

# **Crestone Peak Resources**

**DJ BASIN**

**BIGHORN**

**BIGHORN 4B-17H-P267**

**OH**

**PLAN #2**

## **Anticollision Summary Report**

**13 April, 2018**

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PLAN #2		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.00usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 2,237.05 usft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	4/13/2018		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	2,000.00	PLAN #2 (OH)	VESSI_GYROFLEX	VESSI Gyroflex Gyro
2,001.00	14,162.50	PLAN #2 (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						
BIGHORN						
BIGHORN 4A-17H-P267 - OH - PLAN #2	500.00	500.00	10.07	8.54	6.576	CC
BIGHORN 4A-17H-P267 - OH - PLAN #2	14,162.50	13,898.83	187.53	-35.29	0.842	Level 1, ES, SF
BIGHORN 4AA-17H-P267 - OH - PLAN #1	200.00	200.00	39.99	39.50	82.707	CC, ES
BIGHORN 4AA-17H-P267 - OH - PLAN #1	14,162.50	14,401.44	897.08	583.65	2.862	SF
BIGHORN 4AB-17H-P267 - OH - PLAN #2	300.00	300.00	30.20	29.37	36.275	CC, ES
BIGHORN 4AB-17H-P267 - OH - PLAN #2	14,162.50	13,909.78	860.49	557.00	2.835	SF
BIGHORN 4AC-17H-P267 - OH - PLAN #1	400.00	400.00	20.13	18.95	17.040	CC, ES
BIGHORN 4AC-17H-P267 - OH - PLAN #1	14,162.50	14,055.26	636.34	334.54	2.108	SF
BIGHORN 4C-17H-P267 - OH - PLAN #1	298.01	298.06	9.46	8.63	11.434	CC
BIGHORN 4C-17H-P267 - OH - PLAN #1	300.00	300.04	9.46	8.62	11.338	ES
BIGHORN 4C-17H-P267 - OH - PLAN #1	5,100.00	5,066.01	171.44	35.76	1.264	Level 3, SF
BIGHORN 4D-17H-P267 - OH - PLAN #2	600.00	600.00	19.85	17.97	10.561	CC, ES
BIGHORN 4D-17H-P267 - OH - PLAN #2	14,162.50	13,702.22	556.16	256.70	1.857	SF
BIGHORN 4E-17H-P267 - OH - PLAN #1	201.87	201.87	29.92	29.43	61.059	CC
BIGHORN 4E-17H-P267 - OH - PLAN #1	3,600.00	3,565.75	52.13	-11.74	0.816	Level 1, ES, SF
BIGHORN 4F-17H-P267 - OH - PLAN #1	600.00	600.00	39.98	38.10	21.271	CC, ES
BIGHORN 4F-17H-P267 - OH - PLAN #1	14,162.50	13,741.86	823.27	509.33	2.622	SF
BIGHORN 4G-17H-P267 - OH - PLAN #3	600.00	600.00	49.77	47.89	26.478	CC, ES
BIGHORN 4G-17H-P267 - OH - PLAN #3	14,162.50	13,580.81	1,142.00	829.96	3.660	SF
BIGHORN 4H-17H-P267 - OH - PLAN #1	203.81	203.81	59.84	59.34	120.451	CC
BIGHORN 4H-17H-P267 - OH - PLAN #1	300.00	299.89	59.91	59.08	71.923	ES
BIGHORN 4H-17H-P267 - OH - PLAN #1	14,162.50	13,342.81	1,321.71	1,013.37	4.286	SF
BIGHORN 4I-17H-P267 - OH - PLAN #1	1,079.29	1,084.68	55.63	52.00	15.344	CC
BIGHORN 4I-17H-P267 - OH - PLAN #1	1,100.00	1,105.31	55.65	51.95	15.041	ES
BIGHORN 4I-17H-P267 - OH - PLAN #1	14,162.50	13,423.17	1,703.46	1,388.37	5.406	SF
BIGHORN 4J-17H-P267 - OH - PLAN #3	1,437.08	1,447.41	21.65	16.68	4.351	CC, ES
BIGHORN 4J-17H-P267 - OH - PLAN #3	1,500.00	1,510.07	22.54	17.32	4.313	SF
BIGHORN 4K-17H-P267 - OH - PLAN #2	1,404.16	1,419.87	72.78	67.96	15.108	CC, ES
BIGHORN 4K-17H-P267 - OH - PLAN #2	11,400.00	10,281.19	2,234.14	2,063.54	13.096	SF
BIGHORN 4L-17H-P267 - OH - PLAN #2	612.85	614.19	99.82	97.89	51.800	CC
BIGHORN 4L-17H-P267 - OH - PLAN #2	800.00	805.94	100.16	97.56	38.621	ES
BIGHORN 4L-17H-P267 - OH - PLAN #2	11,700.00	10,500.00	2,233.56	2,051.42	12.263	SF
BIGHORN 4M-17H-P267 - OH - PLAN #1	801.86	809.58	95.83	93.18	36.242	CC, ES
BIGHORN 4M-17H-P267 - OH - PLAN #1	1,600.00	1,604.56	129.83	124.18	23.012	SF
BIGHORN 4N-17H-P267 - OH - PLAN #2	766.56	772.83	114.60	112.12	46.147	CC
BIGHORN 4N-17H-P267 - OH - PLAN #2	800.00	806.53	114.70	112.10	44.073	ES

