

Crestone Peak Resources

DJ BASIN

S18-T2N-R67W (KUGEL)

KUGEL 1K-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 1K-18H-H267 - Slot KUGEL 1K
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 1K-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	15,227.17	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	5,118.18	5,037.00	766.82	736.51	25.295	CC, ES, SF
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,227.24	5,035.00	2,553.82	2,523.08	83.093	CC, ES
BRETT 2 - HS RESOURCES WELL - NO SURVEYS	5,600.00	5,035.00	2,580.88	2,549.11	81.247	SF
BRETT 3 - KMG WELL - NO SURVEY	5,276.90	5,040.00	2,053.00	2,022.65	67.655	CC, ES
BRETT 3 - KMG WELL - NO SURVEY	5,500.00	5,040.00	2,065.08	2,034.24	66.955	SF
BRETT 4 - KMG WELL - GYRO	2,530.23	2,483.86	1,662.96	1,654.69	200.979	CC
BRETT 4 - KMG WELL - GYRO	2,600.00	2,546.45	1,663.18	1,654.65	195.178	ES
BRETT 4 - KMG WELL - GYRO	7,200.00	7,209.84	1,819.43	1,787.29	56.605	SF
DREW 1 - KMG WELL - GYRO	138.38	107.05	3,316.83	3,316.60	10,000.000	CC
DREW 1 - KMG WELL - GYRO	200.00	159.99	3,316.91	3,316.49	7,809.968	ES
DREW 1 - KMG WELL - GYRO	9,100.00	7,276.53	4,428.15	4,386.43	106.150	SF
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,600.00	6,575.58	1,615.46	1,585.84	54.530	CC, ES
DREW GAS UNIT-TRUE 1 - KMG WELL - GYRO	6,800.00	6,770.78	1,640.14	1,609.65	53.788	SF
FARNSWORTH 9-18A - KMG WELL - GYRO	6,600.00	6,539.22	206.94	177.53	7.036	CC, ES, SF
GTF RED V 6-16JI - KMG WELL - GYRO	15,227.83	7,186.98	542.32	464.04	6.928	CC, ES, SF
GTF RED V 6-4D - KMG WELL - GYRO	15,227.83	7,170.82	1,791.01	1,667.90	14.548	CC, ES, SF
GTF RED V6-16 - KMG WELL - GYRO	15,227.83	7,180.39	634.59	543.42	6.961	CC, ES, SF
HSR-OWEN 15-18A - KMG WELL - SURVEYS	2,676.13	2,634.08	1,604.51	1,595.84	185.003	CC
HSR-OWEN 15-18A - KMG WELL - SURVEYS	2,700.00	2,655.81	1,604.53	1,595.76	182.933	ES
HSR-OWEN 15-18A - KMG WELL - SURVEYS	7,100.00	7,159.60	2,641.31	2,600.61	64.893	SF
KUGEL 1 - EXTRACTION WELL - GYRO	8,817.84	7,262.84	703.74	659.24	15.815	CC, ES
KUGEL 1 - EXTRACTION WELL - GYRO	8,900.00	7,263.65	708.52	663.25	15.649	SF
KUGEL 1-18 - CPR WELL - GYRO	202.35	172.26	3,269.07	3,268.67	8,249.729	CC, ES
KUGEL 1-18 - CPR WELL - GYRO	10,600.00	7,135.02	4,017.55	3,956.37	65.674	SF
KUGEL 12-18 - KMG WELL - GYRO	0.00	0.00	2,597.89			
KUGEL 12-18 - KMG WELL - GYRO	9,600.00	7,183.19	3,468.56	3,418.76	69.647	SF
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	201.04	202.07	99.97	99.47	200.560	CC, ES
KUGEL 1A-18H-H267 - OH - PLAN #3 (6.11)	15,227.83	15,610.00	2,290.99	2,040.26	9.137	SF
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	200.00	201.00	89.97	89.48	181.832	CC, ES
