

Crestone Peak Resources

DJ BASIN

S18-T2N-R67W (KUGEL)

KUGEL 1G-18H-H267

OH

PLAN #2 (6.11)

Anticollision Summary Report

12 June, 2018

Cathedral Energy Services

Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1G-18H-H267 - Slot KUGEL 1G
Project:	DJ BASIN	TVD Reference:	23' KB @ 4976.00usft
Reference Site:	S18-T2N-R67W (KUGEL)	MD Reference:	23' KB @ 4976.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	KUGEL 1G-18H-H267	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2 (6.11)	Offset TVD Reference:	Offset Datum

Reference	PLAN #2 (6.11)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	6/12/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	2,000.00	PLAN #2 (6.11) (OH)	VESSI_GYROFLEX	VESSI Gyroflex Gyro
2,001.00	15,342.77	PLAN #2 (6.11) (OH)	MWD+HDGM	OWSG MWD + HDGM

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S18-T2N-R67W (KUGEL)						
BRETT 1 - HS RESOURCES - NO SURVEYS	5,158.71	5,037.00	647.90	617.34	21.206	CC, ES, SF
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,430.19	5,035.00	2,268.83	2,238.01	73.609	CC, ES
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,700.00	5,035.00	2,284.82	2,253.45	72.830	SF
BRETT 3 - KMG WELL - NO SURVEY	5,293.29	5,040.00	2,138.47	2,107.24	68.485	CC
BRETT 3 - KMG WELL - NO SURVEY	5,300.00	5,040.00	2,138.48	2,107.23	68.439	ES
BRETT 3 - KMG WELL - NO SURVEY	5,600.00	5,040.00	2,160.35	2,128.40	67.619	SF
BRETT 4 - KMG WELL - GYRO	6,943.85	6,889.06	999.88	969.01	32.385	CC, ES
BRETT 4 - KMG WELL - GYRO	7,100.00	7,048.43	1,006.50	975.25	32.203	SF
DREW 1 - KMG WELL - GYRO	6,937.62	6,841.34	2,674.54	2,643.54	86.270	CC, ES
DREW 1 - KMG WELL - GYRO	7,700.00	7,326.29	2,826.91	2,793.31	84.146	SF
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,721.51	6,666.92	1,233.73	1,204.30	41.924	CC, ES
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,900.00	6,850.71	1,254.33	1,224.01	41.376	SF
FARNSWORTH 9-18A - KMG WELL - GYRO	5,475.13	5,413.63	623.92	599.61	25.664	CC
FARNSWORTH 9-18A - KMG WELL - GYRO	5,600.00	5,533.93	624.51	599.48	24.954	ES
FARNSWORTH 9-18A - KMG WELL - GYRO	6,700.00	6,615.18	665.11	633.94	21.341	SF
GTF RED V 6-16JI - KMG WELL - GYRO	15,342.96	7,249.70	804.79	684.91	6.713	CC, ES, SF
GTF RED V 6-4D - KMG WELL - GYRO	15,342.96	7,232.58	1,110.62	1,028.27	13.487	CC, ES, SF
GTF RED V6-16 - KMG WELL - GYRO	15,342.96	7,246.13	739.35	629.21	6.713	CC, ES, SF
HSR-OWEN 15-18A - KMG WELL - SURVEYS	3,820.68	3,601.28	1,322.67	1,308.48	93.203	CC, ES
HSR-OWEN 15-18A - KMG WELL - SURVEYS	7,100.00	7,154.38	2,148.81	2,111.89	58.204	SF
KUGEL 1 - EXTRACTION WELL - GYRO	8,894.14	7,334.48	274.40	229.31	6.086	CC, ES
KUGEL 1 - EXTRACTION WELL - GYRO	8,900.00	7,334.53	274.46	229.35	6.085	SF
KUGEL 1-18 - CPR WELL - GYRO	8,886.26	7,332.59	2,532.35	2,488.18	57.330	CC
KUGEL 1-18 - CPR WELL - GYRO	8,900.00	7,332.55	2,532.39	2,488.04	57.097	ES
KUGEL 1-18 - CPR WELL - GYRO	10,000.00	7,328.33	2,766.44	2,709.00	48.157	SF
KUGEL 12-18 - KMG WELL - GYRO	8,091.85	7,307.58	2,085.33	2,048.74	56.987	CC
KUGEL 12-18 - KMG WELL - GYRO	8,100.00	7,307.37	2,085.35	2,048.69	56.886	ES
KUGEL 12-18 - KMG WELL - GYRO	9,100.00	7,281.88	2,316.10	2,269.65	49.859	SF
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	558.60	560.55	55.53	53.77	31.468	CC, ES
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	15,342.96	15,610.00	1,381.97	1,131.71	5.522	SF
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	632.93	634.69	46.01	43.98	22.719	CC, ES
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	15,342.96	15,500.00	1,246.92	994.26	4.935	SF
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	711.31	712.93	36.16	33.86	15.722	CC, ES
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	15,342.96	15,429.95	1,071.28	818.02	4.230	SF
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	800.32	801.87	25.43	22.82	9.739	CC, ES
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	15,342.96	15,481.80	659.85	406.45	2.604	SF

