

Crestone Peak Resources

DJ BASIN

S18-T2N-R67W (KUGEL)

KUGEL 1J-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 1J-18H-H267 - Slot KUGEL 1J
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 1J-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	15,324.09	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	5,130.60	5,037.00	678.55	648.71	22.739	CC, ES, SF
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,271.82	5,035.00	2,453.73	2,423.24	80.495	CC, ES
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,600.00	5,035.00	2,475.58	2,444.26	79.056	SF
BRETT 3 - KMG WELL - NO SURVEY	5,275.64	5,040.00	2,055.96	2,025.83	68.226	CC, ES
BRETT 3 - KMG WELL - NO SURVEY	5,500.00	5,040.00	2,068.17	2,037.55	67.545	SF
BRETT 4 - KMG WELL - GYRO	6,703.54	6,688.98	1,541.01	1,510.84	51.082	CC, ES
BRETT 4 - KMG WELL - GYRO	7,200.00	7,218.94	1,578.24	1,546.25	49.336	SF
DREW 1 - KMG WELL - GYRO	6,625.79	6,550.58	3,211.56	3,181.85	108.107	CC, ES
DREW 1 - KMG WELL - GYRO	8,800.00	7,358.99	3,994.03	3,954.15	100.170	SF
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,665.08	6,639.90	1,475.39	1,446.09	50.344	CC, ES
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,800.00	6,778.24	1,485.55	1,455.62	49.635	SF
FARNSWORTH 9-18A - KMG WELL - GYRO	6,668.65	6,611.94	190.40	161.46	6.578	CC, ES
FARNSWORTH 9-18A - KMG WELL - GYRO	6,700.00	6,643.26	191.01	161.91	6.564	SF
GTF RED V 6-16J - KMG WELL - GYRO	15,324.25	7,252.53	475.23	440.07	13.517	CC, ES, SF
GTF RED V 6-4D - KMG WELL - GYRO	15,324.25	7,240.40	1,582.02	1,465.52	13.579	CC, ES, SF
GTF RED V6-16 - KMG WELL - GYRO	15,324.25	7,248.73	526.58	478.05	10.851	CC, ES, SF
HSR-OWEN 15-18A - KMG WELL - SURVEYS	3,458.02	3,377.03	1,511.91	1,499.44	121.274	CC, ES
HSR-OWEN 15-18A - KMG WELL - SURVEYS	7,000.00	7,011.66	2,416.99	2,377.80	61.677	SF
KUGEL 1 - EXTRACTION WELL - GYRO	8,886.90	7,334.22	441.31	396.21	9.785	CC, ES
KUGEL 1 - EXTRACTION WELL - GYRO	8,900.00	7,334.34	441.50	396.25	9.758	SF
KUGEL 1-18 - CPR WELL - GYRO	8,734.12	7,348.37	3,243.89	3,201.41	76.357	CC
KUGEL 1-18 - CPR WELL - GYRO	8,800.00	7,348.33	3,244.56	3,201.30	75.004	ES
KUGEL 1-18 - CPR WELL - GYRO	10,300.00	7,349.31	3,638.08	3,579.30	61.890	SF
KUGEL 12-18 - KMG WELL - GYRO	597.47	595.56	2,592.13	2,590.24	1,368.090	CC
KUGEL 12-18 - KMG WELL - GYRO	600.00	598.09	2,592.13	2,590.23	1,361.665	ES
KUGEL 12-18 - KMG WELL - GYRO	9,500.00	7,261.03	3,155.21	3,106.14	64.306	SF
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	200.37	201.39	89.97	89.48	181.356	CC, ES
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	15,200.00	15,582.56	2,005.50	1,756.56	8.056	SF
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	200.00	201.00	79.97	79.48	161.621	CC, ES
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	15,200.00	15,442.12	1,876.82	1,626.99	7.512	SF
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	200.00	201.00	69.98	69.49	141.431	CC, ES
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	15,100.00	15,187.27	1,678.13	1,431.33	6.800	SF
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	200.00	201.00	59.98	59.49	121.221	CC, ES
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	15,300.00	15,481.80	1,314.37	1,061.02	5.188	SF
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	49.98	49.49	101.376	CC, ES
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	15,000.00	15,218.06	1,097.44	854.85	4.524	SF