KUGEL 1B-18H-H267 - OH - PLAN #3 (6.11)	15,227.83	15,495.97	2,156.35	1,904.13	8.549	SF
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	200.00	201.00	79.98	79.49	161.642	CC, ES
KUGEL 1C-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,396.63	1,977.91	1,725.08	7.823	SF
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	200.00	201.00	69.98	69.49	141.431	CC, ES
KUGEL 1D-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,481.80	1,570.93	1,317.44	6.197	SF
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	59.98	59.49	121.659	CC, ES
KUGEL 1E-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,532.52	1,416.55	1,165.32	5.638	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 1K-18H-H267 - Slot KUGEL 1K
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 1K-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
S18-T2N-R67W (KUGEL)						
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	243.42	244.00	49.99	49.34	77.316	CC
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	300.00	301.25	50.06	49.22	59.164	ES
KUGEL 1F-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,295.90	1,319.25	1,064.97	5.188	SF
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	200.00	200.00	39.99	39.50	81.113	CC, ES
KUGEL 1G-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,346.21	870.01	616.31	3.429	SF
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	293.18	294.00	29.87	29.05	36.313	CC
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	300.00	300.87	29.88	29.03	35.291	ES
KUGEL 1H-18H-H267 - OH - PLAN #3 (6.11)	14,600.00	14,577.17	544.62	310.78	2.329	SF
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	200.00	200.00	20.00	19.51	40.566	CC, ES
KUGEL 1I-18H-H267 - OH - PLAN #3 (6.11)	15,227.83	15,444.19	564.26	324.06	2.349	SF
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	300.89	301.27	9.39	8.54	11.020	CC, ES
KUGEL 1J-18H-H267 - OH - PLAN #2 (6.11)	15,227.83	15,324.25	259.30	10.52	1.042	Level 2, SF
KUGEL 1L-18H-H267 - OH - PLAN #2 (6.11)	373.57	369.52	8.02	6.92	7.327	CC, ES
KUGEL 1L-18H-H267 - OH - PLAN #2 (6.11)	10,723.89	8,145.30	272.45	170.93	2.684	SF
KUGEL 1M-18H-H267 - OH - PLAN #2 (6.11)	460.42	455.42	11.84	10.44	8.457	CC, ES
KUGEL 1M-18H-H267 - OH - PLAN #2 (6.11)	10,600.00	8,203.63	371.49	272.99	3.772	SF
KUGEL 1N-18H-H267 - OH - PLAN #2 (6.11)	481.29	476.72	9.21	7.73	6.219	CC, ES, SF
KUGEL 21-18 - CPR WELL - GYRO	9,365.41	7,253.81	3,035.24	2,983.64	58.826	CC
KUGEL 21-18 - CPR WELL - GYRO	9,400.00	7,255.20	3,035.44	2,983.38	58.315	ES
KUGEL 21-18 - CPR WELL - GYRO	10,600.00	7,307.16	3,276.51	3,211.37	50.298	SF
KUGEL 2-18 - CPR WELL - GYRO	207.46	191.74	694.00	693.50	1,369.846	CC, ES
