

Crestone Peak Resources

DJ BASIN

S18-T2N-R67W (KUGEL)

KUGEL 1E-18H-H267

OH

PLAN #2 (6.11)

Anticollision Summary Report

11 June, 2018

Cathedral Energy Services

Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1E-18H-H267 - Slot KUGEL 1E
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 1E-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	6/11/2018		
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	15,554.78	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	5,136.93	5,037.00	782.98	750.15	23.850	CC, ES
BRETT 1 - HS RESOURCES - NO SURVEYS	5,200.00	5,037.00	785.52	752.50	23.788	SF
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,487.45	5,035.00	2,149.96	2,117.58	66.398	CC, ES
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,700.00	5,035.00	2,160.44	2,127.56	65.710	SF
BRETT 3 - KMG WELL - NO SURVEY	5,240.27	5,040.00	2,251.18	2,218.06	67.974	CC, ES
BRETT 3 - KMG WELL - NO SURVEY	5,600.00	5,040.00	2,279.74	2,245.45	66.496	SF
BRETT 4 - KMG WELL - GYRO	7,087.10	6,969.04	558.44	527.08	17.804	CC, ES
BRETT 4 - KMG WELL - GYRO	7,200.00	7,078.87	565.15	533.22	17.700	SF
DREW 1 - KMG WELL - GYRO	7,173.45	7,011.70	2,205.13	2,173.06	68.769	CC, ES
DREW 1 - KMG WELL - GYRO	7,500.00	7,288.16	2,241.66	2,208.48	67.569	SF
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,902.05	6,796.37	1,192.03	1,158.16	35.195	CC, ES
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	7,000.00	6,894.00	1,198.70	1,164.24	34.779	SF
FARNSWORTH 9-18A - KMG WELL - GYRO	2,924.41	2,872.64	861.44	851.04	82.769	CC
FARNSWORTH 9-18A - KMG WELL - GYRO	3,100.00	3,047.34	861.87	850.50	75.849	ES
FARNSWORTH 9-18A - KMG WELL - GYRO	6,900.00	6,757.73	1,139.09	1,106.21	34.648	SF
GTF RED V 6-16JI - KMG WELL - GYRO	15,554.78	7,396.17	1,234.51	1,100.64	9.222	CC, ES, SF
GTF RED V 6-4D - KMG WELL - GYRO	15,554.78	7,385.56	927.52	888.01	23.473	CC, ES, SF
GTF RED V6-16 - KMG WELL - GYRO	15,554.78	7,387.31	1,144.89	1,013.90	8.740	CC, ES, SF
HSR-OWEN 15-18A - KMG WELL - SURVEYS	4,022.99	3,728.89	1,128.75	1,113.44	73.706	CC, ES
HSR-OWEN 15-18A - KMG WELL - SURVEYS	7,100.00	7,102.21	1,909.49	1,871.68	50.510	SF
KUGEL 1 - EXTRACTION WELL - GYRO	9,124.37	7,485.05	696.30	651.41	15.512	CC, ES
KUGEL 1 - EXTRACTION WELL - GYRO	9,200.00	7,485.66	700.40	655.22	15.503	SF
KUGEL 1-18 - CPR WELL - GYRO	8,937.78	7,500.00	2,102.18	2,060.19	50.065	CC, ES
KUGEL 1-18 - CPR WELL - GYRO	9,900.00	7,500.00	2,311.93	2,258.33	43.133	SF
KUGEL 12-18 - KMG WELL - GYRO	8,168.86	7,468.35	1,610.00	1,573.54	44.162	CC, ES
KUGEL 12-18 - KMG WELL - GYRO	8,900.00	7,449.06	1,768.13	1,725.08	41.072	SF
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	492.88	494.40	37.02	35.49	24.212	CC
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	500.00	501.48	37.03	35.48	23.825	ES
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	15,500.00	15,610.00	881.71	630.59	3.511	SF
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	557.95	559.30	27.60	25.85	15.701	CC, ES
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	15,554.78	15,505.17	773.53	522.47	3.081	SF
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	617.16	618.39	18.10	16.13	9.202	CC, ES
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	15,554.78	15,448.41	620.19	375.91	2.539	SF
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	686.96	688.12	8.57	6.36	3.878	CC
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	700.00	701.14	8.58	6.33	3.808	ES
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	15,554.78	15,481.80	227.37	14.16	1.066	Level 2, 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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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 1E-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 1F-18H-H267 - OH - PLAN #2 (6.11)	200.00	198.00	9.99	9.50	20.410	CC
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	6,788.80	6,780.88	34.32	-5.98	0.852	Level 1, ES, SF
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	848.80	845.39	16.43	13.66	5.926	CC, ES
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	15,544.43	15,346.77	511.66	267.18	2.093	SF