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

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	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						
BIGHORN						
BIGHORN 4N-17H-P267 - OH - PLAN #2	6,800.00	6,369.81	2,230.30	2,154.33	29.358	SF
BIGHORN 4O-17H-P267 - OH - PLAN #2	713.39	718.79	123.32	121.02	53.642	CC, ES
BIGHORN 4O-17H-P267 - OH - PLAN #2	6,500.00	6,056.39	2,203.86	2,132.79	31.012	SF
BIGHORN 4P-17H-P267 - OH - PLAN #2	362.38	363.47	139.73	138.67	132.627	CC
BIGHORN 4P-17H-P267 - OH - PLAN #2	400.00	401.00	139.75	138.56	117.891	ES
BIGHORN 4P-17H-P267 - OH - PLAN #2	5,700.00	5,182.58	2,212.02	2,156.44	39.798	SF
BIGHORN 4Q-17H-P267 - OH - PLAN #2	400.00	401.00	149.87	148.69	126.652	CC
BIGHORN 4Q-17H-P267 - OH - PLAN #2	600.00	600.39	150.22	148.34	79.836	ES
BIGHORN 4Q-17H-P267 - OH - PLAN #2	5,600.00	5,074.72	2,223.65	2,170.68	41.979	SF
BIGHORN 4R-17H-P267 - OH - PLAN #2	300.00	301.00	159.94	159.10	191.710	CC, ES
BIGHORN 4R-17H-P267 - OH - PLAN #2	5,100.00	4,507.45	2,234.05	2,188.73	49.298	SF
BIGHORN 4S-17H-P267 - OH - PLAN #3	200.00	201.00	170.00	169.52	350.376	CC, ES
BIGHORN 4S-17H-P267 - OH - PLAN #3	4,900.00	4,294.64	2,216.47	2,178.40	58.223	SF