KUGEL 2-18 - CPR WELL - GYRO	8,400.00	7,271.13	751.74	712.15	18.988	SF
KUGEL 22-18 - CPR WELL - GYRO	208.11	204.64	2,447.83	2,447.32	4,745.562	CC, ES
KUGEL 22-18 - CPR WELL - GYRO	9,500.00	7,101.80	3,293.64	3,245.00	67.715	SF
KUGEL 31-18 - CPR WELL - GYRO	9,490.04	7,280.43	1,849.93	1,796.55	34.659	CC
KUGEL 31-18 - CPR WELL - GYRO	9,500.00	7,280.45	1,849.95	1,796.45	34.576	ES
KUGEL 31-18 - CPR WELL - GYRO	10,000.00	7,281.34	1,918.93	1,860.19	32.667	SF
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	200.00	193.00	1,269.54	1,268.79	1,706.812	CC, ES
KUGEL 32-18 - EXTRACTION WELL - NO SURVEYS	5,100.00	5,018.00	1,643.96	1,614.04	54.948	SF
KUGEL 41-18 - CPR WELL - GYRO	9,454.51	7,242.97	217.05	164.20	4.107	CC, ES, SF
KUGEL 42-18 - CPR WELL - GYRO	1,131.29	1,112.52	198.67	194.90	52.690	CC
KUGEL 42-18 - CPR WELL - GYRO	7,643.61	7,263.66	211.43	177.70	6.269	ES, SF
KUGEL V18-3 - KMG WELL - GYRO	9,315.97	7,231.18	3,074.95	3,024.06	60.416	CC, ES
KUGEL V18-3 - KMG WELL - GYRO	10,600.00	7,263.30	3,332.12	3,267.25	51.367	SF
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	200.00	172.00	2,925.62	2,924.95	4,395.244	CC
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	3,300.00	3,253.24	2,935.99	2,918.41	167.093	ES
LINCOLN 2 - LINCOLN 2 - HS RESOURCES WELL	5,700.00	5,010.00	3,030.23	2,998.08	94.257	SF
LISA 1 - KMG WELL - GYRO	200.63	175.20	2,767.17	2,766.72	6,112.880	CC, ES
LISA 1 - KMG WELL - GYRO	8,800.00	7,280.55	3,655.48	3,615.22	90.782	SF
LISA 2 - KMG WELL - GYRO	3,522.41	3,400.00	3,317.28	3,304.62	261.921	CC
LISA 2 - KMG WELL - GYRO	6,510.28	6,430.27	3,319.60	3,290.36	113.492	ES
LISA 2 - KMG WELL - GYRO	7,100.00	7,001.54	3,418.10	3,386.51	108.188	SF
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	5,394.76	5,100.00	3,487.16	3,455.76	111.042	CC
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	5,400.00	5,100.00	3,487.17	3,455.75	110.979	ES
ROCKY MOUNTAIN FUEL 12 - HS RESOURCES WELL	6,100.00	5,100.00	3,557.76	3,524.45	106.791	SF
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	5,304.65	5,026.00	4,128.29	4,097.30	133.217	CC, ES
ROCKY MTN FUEL D 8 - HS RESOURCES WELL - NO	6,400.00	5,026.00	4,271.13	4,237.07	125.394	SF
STREAR V 06-23D - KMG WELL - GYRO	15,227.83	7,291.11	1,684.78	1,590.76	17.919	CC, ES, SF
STREAR V 06-63HN - KMG WELL - SURVEYS	15,227.83	7,151.43	958.41	902.55	17.159	CC, ES, SF
WANDELL 1 - CPR WELL - GYRO	14,261.66	7,200.00	703.82	578.66	5.624	CC, ES
WANDELL 1 - CPR WELL - GYRO	14,300.00	7,200.00	704.86	579.36	5.616	SF
WANDELL 21-7 - CPR WELL - GYRO	14,327.92	7,161.37	2,723.80	2,597.74	21.607	CC
WANDELL 21-7 - CPR WELL - GYRO	14,400.00	7,160.52	2,724.75	2,597.66	21.438	ES

