13.413	
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-150.72	-90.33	-50.66	103.57	95.40	8.16	12.688	
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-150.72	-90.33	-50.66	103.57	94.96	8.60	12.036	
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-150.72	-90.33	-50.66	103.57	94.52	9.05	11.447	
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-150.72	-90.33	-50.66	103.57	94.07	9.49	10.912	
2,300.00	2,300.00	2,301.60	2,300.00	5.06	4.94	-150.72	-90.33	-50.66	103.57	93.63	9.94	10.424	
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-150.72	-90.33	-50.66	103.57	93.19	10.38	9.977	
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-150.72	-90.33	-50.66	103.57	92.74	10.83	9.567	
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-150.72	-90.33	-50.66	103.57	92.29	11.27	9.189	
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-150.72	-90.33	-50.66	103.57	91.85	11.72	8.839	
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-150.72	-90.33	-50.66	103.57	91.40	12.16	8.515	
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.26	-150.72	-90.33	-50.66	103.57	90.96	12.61	8.214	
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-150.72	-90.33	-50.66	103.57	90.51	13.05	7.933	
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-150.72	-90.33	-50.66	103.57	90.06	13.50	7.671	
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-150.72	-90.33	-50.66	103.57	89.62	13.95	7.425	
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-150.72	-90.33	-50.66	103.57	89.17	14.40	7.194	
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-150.72	-90.33	-50.66	103.57	88.72	14.84	6.978	
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.58	-150.72	-90.33	-50.66	103.57	88.28	15.29	6.773	
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-150.72	-90.33	-50.66	103.57	87.83	15.74	6.581	
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-150.72	-90.33	-50.66	103.57	87.38	16.19	6.399	
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-150.72	-90.33	-50.66	103.57	86.93	16.63	6.227	
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-150.72	-90.33	-50.66	103.57	86.48	17.08	6.063	
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-150.72	-90.33	-50.66	103.57	86.04	17.53	5.908	
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-150.72	-90.33	-50.66	103.57	85.59	17.98	5.761	
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-150.72	-90.33	-50.66	103.57	85.14	18.42	5.621	
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-150.72	-90.33	-50.66	103.57	84.69	18.87	5.488	
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-150.72	-90.33	-50.66	103.57	84.24	19.32	5.360	
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-150.72	-90.33	-50.66	103.57	83.80	19.77	5.239	
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-150.72	-90.33	-50.66	103.57	83.35	20.22	5.123	
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-150.72	-90.33	-50.66	103.57	82.90	20.67	5.011	
4,800.00	4,800.00	4,801.60	4,800.00	10.68	10.48	-150.72	-90.33	-50.66	103.57	82.45	21.11	4.905	
4,900.00	4,900.00	4,901.60	4,900.00	10.90	10.70	-150.72	-90.33	-50.66	103.57	82.00	21.56	4.803	