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	200.00	197.00	29.99	29.50	61.496	CC, ES
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	15,542.48	15,255.58	771.18	526.19	3.148	SF
KUGEL 1K-18H-H267 - OH - PLAN #3 (6.11)	965.09	961.11	32.54	29.36	10.228	CC, ES
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	15,554.78	15,456.99	879.62	625.71	3.464	SF
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	200.00	197.00	49.98	49.49	102.486	CC, ES
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	15,200.00	14,878.43	1,087.90	849.21	4.558	SF
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	300.00	297.00	59.98	59.14	71.096	CC, ES
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	15,554.78	15,227.75	1,416.27	1,164.80	5.632	SF
KUGEL 1L-18H-H267 - OH - PLAN #2 (6.11)	863.74	864.00	21.03	18.19	7.417	CC, ES, SF
KUGEL 1M-18H-H267 - OH - PLAN #2 (6.11)	860.00	860.37	23.94	21.11	8.461	CC, ES, SF
KUGEL 1N-18H-H267 - OH - PLAN #2 (6.11)	811.48	813.26	28.42	25.75	10.634	CC, ES, SF
KUGEL 21-18 - CPR WELL - GYRO	9,674.56	7,477.02	1,634.10	1,582.44	31.633	CC
KUGEL 21-18 - CPR WELL - GYRO	9,700.00	7,477.47	1,634.30	1,582.23	31.386	ES
KUGEL 21-18 - CPR WELL - GYRO	10,200.00	7,486.28	1,716.47	1,657.48	29.099	SF
KUGEL 2-18 - CPR WELL - GYRO	646.80	629.87	640.06	638.00	311.273	CC
KUGEL 2-18 - CPR WELL - GYRO	8,600.00	7,478.20	658.62	619.11	16.669	ES, SF
KUGEL 22-18 - CPR WELL - GYRO	8,198.00	7,440.42	1,489.40	1,452.80	40.691	CC
KUGEL 22-18 - CPR WELL - GYRO	8,200.00	7,440.35	1,489.40	1,452.79	40.679	ES
KUGEL 22-18 - CPR WELL - GYRO	8,800.00	7,421.62	1,606.35	1,564.32	38.216	SF
KUGEL 31-18 - CPR WELL - GYRO	9,796.16	7,490.62	445.97	392.80	8.387	CC
KUGEL 31-18 - CPR WELL - GYRO	9,800.00	7,490.66	445.99	392.72	8.372	ES
KUGEL 31-18 - CPR WELL - GYRO	9,900.00	7,491.49	457.90	402.81	8.312	SF
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,116.82	5,018.00	893.54	860.84	27.319	CC, ES
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,200.00	5,018.00	897.41	864.44	27.225	SF
KUGEL 41-18 - CPR WELL - GYRO	9,760.90	7,452.53	1,184.24	1,131.48	22.444	CC, ES
KUGEL 41-18 - CPR WELL - GYRO	9,900.00	7,453.65	1,192.38	1,138.63	22.181	SF
KUGEL 42-18 - CPR WELL - GYRO	650.44	635.28	219.72	217.67	107.007	CC, ES
KUGEL 42-18 - CPR WELL - GYRO	8,100.00	7,447.90	1,203.37	1,167.51	33.558	SF
KUGEL V18-3 - KMG WELL - GYRO	9,625.84	7,449.57	1,676.60	1,625.56	32.848	CC, ES
KUGEL V18-3 - KMG WELL - GYRO	10,200.00	7,459.24	1,772.16	1,713.27	30.092	SF
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,531.98	5,010.00	2,086.12	2,054.57	66.116	CC, ES
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,700.00	5,010.00	2,092.88	2,061.00	65.658	SF
LISA 1 - KMG WELL - GYRO	7,302.67	7,137.89	1,693.64	1,660.77	51.525	CC, ES
LISA 1 - KMG WELL - GYRO	7,500.00	7,297.81	1,706.19	1,672.86	51.196	SF
LISA 2 - KMG WELL - GYRO	7,037.54	6,899.67	2,283.76	2,252.55	73.172	CC, ES
LISA 2 - KMG WELL - GYRO	7,400.00	7,236.36	2,349.36	2,316.37	71.213	SF
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	5,675.61	5,100.00	3,196.26	3,162.58	94.905	CC, ES
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	6,300.00	5,100.00	3,256.68	3,221.36	92.208	SF
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,786.71	5,026.00	3,630.51	3,597.48	109.911	CC
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,800.00	5,026.00	3,630.54	3,597.46	109.771	ES
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	6,500.00	5,026.00	3,699.92	3,665.10	106.263	SF
STREAR V 06-23D - KMG WELL - GYRO	15,554.78	7,459.57	1,381.96	1,319.27	22.044	CC, ES, SF
STREAR V 06-63HN - KMG WELL - SURVEYS	15,554.78	8,446.07	1,127.65	1,040.92	13.002	CC, ES, SF
WANDELL 1 - CPR WELL - GYRO	14,566.67	7,433.67	692.80	568.42	5.570	CC, ES, SF
WANDELL 21-7 - CPR WELL - GYRO	14,626.86	7,384.19	1,328.49	1,203.32	10.613	CC, ES
WANDELL 21-7 - CPR WELL - GYRO	14,800.00	7,379.72	1,339.72	1,211.75	10.469	SF
WANDELL 22-7 - CPR WELL - SURVEYS	13,512.17	7,735.87	1,254.64	1,141.71	11.109	CC, ES
WANDELL 22-7 - CPR WELL - SURVEYS	13,700.00	7,737.31	1,268.62	1,152.19	10.896	SF
WANDELL 24-7 - CPR WELL - SURVEYS	10,754.14	7,615.70	1,495.57	1,412.29	17.959	CC