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<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	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						
S17-T2N-R67W (OFFSETS)						
ABBEY STATE V16-77HN - KMG WELL - SURVEYS						Out of range
ALFRED D SATER UNIT 2 - KMG WELL - GYRO						Out of range
ALVIN STATE 1 - PDC WELL - GYRO	518.89	526.90	1,612.59	1,610.96	987.470	CC
ALVIN STATE 1 - PDC WELL - GYRO	600.00	598.23	1,612.84	1,610.94	850.125	ES
ALVIN STATE 1 - PDC WELL - GYRO	2,700.00	2,577.40	2,203.42	2,192.10	194.715	SF
ASPEN STATE V16-75HN - KMG WELL - SURVEYS						Out of range
CHENG 3-8A - KMG WELL - SURVEYS						Out of range
CIRBO 4-6-5 - CPR WELL - SURVEYS						Out of range
CIRBO 6-4-5 - CPR WELL - SURVEYS						Out of range
DECHANT 2-16 - KMG WELL - GYRO						Out of range
DECHANT 6 - KPK WELL - NO SURVEYS						Out of range
DECHANT 7 - KPK WELL - NO SURVEYS	600.00	609.00	1,774.50	1,771.56	603.719	CC, ES
DECHANT 7 - KPK WELL - NO SURVEYS	2,200.00	2,114.35	2,194.61	2,183.16	191.732	SF
DECHANT 8 - GERRITY WELL - NO SURVEYS						Out of range
DECHANT STATE 1 - KPK WELL - SURVEYS						Out of range
DECHANT STATE GAS U 9 - KMG WELL - GYRO	607.85	639.88	1,949.73	1,947.76	988.982	CC, ES
DECHANT STATE GAS U 9 - KMG WELL - GYRO	2,000.00	1,998.35	2,220.15	2,213.19	319.163	SF
DECHANT STATE V 16-11JI - KMG WELL - GYRO						Out of range
DECHANT STATE V 16-12JI - KMG WELL - GYRO	654.90	686.68	1,864.75	1,862.60	868.803	CC, ES
DECHANT STATE V 16-12JI - KMG WELL - GYRO	2,100.00	2,037.71	2,210.23	2,202.82	298.090	SF
DECHANT STATE V 16-14JI - KMG WELL - GYRO						Out of range
DECHANT STATE V 16-4JI - KMG WELL - GYRO						Out of range
DECHANT STATE V 16-5JI - KMG WELL - GYRO						Out of range
DECHANT V 16-3JI - KMG WELL - GYRO						Out of range
DECHANT-STATE 2 - KPK WELL - NO SURVEYS						Out of range
DECHANT-STATE 3 - KPK WELL - NO SURVEYS	600.00	603.00	1,640.46	1,637.55	563.340	CC, ES
DECHANT-STATE 3 - KPK WELL - NO SURVEYS	2,700.00	2,549.74	2,225.82	2,209.59	137.137	SF
DECHANT-STATE 4 - KPK WELL - NO SURVEYS						Out of range
DECHANT-STATE 5 - KPK WELL - NO SURVEYS						Out of range
DIER 1 - CPR WELL - GYRO						Out of range
DIER 13-8 - CPR WELL - SURVEYS	14,162.50	6,976.47	1,457.93	1,307.36	9.683	CC, ES, SF
DIER 14-8 - CPR WELL - SURVEYS	14,162.50	7,627.21	352.77	189.82	2.165	CC, ES, SF
DIER 23-8 - CPR WELL - SURVEYS						Out of range
DIER 24-8 - CPR WELL - SURVEYS	14,162.50	7,448.67	1,323.29	1,145.56	7.445	CC, ES, SF
DIER 33-8 - CPR WELL - GYRO						Out of range
DIER 34-8 - CPR WELL - GYRO	14,162.50	7,486.35	2,211.78	2,039.72	12.855	CC, ES, SF
DIER 44-8 - CPR WELL - GYRO						Out of range
DIER 4-4-8 - CPR WELL - SURVEYS						Out of range
DIER 4-8 - CPR WELL - GYRO	14,162.50	7,436.73	1,163.27	995.97	6.953	CC, ES, SF
DIER 8-4-8 - CPR WELL - SURVEYS						Out of range
DIER 8-6-8 - CPR WELL - SURVEYS						Out of range
DIER J1A - CPR WELL - GYRO						Out of range
ELKHORN CO B 3 - KPK WELL - NO SURVEYS						Out of range
ELKHORN CO UNIT 2 - KMG WELL - GYRO						Out of range
ELKHORN CO-B 6 - KPK WELL - NO SURVEYS						Out of range
ELKHORN CO-B 7 - KPK WELL - NO SURVEYS						Out of range
ELKHORN COMPANY B 2 - KMG WELL - GYRO						Out of range
FIRESTONE 20-29D - KMG WELL - SURVEYS	7,084.56	6,335.08	136.42	2.68	1.020	Level 2, CC
FIRESTONE 20-29D - KMG WELL - SURVEYS	7,100.00	6,348.01	136.68	2.60	1.019	Level 2, ES, SF
FIRESTONE V 20-04D - KMG WELL - SURVEYS	8,067.52	7,244.94	503.31	390.77	4.472	CC
FIRESTONE V 20-04D - KMG WELL - SURVEYS	8,100.00	7,271.92	504.31	386.73	4.289	ES
FIRESTONE V 20-04D - KMG WELL - SURVEYS	8,300.00	7,428.56	556.30	412.05	3.856	SF
FIRESTONE V 20-08D - KMG WELL - SURVEYS	2,377.66	2,090.83	1,794.15	1,782.69	156.620	CC