5,000.00	5,000.00	5,001.60	5,000.00	11.13	10.92	-150.72	-90.33	-50.66	103.57	81.55	22.01	4.705	

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

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow federal 14H - Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,100.00	5,101.60	5,100.00	11.35	11.15	-150.72	-90.33	-50.66	103.57	81.11	22.46	4.611	
5,200.00	5,200.00	5,201.60	5,200.00	11.58	11.37	-150.72	-90.33	-50.66	103.57	80.66	22.91	4.521	
5,300.00	5,300.00	5,301.60	5,300.00	11.80	11.59	-150.72	-90.33	-50.66	103.57	80.21	23.36	4.434	
5,400.00	5,400.00	5,401.60	5,400.00	12.02	11.82	-150.72	-90.33	-50.66	103.57	79.76	23.81	4.351	ES, SF
5,500.00	5,500.00	5,488.77	5,486.50	12.25	12.01	-146.49	-90.39	-59.85	109.25	85.02	24.22	4.510	
5,600.00	5,600.00	5,567.67	5,561.19	12.47	12.23	-136.86	-90.55	-84.86	130.03	105.38	24.65	5.274	
5,700.00	5,700.00	5,634.24	5,619.09	12.70	12.45	-127.68	-90.76	-117.52	169.10	144.01	25.09	6.739	
5,800.00	5,800.00	5,688.05	5,661.20	12.92	12.70	-121.08	-90.98	-150.95	224.34	198.80	25.54	8.783	
5,888.20	5,888.20	5,725.00	5,687.20	13.12	12.90	-117.22	-91.15	-177.19	283.03	257.09	25.94	10.911	
5,900.00	5,900.00	5,730.80	5,691.04	13.15	12.94	152.94	-91.18	-181.53	291.54	265.82	25.71	11.338	
5,925.00	5,924.94	5,739.34	5,696.59	13.20	13.00	151.82	-91.22	-188.03	310.63	284.91	25.72	12.076	
5,950.00	5,949.73	5,750.00	5,703.30	13.25	13.07	150.64	-91.27	-196.31	331.04	305.36	25.68	12.893	
5,975.00	5,974.25	5,750.00	5,703.30	13.30	13.07	147.41	-91.27	-196.31	352.49	326.91	25.58	13.780	
6,000.00	5,998.41	5,757.75	5,708.03	13.35	13.13	144.58	-91.31	-202.44	374.84	349.37	25.48	14.713	
6,025.00	6,022.09	5,761.67	5,710.37	13.41	13.16	139.89	-91.33	-205.58	397.95	372.53	25.42	15.658	
6,050.00	6,045.20	5,764.59	5,712.10	13.46	13.18	133.10	-91.35	-207.94	421.62	396.14	25.49	16.542	
6,075.00	6,067.64	5,766.60	5,713.28	13.53	13.19	123.15	-91.36	-209.56	445.73	419.91	25.82	17.264	
6,100.00	6,089.31	5,767.75	5,713.95	13.59	13.20	108.78	-91.36	-210.50	470.11	443.68	26.43	17.789	
6,125.00	6,110.12	5,775.00	5,718.11	13.67	13.26	94.32	-91.40	-216.44	494.77	467.86	26.90	18.392	
6,150.00	6,129.97	5,767.76	5,713.95	13.75	13.20	69.77	-91.36	-210.51	519.24	492.91	26.34	19.716	
6,175.00	6,148.80	5,766.75	5,713.36	13.85	13.19	52.77	-91.36	-209.69	543.77	518.91	24.85	21.881	
6,200.00	6,166.50	5,765.13	5,712.42	13.96	13.18	40.46	-91.35	-208.37	568.13	545.01	23.11	24.580	
6,225.00	6,183.01	5,762.96	5,711.14	14.08	13.17	31.94	-91.34	-206.62	592.23	570.74	21.50	27.551	
6,250.00	6,198.26	5,760.28	5,709.55	14.23	13.15	25.99	-91.32	-204.47	616.00	595.95	20.05	30.719	
6,275.00	6,212.19	5,750.00	5,703.30	14.39	13.07	21.14	-91.27	-196.31	639.47	620.81	18.66	34.267	
6,300.00	6,224.72	5,750.00	5,703.30	14.58	13.07	18.33	-91.27	-196.31	662.26	644.73	17.53	37.772	
6,325.00	6,235.81	5,750.00	5,703.30	14.80	13.07	16.13	-91.27	-196.31	684.56	668.08	16.48	41.533	
6,350.00	6,245.42	5,750.00	5,703.30	15.04	13.07	14.39	-91.27	-196.31	706.33	690.81	15.52	45.523	
6,375.00	6,253.49	5,740.74	5,697.48	15.30	13.01	12.73	-91.22	-189.10	727.34	712.73	14.61	49.790	
6,400.00	6,260.00	5,735.83	5,694.33	15.59	12.97	11.52	-91.20	-185.34	747.68	733.83	13.85	53.982	