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Cathedral Energy Services

Anticollision Summary Report

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S18-T2N-R67W (KUGEL)						
WANDELL 21-7 - CPR WELL - GYRO	14,800.00	7,155.92	2,764.40	2,632.99	21.036	SF
WANDELL 22-7 - CPR WELL - SURVEYS	13,206.44	7,516.59	2,655.44	2,541.70	23.345	CC, ES
WANDELL 22-7 - CPR WELL - SURVEYS	13,800.00	7,519.91	2,720.97	2,599.89	22.472	SF
WANDELL 24-7 - CPR WELL - SURVEYS	10,448.62	7,381.00	2,894.99	2,811.65	34.736	CC
WANDELL 24-7 - CPR WELL - SURVEYS	10,500.00	7,381.00	2,895.45	2,811.39	34.447	ES
WANDELL 24-7 - CPR WELL - SURVEYS	11,200.00	7,381.00	2,990.91	2,899.02	32.548	SF
WANDELL 31-7 - CPR WELL - SURVEYS	14,706.19	7,309.49	1,580.07	1,434.18	10.831	CC, ES
WANDELL 31-7 - CPR WELL - SURVEYS	14,900.00	7,309.61	1,591.91	1,443.67	10.739	SF
WANDELL 32-7 - CPR WELL - GYRO	13,299.24	7,209.90	1,601.50	1,491.31	14.534	CC
WANDELL 32-7 - CPR WELL - GYRO	13,300.00	7,209.90	1,601.50	1,491.30	14.532	ES
WANDELL 32-7 - CPR WELL - GYRO	13,500.00	7,209.88	1,614.04	1,501.69	14.367	SF
WANDELL 33-7 - CPR WELL - SURVEYS	11,953.53	7,387.66	1,621.25	1,512.50	14.908	CC, ES
WANDELL 33-7 - CPR WELL - SURVEYS	12,100.00	7,386.29	1,627.86	1,517.41	14.739	SF
WANDELL 34-7 - CPR WELL - GYRO	10,469.70	7,378.03	1,682.16	1,614.09	24.711	CC
WANDELL 34-7 - CPR WELL - GYRO	10,500.00	7,378.00	1,682.43	1,613.95	24.567	ES
WANDELL 34-7 - CPR WELL - GYRO	10,800.00	7,377.73	1,714.28	1,642.62	23.921	SF
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,184.06	7,464.98	2,285.53	2,132.87	14.972	CC
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,200.00	7,464.93	2,285.58	2,132.81	14.961	ES
WANDELL 4-0-7 - CPR WELL - SURVEYS	15,227.83	7,464.85	2,285.94	2,132.98	14.945	SF
WANDELL 41-7 - CPR WELL - SURVEYS	14,758.97	7,282.49	176.40	43.45	1.327	Level 3, CC, ES, SF
WANDELL 42-7 - CPR WELL - SURVEYS	13,182.15	7,376.99	221.20	95.01	1.753	CC, ES, SF
WANDELL 43-7 - CPR WELL - SURVEYS	11,867.84	7,593.70	342.00	230.83	3.076	CC, ES
WANDELL 43-7 - CPR WELL - SURVEYS	11,900.00	7,593.77	343.51	231.14	3.057	SF
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,494.29	7,579.05	2,365.00	2,255.34	21.567	CC
WANDELL 4-4-7 - CPR WELL - SURVEYS	12,500.00	7,579.09	2,365.01	2,255.22	21.542	ES
WANDELL 4-4-7 - CPR WELL - SURVEYS	13,100.00	7,582.97	2,441.33	2,320.87	20.267	SF
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,242.64	7,599.60	2,035.14	1,931.43	19.623	CC
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,300.00	7,599.90	2,035.95	1,931.35	19.465	ES
WANDELL 4-6-7 - CPR WELL - SURVEYS	11,600.00	7,601.46	2,066.28	1,958.08	19.098	SF
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,209.71	7,286.58	1,005.60	850.05	6.465	CC
WANDELL 6-0-7 - CPR WELL - SURVEYS	15,227.83	7,286.53	1,005.76	849.97	6.456	ES, SF
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,419.90	7,597.61	944.10	821.06	7.673	CC, ES
WANDELL 6-4-7 - CPR WELL - SURVEYS	12,500.00	7,597.46	947.49	823.84	7.662	SF
WANDELL 6-8-7 - CPR WELL - SURVEYS	9,988.80	7,380.10	945.64	870.70	12.620	CC
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,000.00	7,380.15	945.70	870.66	12.603	ES
WANDELL 6-8-7 - CPR WELL - SURVEYS	10,100.00	7,380.56	952.15	876.40	12.569	SF
WANDELL 8-2-7 - CPR WELL - SURVEYS	13,870.59	7,373.05	281.85	148.00	2.106	CC, ES, SF
WANDELL 8-4-7 - CPR WELL - SURVEYS	12,660.80	7,609.06	259.76	133.59	2.059	CC, ES, SF
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	10,879.10	7,236.00	574.80	497.92	7.477	CC, ES
WANDELL E UNIT 1 - CPR WELL - NO SURVEYS	10,900.00	7,236.00	575.18	498.07	7.460	SF