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

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
S17-T2N-R67W (OFFSETS)						
FIRESTONE V 20-08D - KMG WELL - SURVEYS	2,500.00	2,159.46	1,796.29	1,782.04	126.056	ES
FIRESTONE V 20-08D - KMG WELL - SURVEYS	4,100.00	3,257.00	2,209.02	2,157.75	43.089	SF
FIRESTONE V 20-18D - KMG WELL - SURVEYS	5,564.28	4,835.99	1,166.28	1,074.03	12.643	CC
FIRESTONE V 20-18D - KMG WELL - SURVEYS	5,700.00	4,947.70	1,168.76	1,071.75	12.048	ES
FIRESTONE V 20-18D - KMG WELL - SURVEYS	6,100.00	5,181.44	1,230.42	1,124.54	11.621	SF
FIRESTONE V 20-2 - KMG WELL - GYRO	4,626.33	4,207.61	904.33	828.31	11.895	CC
FIRESTONE V 20-2 - KMG WELL - GYRO	4,700.00	4,273.82	905.03	827.23	11.632	ES
FIRESTONE V 20-2 - KMG WELL - GYRO	5,100.00	4,612.16	936.37	851.18	10.992	SF
FIRESTONE V 20-3 - KMG WELL - GYRO	6,749.56	6,014.79	684.44	562.07	5.593	CC
FIRESTONE V 20-3 - KMG WELL - GYRO	6,800.00	6,049.88	685.21	561.83	5.554	ES
FIRESTONE V 20-3 - KMG WELL - GYRO	6,900.00	6,123.31	691.13	566.29	5.536	SF
HOMESTEAD 22-4 - KMG WELL - SURVEYS						Out of range
HOMESTEAD 29-4 - KMG WELL - SURVEYS						Out of range
HOMESTEAD 31-4 - KMG WELL - SURVEYS						Out of range
HOMESTEAD 4-4 - KMG WELL - GYRO						Out of range
HSR-DODERO 6-4A - KMG WELL - GYRO						Out of range
HSR-MCHALE 7-5A - KMG WELL - GYRO						Out of range
HSR-RHOADES 8-5A - KMG WELL - GYRO						Out of range
HSR-SATER 1-8A - KMG WELL - GYRO						Out of range
HSR-VOGL 3-5A - KMG WELL - GYRO						Out of range
MAHONEY 1 - KPK WELL - NO SURVEYS	2,171.67	2,103.10	1,326.79	1,314.80	110.678	CC
MAHONEY 1 - KPK WELL - NO SURVEYS	2,200.00	2,121.35	1,326.90	1,314.55	107.443	ES
MAHONEY 1 - KPK WELL - NO SURVEYS	4,700.00	4,235.79	1,910.58	1,850.60	31.854	SF
MAHONEY 2 - KPK WELL - NO SURVEYS						Out of range
MAHONEY-PERRIN 2 - KPK WELL - NO SURVEYS	4,222.06	3,819.68	1,022.74	957.56	15.692	CC
MAHONEY-PERRIN 2 - KPK WELL - NO SURVEYS	4,300.00	3,885.58	1,023.58	956.33	15.221	ES
MAHONEY-PERRIN 2 - KPK WELL - NO SURVEYS	5,000.00	4,477.45	1,103.87	1,022.52	13.570	SF
MCCLAY 5-4A - KMG WELL - GYRO						Out of range
MCCOY 1 - CPR WELL - GYRO						Out of range
MCCOY 13-5 - CPR WELL - GYRO						Out of range
MCCOY 14-5 - CPR WELL - GYRO						Out of range
MCCOY 23-5 - CPR WELL - GYRO						Out of range
MCCOY 24-5 - CPR WELL - GYRO						Out of range
MCCOY 2-4-5 - CPR WELL - SURVEYS						Out of range
MCHALE 2-5 - KMG WELL - GYRO						Out of range
MCHALE UNIT 1 - KMG WELL - GYRO						Out of range
MCHALE-B 1 - AMOCO WELL - NO SURVEYS						Out of range
MERLE L MCHALE UNIT 2 - KMG WELL - GYRO						Out of range
MILLER 1 - EXTRACTION WELL - GYRO						Out of range
MILLER 11-17 - CPR WELL - SURVEYS	13,310.93	7,711.64	348.34	195.43	2.278	CC, ES, SF
MILLER 1-17 - CPR WELL - SURVEYS	12,412.73	8,401.95	793.57	679.12	6.934	CC
MILLER 1-17 - CPR WELL - SURVEYS	12,500.00	8,382.43	798.12	678.90	6.694	ES
MILLER 1-17 - CPR WELL - SURVEYS	13,500.00	13,500.00	1,320.48	1,091.17	5.759	SF
MILLER 12-17 - CPR WELL - SURVEYS	11,700.00	7,672.88	216.67	98.45	1.833	ES, SF
MILLER 12-17 - CPR WELL - SURVEYS	11,753.46	7,674.63	209.97	98.62	1.886	CC
MILLER 13-17 - CPR WELL - SURVEYS	10,500.00	7,647.57	325.55	211.66	2.858	SF
MILLER 13-17 - CPR WELL - SURVEYS	10,600.00	7,655.12	300.84	205.30	3.149	ES
MILLER 13-17 - CPR WELL - SURVEYS	10,627.84	7,657.19	299.55	207.11	3.241	CC
MILLER 14-17 - EXTRACTION WELL - NO SURVEYS	6,531.27	5,261.00	1,503.57	1,404.03	15.105	CC, ES
MILLER 14-17 - EXTRACTION WELL - NO SURVEYS	6,700.00	5,261.00	1,513.01	1,411.53	14.909	SF
MILLER 21-17 - CPR WELL - GYRO	13,328.39	7,456.53	1,052.01	903.04	7.062	CC, ES
MILLER 21-17 - CPR WELL - GYRO	13,500.00	7,456.88	1,065.91	913.17	6.979	SF
MILLER 2-17 - CPR WELL - GYRO						Out of range