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

Cathedral Energy Services

Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1J-18H-H267 - Slot KUGEL 1J
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 1J-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	200.00	39.99	39.50	81.113	CC, ES
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	15,000.00	14,981.44	1,009.41	764.54	4.122	SF
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	29.99	29.50	60.829	CC, ES
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	15,000.00	15,061.71	577.01	332.12	2.356	SF
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	200.00	200.00	19.99	19.50	40.546	CC
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	14,400.00	14,327.01	198.17	-18.04	0.917	Level 1, ES, SF
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	200.00	200.00	10.00	9.51	20.283	CC, ES
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	14,800.00	14,934.02	235.86	35.50	1.177	Level 2, SF
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	387.30	383.90	4.41	3.27	3.868	CC, ES
KUGEL 1K-18H-H267 - OH - PLAN #2 (6.11)	15,324.25	15,227.75	258.52	9.24	1.037	Level 2, SF
KUGEL 1L-18H-H267 - OH - PLAN #2 (6.11)	447.61	443.04	6.14	4.79	4.551	CC, ES, SF
KUGEL 1M-18H-H267 - OH - PLAN #2 (6.11)	483.08	477.44	8.61	7.14	5.848	CC, ES, SF
KUGEL 1N-18H-H267 - OH - PLAN #2 (6.11)	481.71	476.53	11.78	10.31	7.991	CC, ES, SF
KUGEL 21-18 - CPR WELL - GYRO	9,462.59	7,341.16	2,765.78	2,713.11	52.515	CC
KUGEL 21-18 - CPR WELL - GYRO	9,500.00	7,341.94	2,766.03	2,712.86	52.021	ES
KUGEL 21-18 - CPR WELL - GYRO	10,400.00	7,361.03	2,963.75	2,900.69	47.002	SF
KUGEL 2-18 - CPR WELL - GYRO	8,360.83	7,339.61	486.84	447.61	12.410	CC, ES
KUGEL 2-18 - CPR WELL - GYRO	8,400.00	7,340.67	488.41	448.84	12.343	SF
KUGEL 22-18 - CPR WELL - GYRO	650.79	674.08	2,434.30	2,432.16	1,141.651	CC, ES
KUGEL 22-18 - CPR WELL - GYRO	9,400.00	7,184.75	2,983.73	2,935.80	62.253	SF
KUGEL 31-18 - CPR WELL - GYRO	9,550.17	7,351.82	1,579.15	1,525.24	29.294	CC, ES
KUGEL 31-18 - CPR WELL - GYRO	9,900.00	7,355.14	1,629.13	1,571.35	28.194	SF
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	528.45	520.04	1,264.39	1,261.89	505.711	CC, ES
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,100.00	5,018.00	1,490.94	1,460.96	49.731	SF
KUGEL 41-18 - CPR WELL - GYRO	9,518.13	7,312.04	53.05	-0.37	0.993	Level 1, CC, ES, SF
KUGEL 42-18 - CPR WELL - GYRO	7,705.62	7,329.65	38.45	4.39	1.129	Level 2, CC, ES, SF
KUGEL V18-3 - KMG WELL - GYRO	9,413.73	7,300.00	2,806.89	2,754.96	54.045	CC, ES
KUGEL V18-3 - KMG WELL - GYRO	10,400.00	7,322.01	3,018.36	2,955.54	48.051	SF
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,112.47	5,010.00	2,791.98	2,761.72	92.255	CC, ES
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,600.00	5,010.00	2,834.23	2,802.53	89.407	SF
LISA 1 - KMG WELL - GYRO	3,386.62	3,306.28	2,716.89	2,704.85	225.539	CC
LISA 1 - KMG WELL - GYRO	3,500.00	3,409.00	2,717.13	2,704.53	215.612	ES
LISA 1 - KMG WELL - GYRO	8,600.00	7,344.13	3,291.88	3,252.93	84.517	SF
LISA 2 - KMG WELL - GYRO	6,656.54	6,602.24	3,129.90	3,100.25	105.570	CC, ES
LISA 2 - KMG WELL - GYRO	7,100.00	7,023.02	3,196.75	3,165.39	101.936	SF
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	5,438.84	5,100.00	3,412.08	3,380.92	109.499	CC, ES
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	6,100.00	5,100.00	3,475.54	3,442.70	105.829	SF
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,379.06	5,026.00	4,023.05	3,992.19	130.379	CC
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,400.00	5,026.00	4,023.10	3,992.18	130.085	ES
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	6,400.00	5,026.00	4,150.57	4,117.03	123.739	SF
STREAR V 06-23D - KMG WELL - GYRO	15,324.25	7,345.64	1,543.95	1,465.04	19.568	CC, ES, SF
STREAR V 06-63HN - KMG WELL - SURVEYS	15,324.25	7,426.63	963.37	912.07	18.782	CC, ES, SF
WANDELL 1 - CPR WELL - GYRO	14,326.55	7,271.89	344.82	219.12	2.743	CC, ES, SF
WANDELL 21-7 - CPR WELL - GYRO	14,274.06	7,213.98	2,365.32	2,240.59	18.963	CC
WANDELL 21-7 - CPR WELL - GYRO	14,300.00	7,213.39	2,365.46	2,240.26	18.892	ES
WANDELL 21-7 - CPR WELL - GYRO	14,700.00	7,200.00	2,403.35	2,272.60	18.382	SF
WANDELL 22-7 - CPR WELL - SURVEYS	13,464.86	7,588.56	2,277.37	2,159.53	19.325	CC
WANDELL 22-7 - CPR WELL - SURVEYS	13,500.00	7,588.76	2,277.86	2,159.48	19.243	ES
WANDELL 22-7 - CPR WELL - SURVEYS	13,700.00	7,589.98	2,299.04	2,178.10	19.009	SF
WANDELL 24-7 - CPR WELL - SURVEYS	10,388.53	7,451.29	2,664.01	2,582.07	32.511	CC
WANDELL 24-7 - CPR WELL - SURVEYS	10,400.00	7,451.34	2,664.04	2,581.93	32.444	ES
WANDELL 24-7 - CPR WELL - SURVEYS	11,100.00	7,454.72	2,757.38	2,666.92	30.480	SF
WANDELL 31-7 - CPR WELL - SURVEYS	14,717.22	7,380.76	1,245.31	1,099.97	8.569	CC, ES