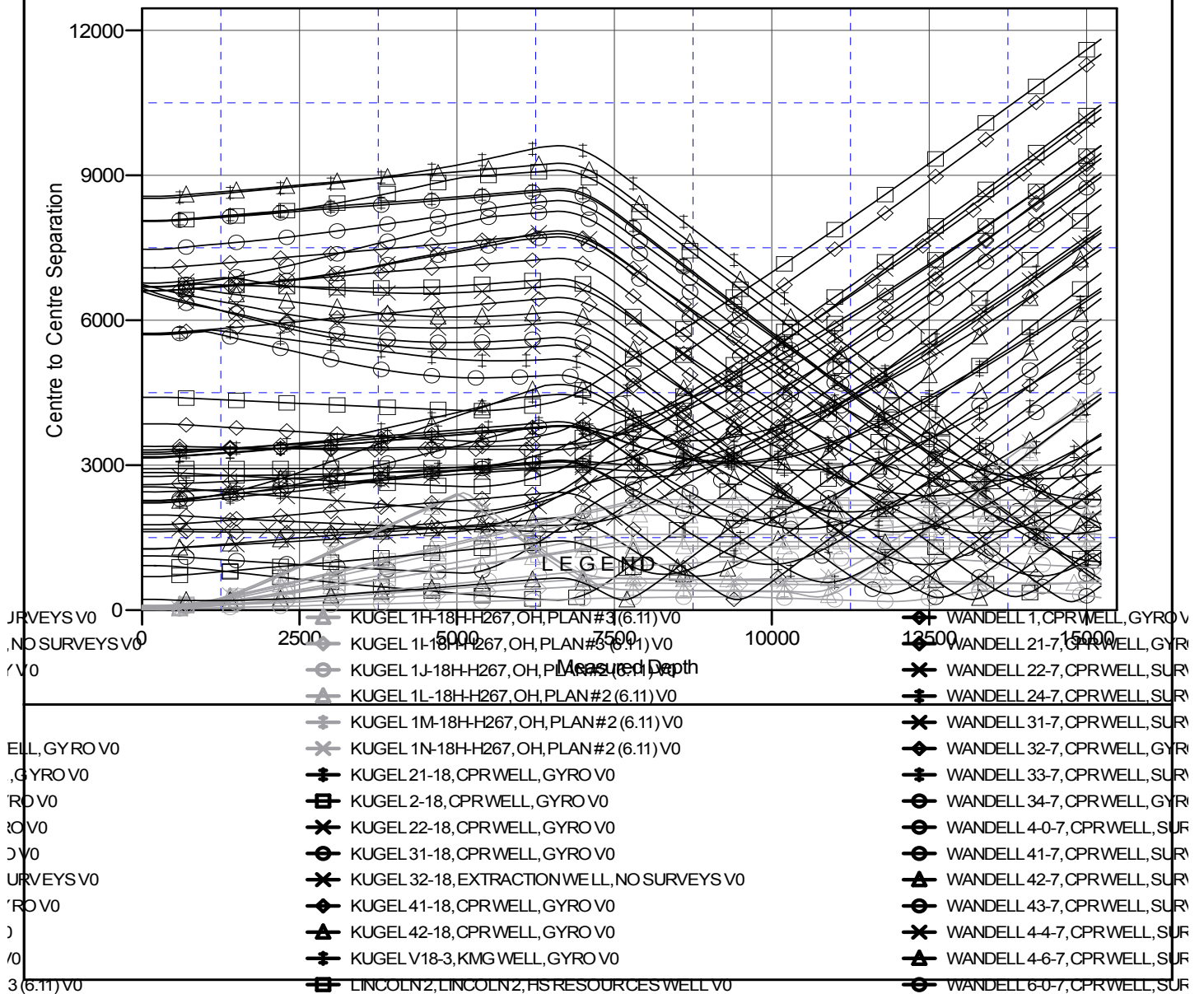
Cathedral Energy Services
Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1K-18H-H267 - Slot KUGEL 1K
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 1K-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 1K-18H-H267 - Slot KUGEL 1K
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°