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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
S18-T2N-R67W (KUGEL)						
WANDELL 24-7 - CPR WELL - SURVEYS	10,800.00	7,616.04	1,496.27	1,412.17	17.791	ES
WANDELL 24-7 - CPR WELL - SURVEYS	11,100.00	7,618.28	1,535.03	1,446.74	17.385	SF
WANDELL 31-7 - CPR WELL - SURVEYS	15,011.13	7,538.94	182.21	36.81	1.253	Level 3, CC, ES, SF
WANDELL 32-7 - CPR WELL - GYRO	13,603.54	7,431.14	201.76	92.39	1.845	CC, ES, SF
WANDELL 33-7 - CPR WELL - SURVEYS	12,257.17	7,605.97	220.98	112.70	2.041	CC, ES, SF
WANDELL 34-7 - CPR WELL - GYRO	10,774.14	7,606.29	282.82	215.15	4.180	CC, ES
WANDELL 34-7 - CPR WELL - GYRO	10,800.00	7,606.32	284.00	215.55	4.149	SF
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,488.20	7,692.03	886.13	734.51	5.844	CC, ES
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,500.00	7,692.03	886.21	734.53	5.843	SF
WANDELL 41-7 - CPR WELL - SURVEYS	15,068.94	7,513.28	1,220.84	1,088.64	9.235	CC, ES
WANDELL 41-7 - CPR WELL - SURVEYS	15,100.00	7,513.90	1,221.24	1,088.79	9.221	SF
WANDELL 42-7 - CPR WELL - SURVEYS	13,487.82	7,601.95	1,177.40	1,051.74	9.370	CC
WANDELL 42-7 - CPR WELL - SURVEYS	13,500.00	7,602.05	1,177.46	1,051.73	9.365	ES, SF
WANDELL 43-7 - CPR WELL - SURVEYS	12,173.37	7,821.10	1,056.85	946.20	9.551	CC, ES, SF
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,800.18	7,779.39	962.77	854.02	8.853	CC, ES
WANDELL 4-4-7 - CPR WELL - SURVEYS	13,000.00	7,780.68	983.29	867.84	8.517	SF
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,548.09	7,820.23	634.56	531.27	6.144	CC, ES
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,600.00	7,820.46	636.68	532.01	6.083	SF
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,515.57	7,524.96	391.56	236.50	2.525	CC, ES, SF
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,723.54	7,821.86	454.85	332.36	3.713	CC, ES, SF
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,294.44	7,601.22	454.27	379.24	6.054	CC
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,300.00	7,601.25	454.31	379.24	6.052	ES, SF
WANDELL 8-2-7 - CPR WELL - SURVEYS	14,176.22	7,605.17	1,678.84	1,545.44	12.585	CC
WANDELL 8-2-7 - CPR WELL - SURVEYS	14,200.00	7,605.32	1,679.00	1,545.42	12.569	ES
WANDELL 8-2-7 - CPR WELL - SURVEYS	14,300.00	7,605.94	1,683.39	1,549.25	12.549	SF
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,966.50	7,826.59	1,658.98	1,533.43	13.214	CC, ES
WANDELL 8-4-7 - CPR WELL - SURVEYS	13,000.00	7,826.74	1,659.32	1,533.65	13.205	SF
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	11,183.71	7,457.00	825.01	748.51	10.784	CC, ES
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	11,200.00	7,457.00	825.17	748.58	10.774	SF