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

Cathedral Energy Services

Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1J-18H-H267 - Slot KUGEL 1J
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Site Error:	0.00 usft	North Reference:	True
Reference Well:	KUGEL 1J-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	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 31-7 - CPR WELL - SURVEYS	14,800.00	7,380.41	1,248.04	1,100.97	8.486	SF
WANDELL 32-7 - CPR WELL - GYRO	13,472.89	7,277.55	1,219.82	1,107.02	10.814	CC, ES
WANDELL 32-7 - CPR WELL - GYRO	13,500.00	7,277.56	1,220.25	1,107.15	10.789	SF
WANDELL 33-7 - CPR WELL - SURVEYS	12,117.88	7,457.37	1,452.14	1,342.25	13.214	CC, ES
WANDELL 33-7 - CPR WELL - SURVEYS	12,300.00	7,456.26	1,457.76	1,346.61	13.115	SF
WANDELL 34-7 - CPR WELL - GYRO	10,465.91	7,450.39	1,453.41	1,386.04	21.575	CC
WANDELL 34-7 - CPR WELL - GYRO	10,500.00	7,450.36	1,453.81	1,385.93	21.418	ES
WANDELL 34-7 - CPR WELL - GYRO	10,700.00	7,450.21	1,472.14	1,401.80	20.931	SF
WANDELL 4-0-7 - CPR WELL - SURVEYS	14,998.17	7,538.20	1,991.80	1,841.67	13.268	CC
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,000.00	7,538.20	1,991.80	1,841.64	13.265	ES
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,200.00	7,537.92	2,009.05	1,856.60	13.179	SF
WANDELL 41-7 - CPR WELL - SURVEYS	14,860.05	7,356.28	151.52	18.04	1.135	Level 2, CC, ES, SF
WANDELL 42-7 - CPR WELL - SURVEYS	13,243.15	7,449.10	138.96	12.30	1.097	Level 2, CC, ES, SF
WANDELL 43-7 - CPR WELL - SURVEYS	11,934.49	7,663.84	176.48	65.36	1.588	CC, ES, SF
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,957.76	7,648.24	2,092.27	1,973.86	17.669	CC
WANDELL 4-4-7 - CPR WELL - SURVEYS	13,000.00	7,648.46	2,092.70	1,973.53	17.561	ES
WANDELL 4-4-7 - CPR WELL - SURVEYS	13,300.00	7,650.07	2,123.76	2,000.37	17.211	SF
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,221.95	7,670.61	1,841.70	1,739.35	17.993	CC, ES
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,600.00	7,672.52	1,880.10	1,772.67	17.499	SF
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,157.77	7,363.80	734.08	582.73	4.850	CC
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,200.00	7,363.80	735.61	582.38	4.801	ES, SF
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,600.00	7,667.38	710.95	587.32	5.751	SF
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,622.35	7,667.32	710.59	587.19	5.758	CC, ES
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,020.33	7,450.04	694.98	619.83	9.248	CC, ES
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,100.00	7,450.35	699.54	623.70	9.224	SF
WANDELL 8-2-7 - CPR WELL - SURVEYS	13,993.34	7,447.69	661.93	526.63	4.892	CC, ES, SF
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,637.79	7,678.63	517.07	391.62	4.122	CC, ES
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,700.00	7,678.95	520.80	394.15	4.112	SF
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	10,926.72	7,306.00	366.12	289.32	4.767	CC, ES, SF