Ladder Plot



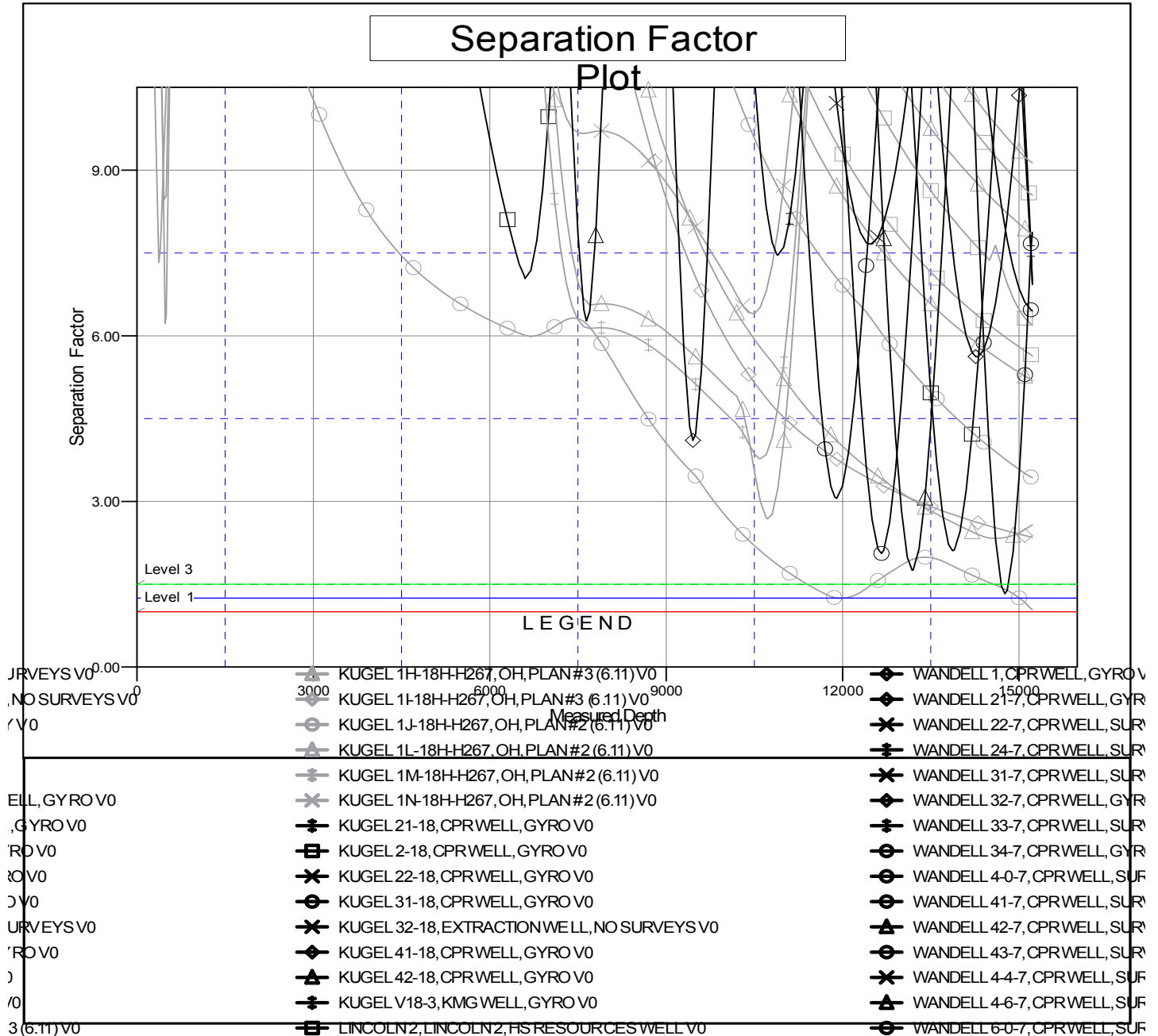
Cathedral Energy Services

Anticollision Summary Report

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well KUGEL 1K-18H-H267 - Slot KUGEL 1K
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 1K-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 1K-18H-H267 - Slot KUGEL 1K
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