Cathedral Energy Services

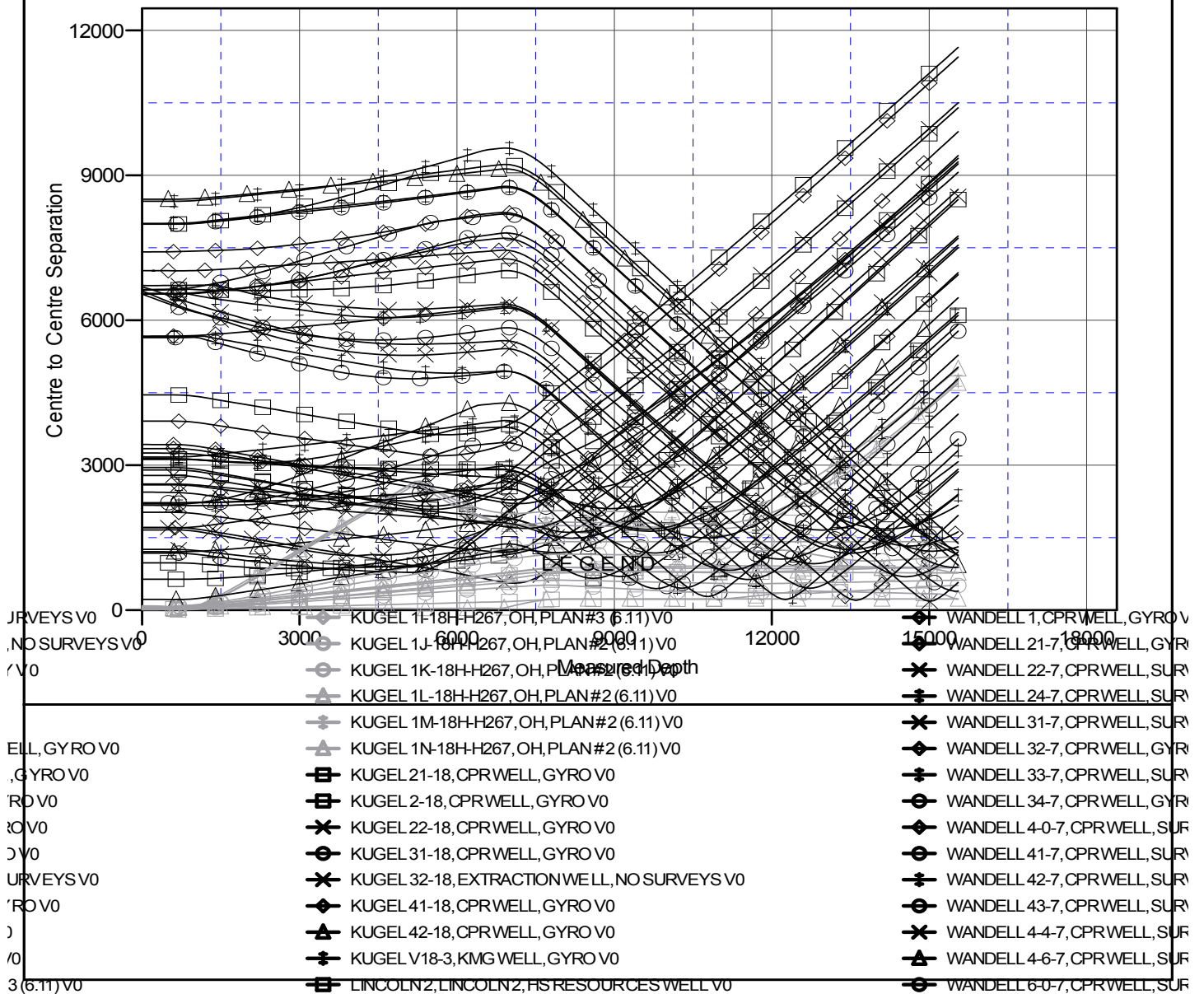
Anticollision Summary Report

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Project:	DJ BASIN	TVD Reference:	23' KB @ 4976.00usft
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Site Error:	0.00 usft	North Reference:	True
Reference Well:	KUGEL 1E-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 1E-18H-H267 - Slot KUGEL 1E
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°