Cathedral Energy Services
Anticollision Summary Report

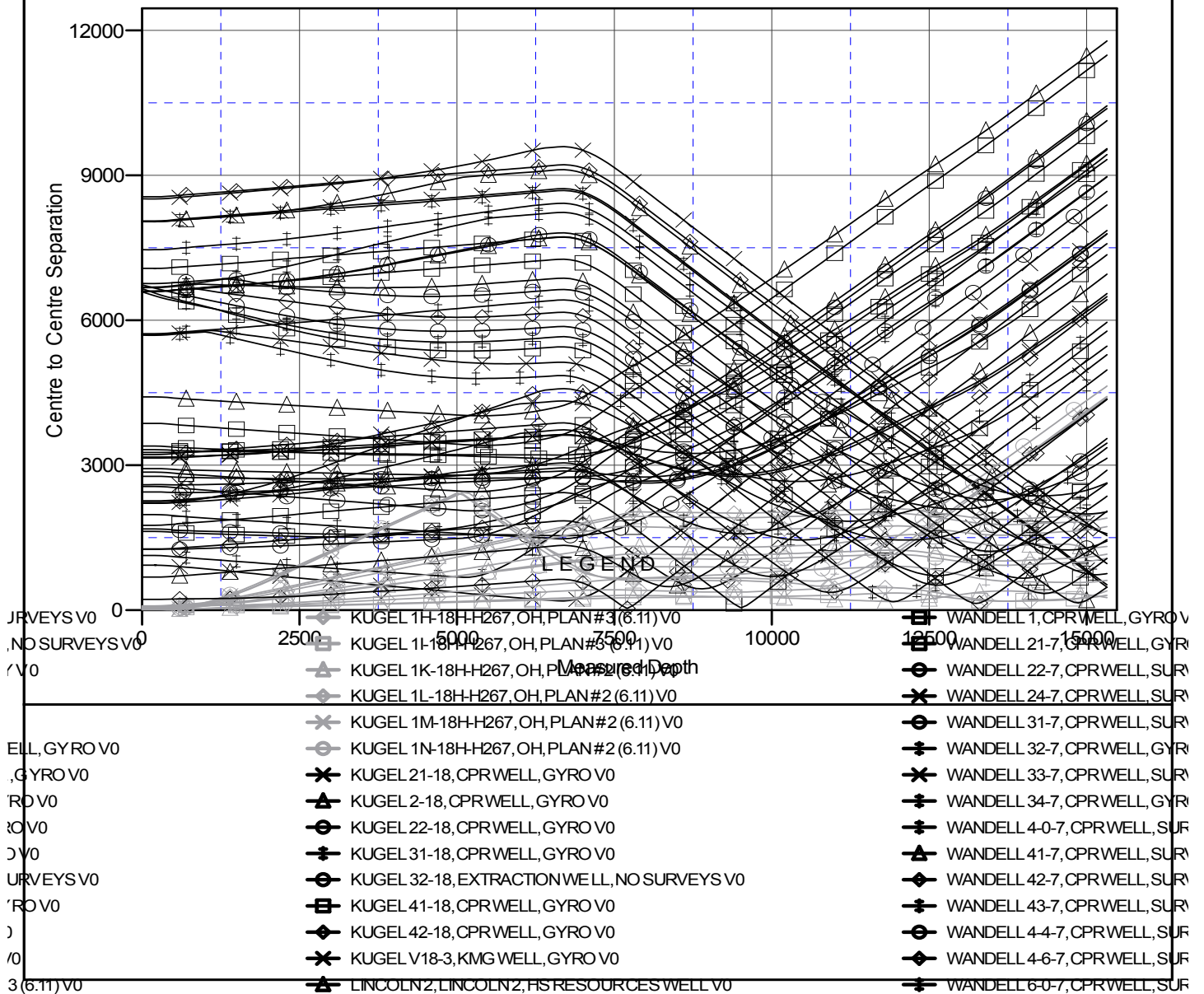
Company: Crestone Peak Resources
Project: DJ BASIN
Reference Site: S18-T2N-R67W (KUGEL)
Site Error: 0.00 usft
Reference Well: KUGEL 1J-18H-H267
Well Error: 0.00 usft
Reference Wellbore OH
Reference Design: PLAN #2 (6.11)

Local Co-ordinate Reference: Well KUGEL 1J-18H-H267 - Slot KUGEL 1J
TVD Reference: 23' KB @ 4976.00usft
MD Reference: 23' KB @ 4976.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
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 1J-18H-H267 - Slot KUGEL 1J
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