6,425.00	6,264.92	5,725.00	5,687.20	15.91	12.90	10.43	-91.15	-177.19	767.33	754.10	13.22	58.024	
6,450.00	6,268.22	5,725.00	5,687.20	16.25	12.90	9.69	-91.15	-177.19	786.04	773.24	12.80	61.424	
6,475.00	6,269.90	5,725.00	5,687.20	16.61	12.90	9.05	-91.15	-177.19	804.02	791.47	12.55	64.047	
6,478.39	6,270.00	5,725.00	5,687.20	16.65	12.90	8.98	-91.15	-177.19	806.41	793.87	12.54	64.330	
6,497.84	6,270.50	5,714.38	5,679.99	16.95	12.84	8.86	-91.10	-169.39	819.93	807.35	12.58	65.194	
6,500.00	6,270.55	5,713.89	5,679.65	16.98	12.84	8.85	-91.09	-169.04	821.45	808.86	12.58	65.282	
6,600.00	6,273.09	5,700.00	5,669.88	18.66	12.76	8.71	-91.03	-159.16	893.94	881.01	12.92	69.166	
6,700.00	6,275.63	5,675.00	5,651.43	20.58	12.63	8.44	-90.92	-142.30	969.77	956.46	13.31	72.847	
6,800.00	6,278.17	5,650.00	5,631.91	22.67	12.52	8.18	-90.82	-126.69	1,048.76	1,035.00	13.75	76.249	
6,900.00	6,280.71	5,650.00	5,631.91	24.88	12.52	8.18	-90.82	-126.69	1,130.19	1,115.90	14.30	79.053	
7,000.00	6,283.25	5,625.00	5,611.41	27.20	12.42	7.92	-90.73	-112.39	1,213.63	1,198.82	14.82	81.908	
7,100.00	6,285.79	5,625.00	5,611.41	29.59	12.42	7.92	-90.73	-112.39	1,299.07	1,283.64	15.43	84.193	
7,200.00	6,288.33	5,600.00	5,590.02	32.04	12.33	7.66	-90.65	-99.46	1,385.88	1,369.88	16.00	86.624	
7,300.00	6,290.87	5,600.00	5,590.02	34.54	12.33	7.66	-90.65	-99.46	1,474.07	1,457.41	16.66	88.493	
7,400.00	6,293.41	5,586.62	5,578.24	37.07	12.28	7.53	-90.60	-93.12	1,563.39	1,546.10	17.29	90.410	
7,500.00	6,295.96	5,575.00	5,567.83	39.63	12.25	7.42	-90.57	-87.95	1,653.75	1,635.81	17.94	92.157	
7,600.00	6,298.50	5,575.00	5,567.83	42.22	12.25	7.42	-90.57	-87.95	1,744.97	1,726.32	18.65	93.575	
7,700.00	6,301.04	5,564.10	5,557.92	44.82	12.21	7.31	-90.54	-83.40	1,836.91	1,817.59	19.32	95.072	
7,800.00	6,303.58	5,550.00	5,544.93	47.44	12.17	7.18	-90.51	-77.92	1,929.65	1,909.66	19.99	96.533	
7,900.00	6,306.12	5,550.00	5,544.93	50.08	12.17	7.18	-90.51	-77.92	2,022.79	2,002.07	20.72	97.638	
8,000.00	6,308.66	5,550.00	5,544.93	52.73	12.17	7.18	-90.51	-77.92	2,116.56	2,095.11	21.45	98.663	
8,100.00	6,311.20	5,550.00	5,544.93	55.39	12.17	7.18	-90.51	-77.92	2,210.87	2,188.68	22.19	99.617	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow federal 14H - Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,200.00	6,313.74	5,536.93	5,532.71	58.06	12.14	7.06	-90.48	-73.28	2,305.40	2,282.52	22.88	100.754	
8,300.00	6,316.28	5,525.00	5,521.43	60.73	12.10	6.95	-90.45	-69.42	2,400.51	2,376.93	23.58	101.818	
8,400.00	6,318.82	5,525.00	5,521.43	63.41	12.10	6.95	-90.45	-69.42	2,495.80	2,471.47	24.33	102.590	
8,500.00	6,321.36	5,525.00	5,521.43	66.10	12.10	6.95	-90.45	-69.42	2,591.44	2,566.36	25.08	103.313	
8,600.00	6,323.90	5,525.00	5,521.43	68.79	12.10	6.95	-90.45	-69.42	2,687.40	2,661.56	25.84	103.994	
8,700.00	6,326.44	5,525.00	5,521.43	71.49	12.10	6.95	-90.45	-69.42	2,783.64	2,757.04	26.60	104.635	
8,800.00	6,328.98	5,525.00	5,521.43	74.19	12.10	6.95	-90.45	-69.42	2,880.14	2,852.77	27.37	105.239	
8,900.00	6,331.52	5,511.82	5,508.83	76.90	12.07	6.84	-90.43	-65.55	2,976.62	2,948.56	28.06	106.075	
9,000.00	6,334.06	5,500.00	5,497.42	79.61	12.04	6.74	-90.41	-62.46	3,073.56	3,044.80	28.76	106.859	