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

Cathedral Energy Services

Anticollision Summary Report

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Site Error:	0.00 usft	North Reference:	True
Reference Well:	KUGEL 1G-18H-H267	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2 (6.11)	Offset TVD Reference:	Offset Datum

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
S18-T2N-R67W (KUGEL)						
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	847.89	848.30	16.45	13.67	5.925	CC, ES
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	15,342.96	15,546.66	512.54	268.52	2.100	SF
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	409.32	409.51	6.43	5.21	5.259	CC, ES
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	12,600.00	12,572.45	251.18	83.65	1.499	Level 3, SF
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	200.00	200.00	10.00	9.51	20.283	CC, ES
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	15,336.59	15,255.58	259.50	12.47	1.050	Level 2, SF
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	1,102.08	1,101.33	12.44	8.79	3.402	CC, ES
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	15,333.64	15,456.99	417.51	174.45	1.718	SF
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	29.99	29.50	60.829	CC, ES
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	15,000.00	14,919.32	604.90	362.73	2.498	SF
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	39.99	39.50	81.113	CC, ES
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	15,342.96	15,227.83	912.21	658.02	3.589	SF
KUGEL 1L-18H-H267 - OH - PLAN #2 (6.11)	827.34	830.40	8.53	5.83	3.158	CC, ES, SF
KUGEL 1M-18H-H267 - OH - PLAN #2 (6.11)	826.27	830.27	11.47	8.77	4.241	CC, ES, SF
KUGEL 1N-18H-H267 - OH - PLAN #2 (6.11)	768.87	773.79	17.93	15.42	7.121	CC, ES, SF
KUGEL 21-18 - CPR WELL - GYRO	9,589.01	7,338.45	2,017.28	1,962.82	37.047	CC
KUGEL 21-18 - CPR WELL - GYRO	9,600.00	7,338.68	2,017.31	1,962.68	36.933	ES
KUGEL 21-18 - CPR WELL - GYRO	10,200.00	7,351.30	2,112.77	2,050.41	33.883	SF
KUGEL 2-18 - CPR WELL - GYRO	8,370.97	7,333.75	201.73	162.57	5.151	CC, ES, SF
KUGEL 22-18 - CPR WELL - GYRO	8,113.40	7,264.13	1,959.50	1,922.81	53.405	CC, ES
KUGEL 22-18 - CPR WELL - GYRO	9,000.00	7,237.93	2,150.63	2,105.28	47.425	SF
KUGEL 31-18 - CPR WELL - GYRO	9,636.84	7,339.41	826.16	771.03	14.986	CC, ES
KUGEL 31-18 - CPR WELL - GYRO	9,800.00	7,340.33	842.12	784.80	14.692	SF
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	4,687.63	4,641.84	1,141.23	1,113.10	40.570	CC
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,000.00	4,950.85	1,142.14	1,111.65	37.451	ES
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,200.00	5,018.00	1,151.13	1,119.75	36.680	SF
KUGEL 41-18 - CPR WELL - GYRO	9,498.70	7,307.83	800.71	747.54	15.059	CC
KUGEL 41-18 - CPR WELL - GYRO	9,500.00	7,307.84	800.71	747.52	15.055	ES
KUGEL 41-18 - CPR WELL - GYRO	9,600.00	7,308.63	807.09	753.06	14.938	SF
KUGEL 42-18 - CPR WELL - GYRO	883.81	869.32	215.08	212.20	74.739	CC
KUGEL 42-18 - CPR WELL - GYRO	900.00	885.57	215.10	212.16	73.291	ES
KUGEL 42-18 - CPR WELL - GYRO	7,800.00	7,321.12	701.09	666.53	20.287	SF
KUGEL V18-3 - KMG WELL - GYRO	9,543.20	7,301.71	2,060.85	2,007.07	38.319	CC
KUGEL V18-3 - KMG WELL - GYRO	9,600.00	7,303.56	2,061.65	2,007.00	37.728	ES
KUGEL V18-3 - KMG WELL - GYRO	10,200.00	7,321.46	2,168.11	2,105.93	34.867	SF
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,374.45	5,010.00	2,415.04	2,383.91	77.590	CC, ES
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,700.00	5,010.00	2,436.88	2,404.98	76.400	SF
LISA 1 - KMG WELL - GYRO	7,103.23	6,994.78	2,185.83	2,154.00	68.673	CC, ES
LISA 1 - KMG WELL - GYRO	7,700.00	7,327.94	2,276.00	2,242.28	67.485	SF
LISA 2 - KMG WELL - GYRO	6,803.23	6,720.08	2,667.34	2,637.52	89.468	CC, ES
LISA 2 - KMG WELL - GYRO	7,200.00	7,088.64	2,729.06	2,697.79	87.288	SF
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	5,618.97	5,100.00	3,278.23	3,246.39	102.974	CC, ES
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	6,200.00	5,100.00	3,329.32	3,296.12	100.280	SF
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,656.11	5,026.00	3,801.95	3,770.40	120.478	CC, ES
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	6,400.00	5,026.00	3,874.04	3,840.68	116.125	SF
STREAR V 06-23D - KMG WELL - GYRO	15,342.96	7,341.56	1,336.57	1,299.95	36.496	CC, ES, SF
STREAR V 06-63HN - KMG WELL - SURVEYS	15,342.96	7,901.53	1,026.16	953.02	14.029	CC, ES, SF
WANDELL 1 - CPR WELL - GYRO	14,377.97	7,280.27	259.78	134.85	2.079	CC, ES, SF
WANDELL 21-7 - CPR WELL - GYRO	14,311.06	7,223.74	1,760.33	1,636.56	14.223	CC, ES
WANDELL 21-7 - CPR WELL - GYRO	14,600.00	7,216.92	1,783.87	1,655.26	13.871	SF
WANDELL 22-7 - CPR WELL - SURVEYS	13,198.24	7,583.15	1,617.88	1,505.70	14.422	CC
WANDELL 22-7 - CPR WELL - SURVEYS	13,200.00	7,583.16	1,617.88	1,505.66	14.417	ES
WANDELL 22-7 - CPR WELL - SURVEYS	13,500.00	7,585.11	1,645.78	1,528.12	13.988	SF