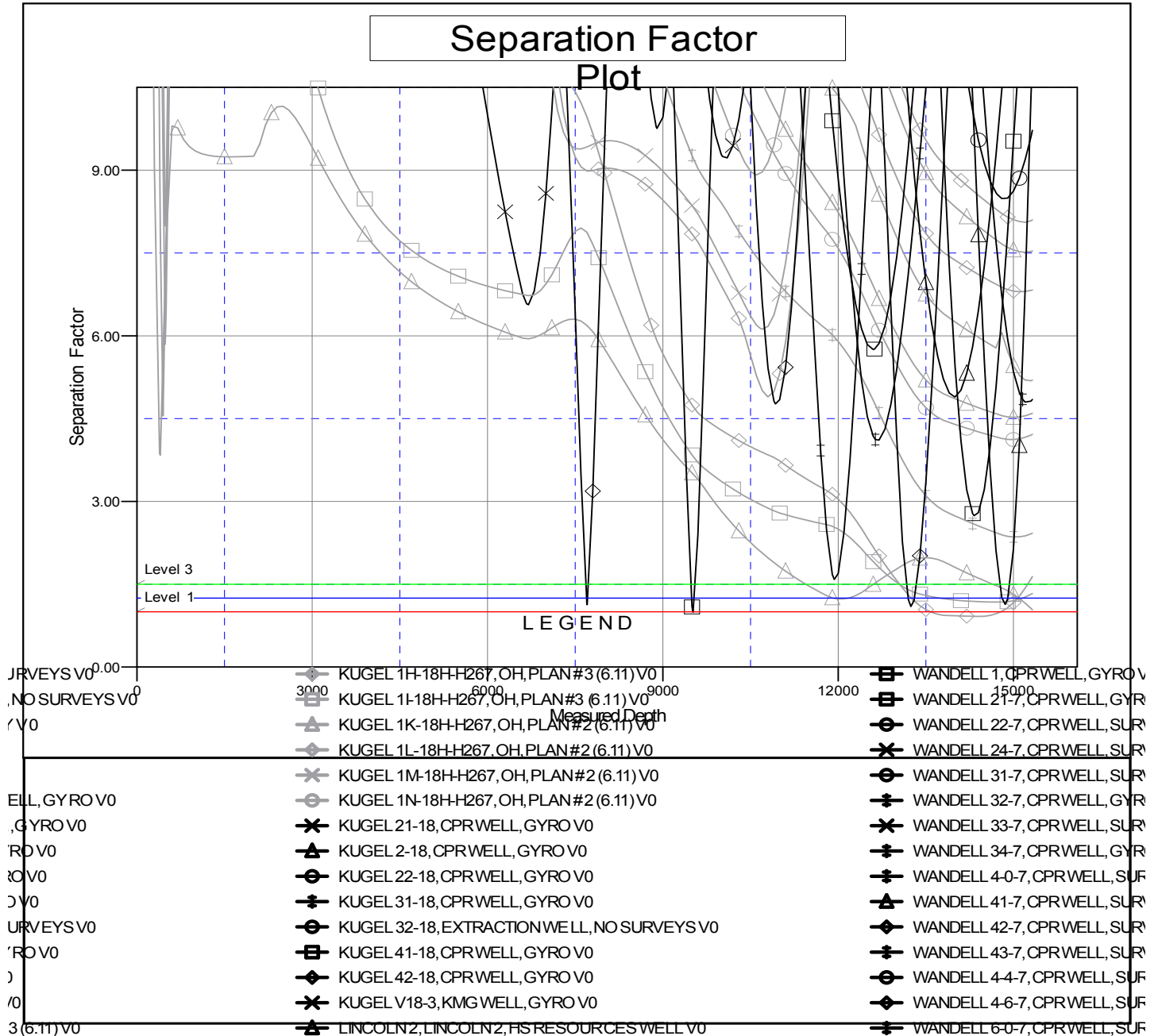
Cathedral Energy Services
Anticollision Summary Report

Company: Crestone Peak Resources
Project: DJ BASIN
Reference Site: S18-T2N-R67W (KUGEL)
Site Error: 0.00 usft
Reference Well: KUGEL 1J-18H-H267
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: PLAN #2 (6.11)

Local Co-ordinate Reference: Well KUGEL 1J-18H-H267 - Slot KUGEL 1J
TVD Reference: 23' KB @ 4976.00usft
MD Reference: 23' KB @ 4976.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
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 1J-18H-H267 - Slot KUGEL 1J
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°



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