9,100.00	6,336.60	5,500.00	5,497.42	82.32	12.04	6.74	-90.41	-62.46	3,170.50	3,140.97	29.53	107.367	
9,200.00	6,339.14	5,500.00	5,497.42	85.03	12.04	6.74	-90.41	-62.46	3,267.62	3,237.32	30.30	107.849	
9,300.00	6,341.69	5,500.00	5,497.42	87.75	12.04	6.74	-90.41	-62.46	3,364.91	3,333.84	31.07	108.307	
9,400.00	6,344.23	5,500.00	5,497.42	90.47	12.04	6.74	-90.41	-62.46	3,462.36	3,430.52	31.84	108.743	
9,500.00	6,346.77	5,500.00	5,497.42	93.19	12.04	6.74	-90.41	-62.46	3,559.94	3,527.33	32.61	109.158	
9,600.00	6,349.31	5,500.00	5,497.42	95.91	12.04	6.74	-90.41	-62.46	3,657.66	3,624.27	33.39	109.554	
9,700.00	6,351.85	5,500.00	5,497.42	98.64	12.04	6.74	-90.41	-62.46	3,755.50	3,721.34	34.16	109.931	
9,800.00	6,354.39	5,500.00	5,497.42	101.37	12.04	6.74	-90.41	-62.46	3,853.45	3,818.51	34.94	110.292	
9,900.00	6,356.93	5,500.00	5,497.42	104.09	12.04	6.74	-90.41	-62.46	3,951.50	3,915.78	35.72	110.637	
10,000.00	6,359.47	5,487.90	5,485.65	106.82	12.01	6.63	-90.39	-59.66	4,049.44	4,013.03	36.41	111.220	
10,100.00	6,362.01	5,475.00	5,473.01	109.55	11.98	6.53	-90.37	-57.09	4,147.79	4,110.70	37.10	111.809	
10,200.00	6,364.55	5,475.00	5,473.01	112.28	11.98	6.53	-90.37	-57.09	4,246.00	4,208.13	37.87	112.111	
10,300.00	6,367.09	5,475.00	5,473.01	115.02	11.98	6.53	-90.37	-57.09	4,344.29	4,305.64	38.65	112.401	
10,400.00	6,369.63	5,475.00	5,473.01	117.75	11.98	6.53	-90.37	-57.09	4,442.66	4,403.23	39.43	112.679	
10,500.00	6,372.17	5,475.00	5,473.01	120.49	11.98	6.53	-90.37	-57.09	4,541.09	4,500.89	40.21	112.947	
10,600.00	6,374.71	5,475.00	5,473.01	123.22	11.98	6.53	-90.37	-57.09	4,639.60	4,598.61	40.98	113.204	
10,700.00	6,377.25	5,475.00	5,473.01	125.96	11.98	6.53	-90.37	-57.09	4,738.17	4,696.40	41.76	113.452	
10,808.13	6,380.00	5,475.00	5,473.01	128.92	11.98	6.53	-90.37	-57.09	4,844.81	4,802.21	42.61	113.710	

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	179.77	-25.00	0.10	25.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.77	-25.00	0.10	25.00	24.78	0.22	111.228	
200.00	200.00	200.00	200.00	0.34	0.34	179.77	-25.00	0.10	25.00	24.33	0.67	37.076	CC
225.32	225.32	225.31	225.31	0.39	0.39	-179.97	-25.00	-0.01	25.00	24.21	0.79	31.816	
300.00	300.00	299.96	299.94	0.56	0.55	-176.24	-25.01	-1.64	25.07	23.95	1.11	22.488	ES
400.00	400.00	399.67	399.51	0.79	0.78	-164.70	-25.04	-6.85	25.97	24.41	1.56	16.622	
500.00	500.00	499.43	499.02	1.01	1.01	-151.17	-25.09	-13.81	28.66	26.64	2.01	14.226	
600.00	600.00	599.18	598.54	1.24	1.26	-140.44	-25.13	-20.77	32.64	30.16	2.47	13.191	
700.00	700.00	698.94	698.05	1.46	1.51	-132.25	-25.18	-27.73	37.50	34.56	2.94	12.737	
800.00	800.00	798.70	797.56	1.69	1.76	-126.03	-25.22	-34.68	42.96	39.53	3.42	12.558	
900.00	900.00	898.45	897.08	1.91	2.01	-121.25	-25.27	-41.64	48.80	44.90	3.90	12.512	
1,000.00	1,000.00	999.46	997.92	2.14	2.24	-118.10	-25.31	-47.40	53.77	49.42	4.35	12.363	
1,100.00	1,100.00	1,100.72	1,099.13	2.36	2.43	-116.64	-25.33	-50.49	56.49	51.73	4.76	11.858	
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-116.39	-25.33	-51.06	57.00	51.82	5.18	11.004	
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-116.39	-25.33	-51.06	57.00	51.39	5.61	10.167	
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-116.39	-25.33	-51.06	57.00	50.96	6.04	9.443	