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Cathedral Energy Services

Anticollision Summary Report

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Reference Design:	PLAN #2 (6.11)	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S18-T2N-R67W (KUGEL)						
WANDELL 24-7 - CPR WELL - SURVEYS	10,564.17	7,455.17	1,836.62	1,751.76	21.642	CC
WANDELL 24-7 - CPR WELL - SURVEYS	10,600.00	7,455.35	1,836.97	1,751.50	21.493	ES
WANDELL 24-7 - CPR WELL - SURVEYS	11,000.00	7,457.33	1,887.62	1,796.87	20.799	SF
WANDELL 31-7 - CPR WELL - SURVEYS	14,764.41	7,384.74	643.37	498.91	4.454	CC
WANDELL 31-7 - CPR WELL - SURVEYS	14,800.00	7,384.71	644.36	498.70	4.424	ES, SF
WANDELL 32-7 - CPR WELL - GYRO	13,359.02	7,278.25	572.53	462.90	5.222	CC, ES
WANDELL 32-7 - CPR WELL - GYRO	13,400.00	7,278.26	574.00	463.14	5.178	SF
WANDELL 33-7 - CPR WELL - SURVEYS	12,054.37	7,455.60	546.15	436.13	4.964	CC, ES
WANDELL 33-7 - CPR WELL - SURVEYS	12,100.00	7,455.33	548.05	437.21	4.944	SF
WANDELL 34-7 - CPR WELL - GYRO	10,571.72	7,453.15	623.57	554.26	8.998	CC, ES
WANDELL 34-7 - CPR WELL - GYRO	10,600.00	7,453.14	624.21	554.30	8.930	SF
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,259.71	7,537.99	1,376.10	1,224.08	9.052	CC, ES
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,342.96	7,537.87	1,377.41	1,224.92	9.033	SF
WANDELL 41-7 - CPR WELL - SURVEYS	14,910.39	7,363.04	753.71	620.73	5.668	CC, ES, SF
WANDELL 42-7 - CPR WELL - SURVEYS	13,332.21	7,451.85	812.07	685.16	6.399	CC, ES, SF
WANDELL 43-7 - CPR WELL - SURVEYS	11,955.53	7,666.58	731.77	619.41	6.513	CC, ES, SF
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,563.75	7,635.07	1,285.37	1,175.65	11.715	CC
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,600.00	7,635.35	1,286.11	1,175.14	11.589	ES
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,800.00	7,636.99	1,314.43	1,197.76	11.267	SF
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,348.85	7,668.39	967.70	862.63	9.210	CC, ES
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,500.00	7,669.12	979.43	871.70	9.091	SF
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,310.53	7,372.41	97.57	-57.75	0.628	Level 1, CC, ES, SF
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,515.69	7,670.14	135.38	11.21	1.090	Level 2, CC, ES, SF
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,079.88	7,450.45	106.16	30.05	1.395	Level 3, CC, ES, SF
WANDELL 8-2-7 - CPR WELL - SURVEYS	14,051.81	7,454.74	1,268.86	1,134.23	9.425	CC, ES, SF
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,800.00	7,681.40	1,326.76	1,199.54	10.429	SF
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,843.34	7,681.59	1,326.05	1,198.92	10.431	CC, ES
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	10,969.17	7,306.00	488.45	410.49	6.266	CC, ES, SF