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

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	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						
S17-T2N-R67W (OFFSETS)						
MILLER 22-17 - CPR WELL - SURVEYS	11,807.22	7,783.69	1,143.69	1,014.97	8.885	CC, ES
MILLER 22-17 - CPR WELL - SURVEYS	12,100.00	7,743.81	1,179.94	1,041.70	8.535	SF
MILLER 23-17 - CPR WELL - SURVEYS	10,592.29	7,721.31	1,156.72	1,058.96	11.832	CC
MILLER 23-17 - CPR WELL - SURVEYS	10,700.00	7,730.55	1,161.70	1,056.85	11.079	ES
MILLER 23-17 - CPR WELL - SURVEYS	11,300.00	7,770.97	1,355.15	1,210.85	9.391	SF
MILLER 24-17 - CPR WELL - GYRO	5,589.75	4,983.83	819.33	726.28	8.806	CC
MILLER 24-17 - CPR WELL - GYRO	5,700.00	5,079.53	821.12	725.47	8.585	ES
MILLER 24-17 - CPR WELL - GYRO	6,000.00	5,337.63	844.62	743.89	8.385	SF
MILLER 2-4-17 - CPR WELL - SURVEYS	11,129.14	7,696.97	404.76	295.15	3.693	CC
MILLER 2-4-17 - CPR WELL - SURVEYS	11,200.00	7,696.72	410.92	293.41	3.497	ES
MILLER 2-4-17 - CPR WELL - SURVEYS	11,300.00	7,696.38	439.35	308.56	3.359	SF
MILLER 31-17C - EXTRACTION WELL - GYRO						Out of range
MILLER 3-17J - CPR WELL - GYRO	1,065.34	1,046.22	541.46	537.94	153.810	CC
MILLER 3-17J - CPR WELL - GYRO	1,100.00	1,080.44	541.49	537.85	148.648	ES
MILLER 3-17J - CPR WELL - GYRO	3,200.00	2,957.15	931.94	909.25	41.064	SF
MILLER 32-17 - EXTRACTION WELL - GYRO	100.00	49.84	2,205.02	2,204.91	10,000.000	CC, ES
MILLER 32-17 - EXTRACTION WELL - GYRO	1,100.00	1,026.70	2,227.49	2,223.94	627.692	SF
MILLER 33-17J - CPR WELL - SURVEYS	2,669.16	2,508.95	199.46	179.97	10.236	CC
MILLER 33-17J - CPR WELL - SURVEYS	2,700.00	2,535.62	200.08	179.86	9.894	ES
MILLER 33-17J - CPR WELL - SURVEYS	2,800.00	2,616.12	211.53	189.58	9.638	SF
MILLER 34-17J - CPR WELL - SURVEYS	2,451.60	2,328.42	148.15	134.05	10.509	CC, ES
MILLER 34-17J - CPR WELL - SURVEYS	2,500.00	2,369.56	150.34	135.27	9.972	SF
MILLER 41-17 - EXTRACTION WELL - GYRO						Out of range
MILLER 4-17J - CPR WELL - GYRO	9,200.00	7,496.05	195.13	53.30	1.376	Level 3, SF
MILLER 4-17J - CPR WELL - GYRO	9,300.00	7,496.01	135.24	37.20	1.379	Level 3, ES
MILLER 4-17J - CPR WELL - GYRO	9,348.93	7,495.98	126.07	64.84	2.059	CC
MILLER 42-17 - EXTRACTION WELL - NO SURVEYS						Out of range
MILLER 43-17 - EXTRACTION WELL - GYRO	496.40	479.41	1,084.22	1,082.70	711.679	CC