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-116.39	-25.33	-51.06	57.00	50.53	6.47	8.811	
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-116.39	-25.33	-51.06	57.00	50.09	6.90	8.257	
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-116.39	-25.33	-51.06	57.00	49.66	7.34	7.766	
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.86	-116.39	-25.33	-51.06	57.00	49.22	7.78	7.328	
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-116.39	-25.33	-51.06	57.00	48.78	8.22	6.937	
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-116.39	-25.33	-51.06	57.00	48.34	8.66	6.584	
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-116.39	-25.33	-51.06	57.00	47.90	9.10	6.265	
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-116.39	-25.33	-51.06	57.00	47.46	9.54	5.975	
2,300.00	2,300.00	2,301.60	2,300.00	5.06	4.94	-116.39	-25.33	-51.06	57.00	47.01	9.98	5.710	
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-116.39	-25.33	-51.06	57.00	46.57	10.43	5.467	
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-116.39	-25.33	-51.06	57.00	46.13	10.87	5.244	
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-116.39	-25.33	-51.06	57.00	45.68	11.31	5.038	
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-116.39	-25.33	-51.06	57.00	45.24	11.76	4.847	
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-116.39	-25.33	-51.06	57.00	44.79	12.20	4.671	
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.26	-116.39	-25.33	-51.06	57.00	44.35	12.65	4.506	
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-116.39	-25.33	-51.06	57.00	43.90	13.09	4.353	
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-116.39	-25.33	-51.06	57.00	43.46	13.54	4.209	
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-116.39	-25.33	-51.06	57.00	43.01	13.99	4.075	
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-116.39	-25.33	-51.06	57.00	42.56	14.43	3.949	
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-116.39	-25.33	-51.06	57.00	42.12	14.88	3.831	
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.58	-116.39	-25.33	-51.06	57.00	41.67	15.33	3.719	
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-116.39	-25.33	-51.06	57.00	41.22	15.77	3.614	
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-116.39	-25.33	-51.06	57.00	40.78	16.22	3.514	
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-116.39	-25.33	-51.06	57.00	40.33	16.67	3.420	
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-116.39	-25.33	-51.06	57.00	39.88	17.11	3.330	
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-116.39	-25.33	-51.06	57.00	39.43	17.56	3.246	
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-116.39	-25.33	-51.06	57.00	38.99	18.01	3.165	
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-116.39	-25.33	-51.06	57.00	38.54	18.46	3.088	
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-116.39	-25.33	-51.06	57.00	38.09	18.90	3.015	
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-116.39	-25.33	-51.06	57.00	37.64	19.35	2.945	
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-116.39	-25.33	-51.06	57.00	37.20	19.80	2.879	