Cathedral Energy Services

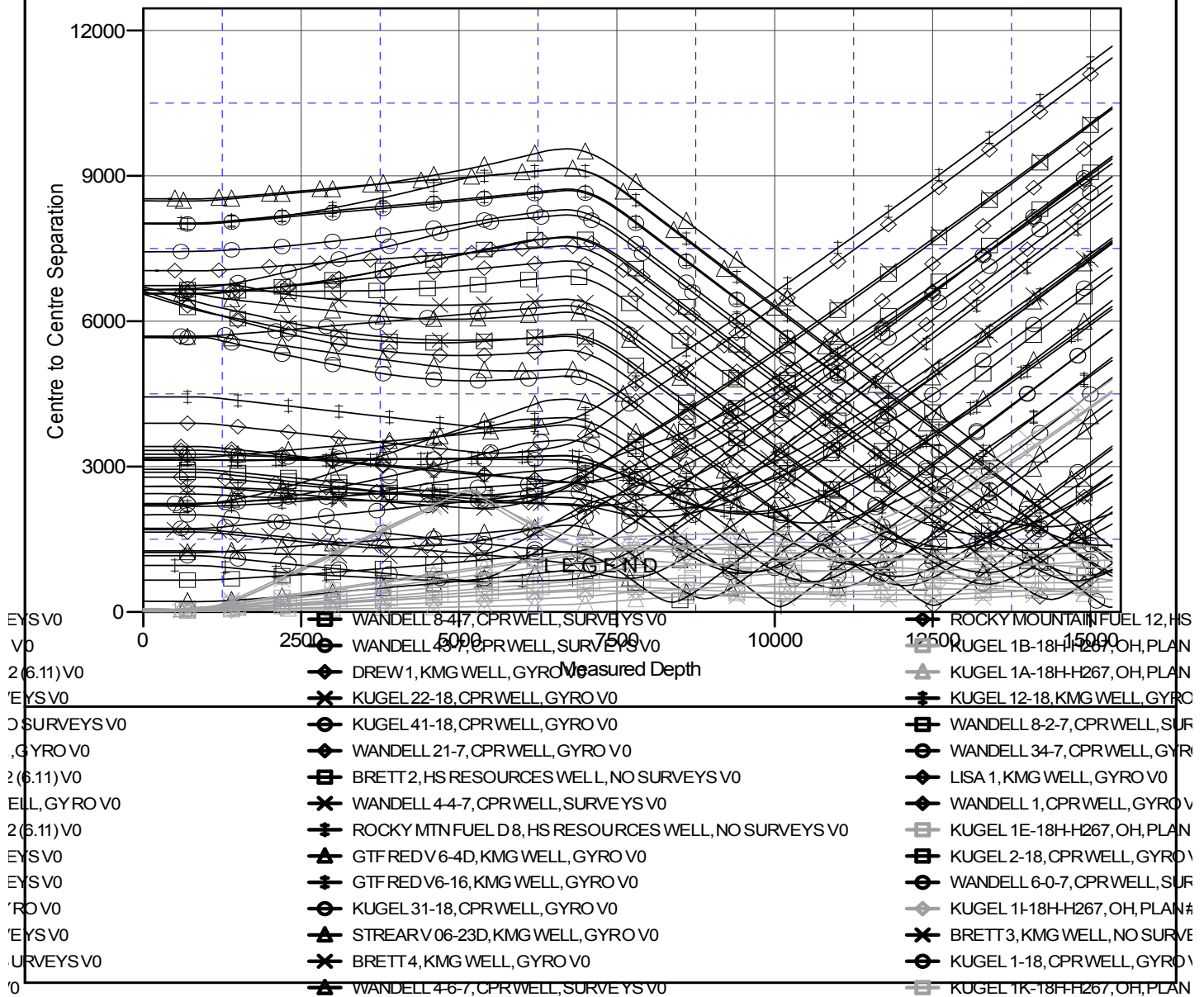
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Reference Well:	KUGEL 1G-18H-H267	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2 (6.11)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 23' KB @ 4976.00usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: KUGEL 1G-18H-H267 - Slot KUGEL 1G
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°

Ladder Plot



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

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Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

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