Ladder Plot



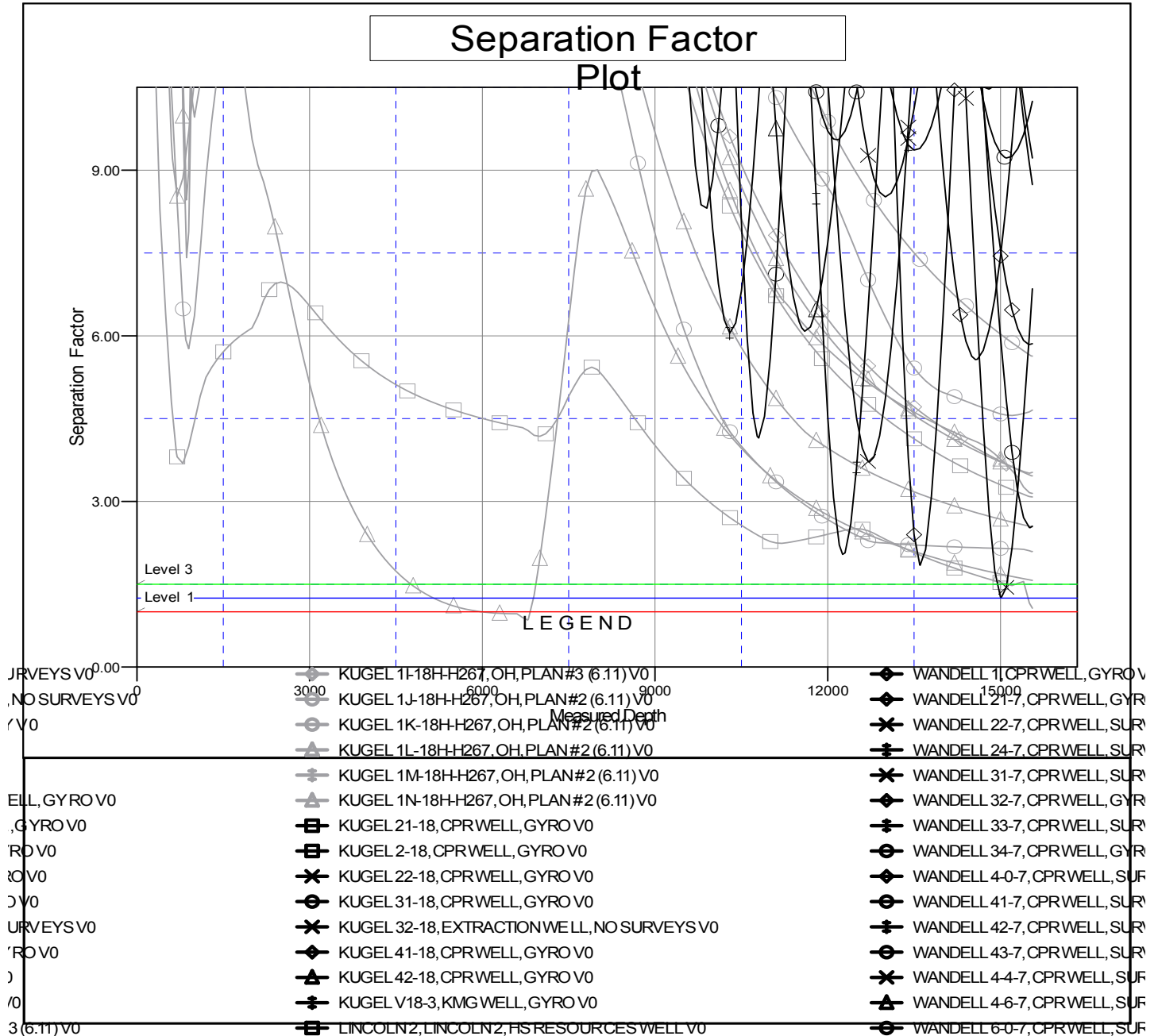
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Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2 (6.11)	Offset TVD Reference:	Offset Datum

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



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