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-116.39	-25.33	-51.06	57.00	36.75	20.25	2.815	
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-116.39	-25.33	-51.06	57.00	36.30	20.70	2.754	
4,800.00	4,800.00	4,801.60	4,800.00	10.68	10.48	-116.39	-25.33	-51.06	57.00	35.85	21.14	2.696	
4,900.00	4,900.00	4,901.60	4,900.00	10.90	10.70	-116.39	-25.33	-51.06	57.00	35.40	21.59	2.640	
5,000.00	5,000.00	5,001.60	5,000.00	11.13	10.92	-116.39	-25.33	-51.06	57.00	34.96	22.04	2.586	

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

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,100.00	5,101.60	5,100.00	11.35	11.15	-116.39	-25.33	-51.06	57.00	34.51	22.49	2.535	
5,200.00	5,200.00	5,201.60	5,200.00	11.58	11.37	-116.39	-25.33	-51.06	57.00	34.06	22.94	2.485	
5,300.00	5,300.00	5,301.60	5,300.00	11.80	11.59	-116.39	-25.33	-51.06	57.00	33.61	23.38	2.437	
5,400.00	5,400.00	5,401.60	5,400.00	12.02	11.82	-116.39	-25.33	-51.06	57.00	33.16	23.83	2.391	
5,500.00	5,500.00	5,501.60	5,500.00	12.25	12.04	-116.39	-25.33	-51.06	57.00	32.71	24.28	2.347	
5,600.00	5,600.00	5,601.60	5,600.00	12.47	12.26	-116.39	-25.33	-51.06	57.00	32.27	24.73	2.305	
5,700.00	5,700.00	5,701.60	5,700.00	12.70	12.49	-116.39	-25.33	-51.06	57.00	31.82	25.18	2.264	
5,747.91	5,747.91	5,749.51	5,747.91	12.81	12.60	-116.39	-25.33	-51.06	57.00	31.60	25.39	2.245	
5,800.00	5,800.00	5,800.00	5,798.39	12.92	12.71	-116.15	-25.33	-51.59	57.50	31.88	25.62	2.244 SF	
5,888.20	5,888.20	5,875.00	5,872.42	13.12	12.88	-112.01	-25.41	-62.86	69.61	43.62	25.99	2.678	
5,900.00	5,900.00	5,884.45	5,881.54	13.15	12.90	159.04	-25.42	-65.31	72.63	46.65	25.99	2.795	
5,925.00	5,924.94	5,904.08	5,900.30	13.20	12.95	160.49	-25.46	-71.10	81.04	55.03	26.00	3.116	
5,950.00	5,949.73	5,922.31	5,917.43	13.25	13.00	161.90	-25.50	-77.34	92.05	66.12	25.93	3.550	
5,975.00	5,974.25	5,938.93	5,932.77	13.30	13.05	163.10	-25.54	-83.74	105.50	79.73	25.77	4.094	
6,000.00	5,998.41	5,953.81	5,946.25	13.35	13.09	164.00	-25.58	-90.02	121.13	95.61	25.52	4.746	
6,025.00	6,022.09	5,966.89	5,957.90	13.41	13.13	164.58	-25.62	-95.98	138.70	113.51	25.19	5.507	
6,050.00	6,045.20	5,975.00	5,965.01	13.46	13.16	164.38	-25.65	-99.87	157.98	133.21	24.77	6.377	
6,075.00	6,067.64	5,987.77	5,976.04	13.53	13.20	164.62	-25.69	-106.30	178.58	154.29	24.29	7.352	
6,100.00	6,089.31	5,995.71	5,982.79	13.59	13.23	163.98	-25.71	-110.48	200.40	176.64	23.75	8.437	
6,125.00	6,110.12	6,000.00	5,986.40	13.67	13.25	162.29	-25.73	-112.80	223.18	199.98	23.20	9.618	
6,150.00	6,129.97	6,007.15	5,992.36	13.75	13.27	160.49	-25.75	-116.75	246.68	224.03	22.66	10.888	
6,175.00	6,148.80	6,010.88	5,995.44	13.85	13.29	156.60	-25.77	-118.86	270.77	248.50	22.27	12.156	
6,200.00	6,166.50	6,013.43	5,997.53	13.96	13.30	149.27	-25.78	-120.32	295.28	272.89	22.39	13.188	
6,225.00	6,183.01	6,014.93	5,998.75	14.08	13.30	133.22	-25.78	-121.18	320.05	296.02	24.03	13.320	
6,250.00	6,198.26	6,015.46	5,999.19	14.23	13.31	95.10	-25.79	-121.49	344.95	317.47	27.48	12.553	
6,275.00	6,212.19	6,015.13	5,998.92	14.39	13.31	49.24	-25.78	-121.30	369.88	345.99	23.89	15.483	
6,300.00	6,224.72	6,014.01	5,998.00	14.58	13.30	27.68	-25.78	-120.65	394.72	375.11	19.61	20.128	
6,325.00	6,235.81	6,012.19	5,996.51	14.80	13.29	18.23	-25.77	-119.61	419.39	402.04	17.35	24.175	
6,350.00	6,245.42	6,009.73	5,994.49	15.04	13.28	13.27	-25.76	-118.21	443.79	427.89	15.90	27.913	
6,375.00	6,253.49	6,000.00	5,986.40	15.30	13.25	9.83	-25.73	-112.80	467.95	453.19	14.76	31.704	
6,400.00	6,260.00	6,000.00	5,986.40	15.59	13.25	8.18	-25.73	-112.80	491.52	477.56	13.95	35.224	
6,425.00	6,264.92	6,000.00	5,986.40	15.91	13.25	6.97	-25.73	-112.80	514.67	501.34	13.32	38.625	
6,450.00	6,268.22	6,000.00	5,986.40	16.25	13.25	6.05	-25.73	-112.80	537.36	524.48	12.88	41.716	
6,475.00	6,269.90	5,989.85	5,977.83	16.61	13.21	5.16	-25.69	-107.38	559.34	546.72	12.62	44.329	
6,478.39	6,270.00	5,989.17	5,977.24	16.65	13.21	5.07	-25.69	-107.03	562.28	549.68	12.60	44.626	
6,497.84	6,270.50	5,985.31	5,973.94	16.95	13.20	5.00	-25.68	-105.03	579.17	566.52	12.65	45.798	
6,500.00	6,270.55	5,984.89	5,973.58	16.98	13.19	5.00	-25.68	-104.82	581.05	568.39	12.65	45.927	
6,600.00	6,273.09	5,975.00	5,965.01	18.66	13.16	4.85	-25.65	-99.87	669.44	656.49	12.95	51.675	
6,700.00	6,275.63	5,950.00	5,942.82	20.58	13.08	4.51	-25.57	-88.36	759.53	746.24	13.29	57.131	
6,800.00	6,278.17	5,939.28	5,933.09	22.67	13.05	4.37	-25.54	-83.88	851.25	837.53	13.71	62.078	
6,900.00	6,280.71	5,925.00	5,919.93	24.88	13.01	4.20	-25.51	-78.33	944.19	930.02	14.17	66.638	
7,000.00	6,283.25	5,925.00	5,919.93	27.20	13.01	4.20	-25.51	-78.33	1,038.13	1,023.43	14.69	70.666	
7,100.00	6,285.79	5,910.34	5,906.21	29.59	12.97	4.04	-25.47	-73.15	1,132.72	1,117.51	15.21	74.460	
7,200.00	6,288.33	5,900.00	5,896.43	32.04	12.94	3.93	-25.45	-69.82	1,228.06	1,212.29	15.77	77.876	
7,300.00	6,290.87	5,900.00	5,896.43	34.54	12.94	3.93	-25.45	-69.82	1,323.92	1,307.55	16.37	80.874	
7,400.00	6,293.41	5,900.00	5,896.43	37.07	12.94	3.93	-25.45	-69.82	1,420.35	1,403.36	16.99	83.600	
7,500.00	6,295.96	5,885.28	5,882.35	39.63	12.90	3.78	-25.42	-65.53	1,516.88	1,499.30	17.59	86.246	
7,600.00	6,298.50	5,875.00	5,872.42	42.22	12.88	3.69	-25.41	-62.86	1,613.95	1,595.74	18.21	88.633	
7,700.00	6,301.04	5,875.00	5,872.42	44.82	12.88	3.69	-25.41	-62.86	1,711.20	1,692.33	18.87	90.697	
7,800.00	6,303.58	5,875.00	5,872.42	47.44	12.88	3.69	-25.41	-62.86	1,808.74	1,789.21	19.53	92.592	
7,900.00	6,306.12	5,875.00	5,872.42	50.08	12.88	3.69	-25.41	-62.86	1,906.55	1,886.34	20.21	94.335	
8,000.00	6,308.66	5,875.00	5,872.42	52.73	12.88	3.69	-25.41	-62.86	2,004.56	1,983.67	20.89	95.943	

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

Anticollision Report

Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Offset Design Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

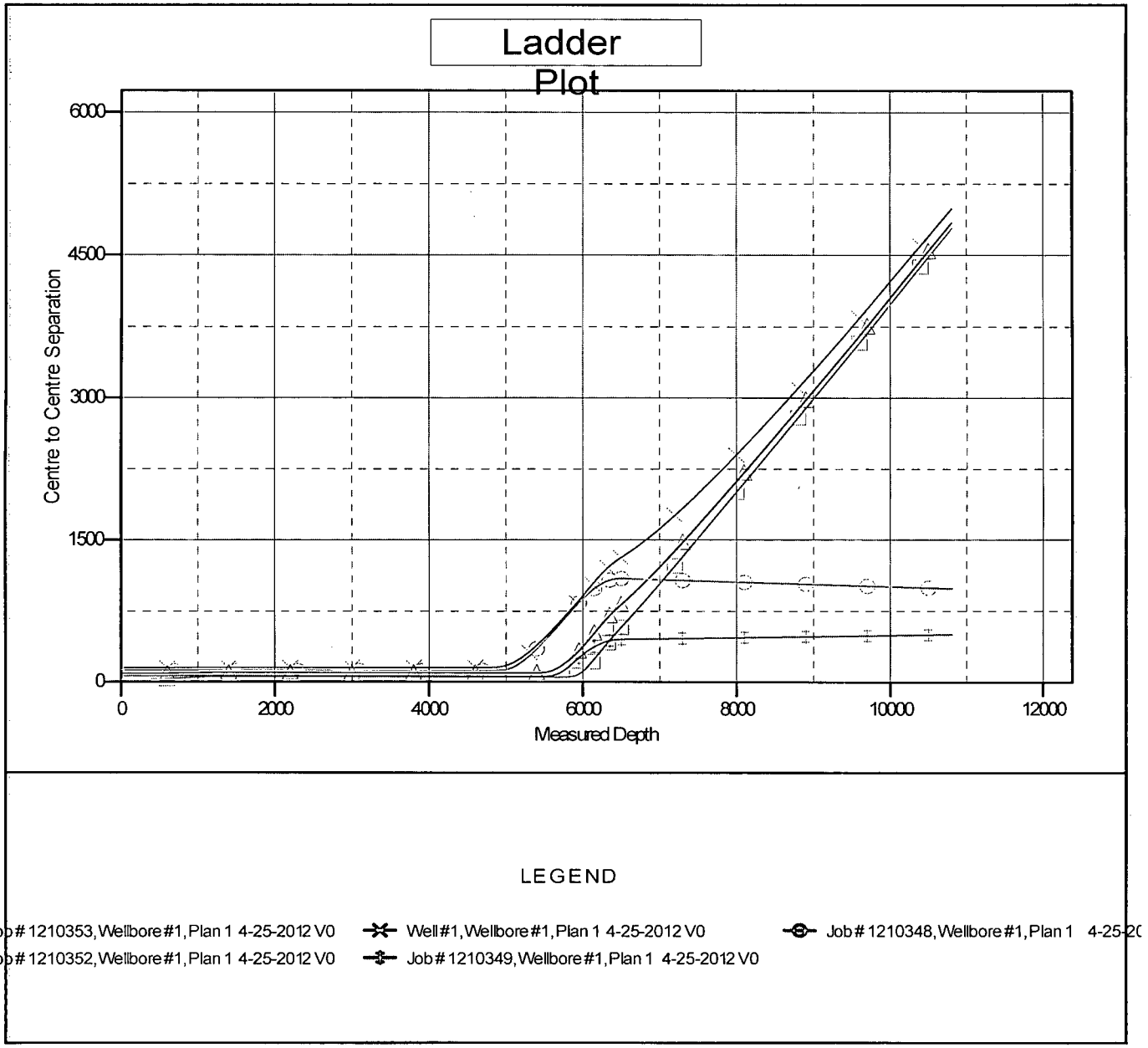
Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,100.00	6,311.20	5,862.38	5,860.14	55.39	12.85	3.57	-25.39	-59.95	2,102.52	2,080.98	21.54	97.588	
8,200.00	6,313.74	5,850.00	5,848.01	58.06	12.82	3.47	-25.37	-57.49	2,200.91	2,178.71	22.20	99.130	
8,300.00	6,316.28	5,850.00	5,848.01	60.73	12.82	3.47	-25.37	-57.49	2,299.22	2,276.32	22.90	100.404	
8,400.00	6,318.82	5,850.00	5,848.01	63.41	12.82	3.47	-25.37	-57.49	2,397.67	2,374.07	23.60	101.590	
8,500.00	6,321.36	5,850.00	5,848.01	66.10	12.82	3.47	-25.37	-57.49	2,496.25	2,471.94	24.31	102.697	
8,600.00	6,323.90	5,850.00	5,848.01	68.79	12.82	3.47	-25.37	-57.49	2,594.93	2,569.92	25.02	103.732	
8,700.00	6,326.44	5,850.00	5,848.01	71.49	12.82	3.47	-25.37	-57.49	2,693.71	2,667.98	25.73	104.701	
8,800.00	6,328.98	5,850.00	5,848.01	74.19	12.82	3.47	-25.37	-57.49	2,792.58	2,766.14	26.44	105.611	
8,900.00	6,331.52	5,850.00	5,848.01	76.90	12.82	3.47	-25.37	-57.49	2,891.52	2,864.36	27.16	106.466	
9,000.00	6,334.06	5,850.00	5,848.01	79.61	12.82	3.47	-25.37	-57.49	2,990.54	2,962.66	27.88	107.271	
9,100.00	6,336.60	5,850.00	5,848.01	82.32	12.82	3.47	-25.37	-57.49	3,089.62	3,061.02	28.60	108.031	
9,200.00	6,339.14	5,850.00	5,848.01	85.03	12.82	3.47	-25.37	-57.49	3,188.75	3,159.43	29.32	108.748	
9,300.00	6,341.69	5,838.67	5,836.84	87.75	12.79	3.38	-25.36	-55.59	3,287.75	3,257.75	30.00	109.578	
9,400.00	6,344.23	5,837.37	5,835.56	90.47	12.79	3.37	-25.36	-55.39	3,386.95	3,356.22	30.72	110.238	
9,500.00	6,346.77	5,825.00	5,823.30	93.19	12.76	3.27	-25.35	-53.73	3,486.36	3,454.95	31.40	111.016	
9,600.00	6,349.31	5,825.00	5,823.30	95.91	12.76	3.27	-25.35	-53.73	3,585.59	3,553.46	32.13	111.593	
9,700.00	6,351.85	5,825.00	5,823.30	98.64	12.76	3.27	-25.35	-53.73	3,684.87	3,652.01	32.86	112.142	
9,800.00	6,354.39	5,825.00	5,823.30	101.37	12.76	3.27	-25.35	-53.73	3,784.18	3,750.60	33.59	112.665	
9,900.00	6,356.93	5,825.00	5,823.30	104.09	12.76	3.27	-25.35	-53.73	3,883.53	3,849.22	34.32	113.164	
10,000.00	6,359.47	5,825.00	5,823.30	106.82	12.76	3.27	-25.35	-53.73	3,982.92	3,947.87	35.05	113.640	
10,100.00	6,362.01	5,825.00	5,823.30	109.55	12.76	3.27	-25.35	-53.73	4,082.33	4,046.55	35.78	114.094	
10,200.00	6,364.55	5,825.00	5,823.30	112.28	12.76	3.27	-25.35	-53.73	4,181.77	4,145.26	36.51	114.529	
10,300.00	6,367.09	5,825.00	5,823.30	115.02	12.76	3.27	-25.35	-53.73	4,281.24	4,243.99	37.25	114.945	
10,400.00	6,369.63	5,825.00	5,823.30	117.75	12.76	3.27	-25.35	-53.73	4,380.73	4,342.75	37.98	115.343	
10,500.00	6,372.17	5,825.00	5,823.30	120.49	12.76	3.27	-25.35	-53.73	4,480.24	4,441.53	38.71	115.725	
10,600.00	6,374.71	5,825.00	5,823.30	123.22	12.76	3.27	-25.35	-53.73	4,579.78	4,540.33	39.45	116.092	
10,700.00	6,377.25	5,825.00	5,823.30	125.96	12.76	3.27	-25.35	-53.73	4,679.33	4,639.15	40.19	116.444	
10,808.13	6,380.00	5,825.00	5,823.30	128.92	12.76	3.27	-25.35	-53.73	4,787.00	4,746.02	40.98	116.810	

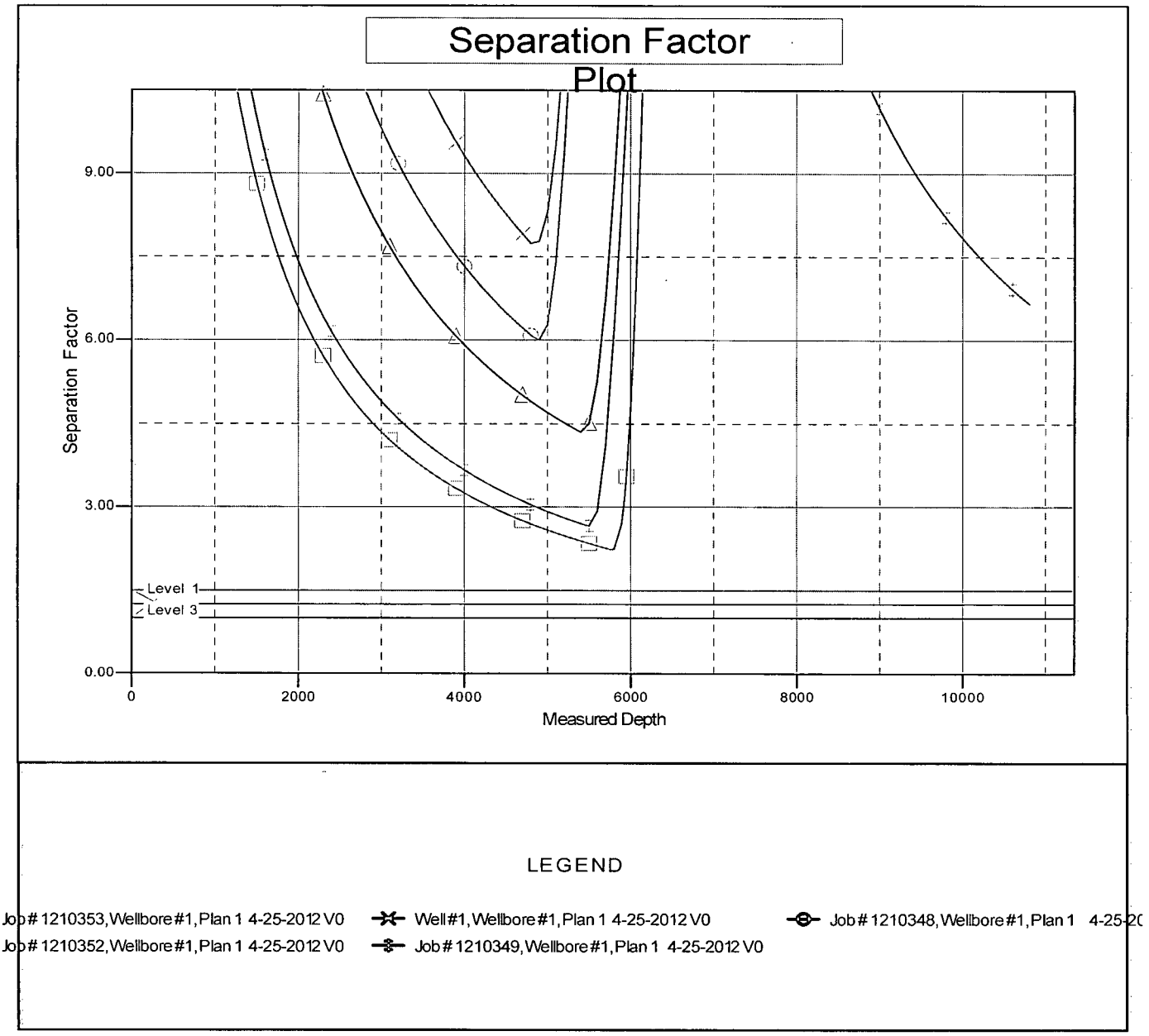
Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 3915.00usft (Original Well E
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.0000 W

Coordinates are relative to: Crow Federal 12H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.25°



Company:	Apache Corporation	**Local Co-ordinate Reference:**	Site Crow Federal 12H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	**MD Reference:**	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Job # 1210350	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Compass5000
Reference Design:	Plan 1 4-25-2012	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 3915.00usft (Original Well E
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.0000 W

Coordinates are relative to: Crow Federal 12H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.25°