MILLER 43-17 - EXTRACTION WELL - GYRO	604.62	589.07	1,084.27	1,082.36	568.855	ES
MILLER 43-17 - EXTRACTION WELL - GYRO	4,000.00	3,665.72	2,201.62	2,173.42	78.083	SF
MILLER 43-17J - EXTRACTION WELL - GYRO	611.41	603.70	1,062.29	1,060.34	546.476	CC, ES
MILLER 43-17J - EXTRACTION WELL - GYRO	4,200.00	3,884.61	2,223.06	2,191.55	70.562	SF
MILLER 44-17J - CPR WELL - SURVEYS	2,306.50	2,206.90	148.19	137.40	13.737	CC, ES
MILLER 44-17J - CPR WELL - SURVEYS	2,400.00	2,284.82	156.88	144.43	12.603	SF
MILLER CJ 17-A - CPR WELL - SURVEYS	9,882.91	7,496.47	571.66	491.62	7.141	CC
MILLER CJ 17-A - CPR WELL - SURVEYS	10,000.00	7,500.44	583.52	486.51	6.015	ES
MILLER CJ 17-A - CPR WELL - SURVEYS	10,300.00	7,510.82	707.51	571.35	5.196	SF
PACE 1 - GO PUMPING & CONS WELL - NO SURVEYS	2,364.41	2,250.99	118.68	102.82	7.483	CC, ES
PACE 1 - GO PUMPING & CONS WELL - NO SURVEYS	2,400.00	2,281.08	120.19	103.54	7.218	SF
PACE 2 - TEXAS TEA WELL - NO SURVEYS	2,239.66	2,133.35	1,240.59	1,227.53	94.968	CC
PACE 2 - TEXAS TEA WELL - NO SURVEYS	2,400.00	2,269.08	1,242.85	1,226.21	74.686	ES
PACE 2 - TEXAS TEA WELL - NO SURVEYS	4,500.00	4,044.69	1,722.94	1,666.09	30.309	SF
PACE 3 - DENVER EAST MACHINERY WELL - NO SUR	600.00	609.00	450.59	447.67	153.883	CC, ES
PACE 3 - DENVER EAST MACHINERY WELL - NO SUR	2,100.00	2,027.48	738.50	727.45	66.816	SF
PERRIN GU 1 - KMG WELL - GYRO	2,955.21	2,816.21	1,719.26	1,692.95	65.344	CC
PERRIN GU 1 - KMG WELL - GYRO	3,100.00	2,950.18	1,720.48	1,690.58	57.538	ES
PERRIN GU 1 - KMG WELL - GYRO	5,500.00	4,939.25	2,196.19	2,123.69	30.291	SF
PERRIN GU 2-20 - KMG WELL - GYRO	7,730.13	6,814.45	1,357.77	1,210.64	9.229	CC, ES
PERRIN GU 2-20 - KMG WELL - GYRO	7,900.00	6,962.57	1,379.61	1,228.13	9.108	SF
PERRIN V 20-5D - KMG WELL - GYRO	7,987.02	7,002.09	1,608.34	1,494.77	14.163	CC
PERRIN V 20-5D - KMG WELL - GYRO	8,000.00	7,012.72	1,608.46	1,494.15	14.071	ES
PERRIN V 20-5D - KMG WELL - GYRO	8,400.00	7,298.04	1,735.05	1,599.45	12.795	SF
PERRIN V 20-7DI - KMG WELL - GYRO						Out of range

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

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	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						
S17-T2N-R67W (OFFSETS)						
PERRIN-MAHONEY 1 - KPK WELL - NO SURVEYS						Out of range
PROMINENCE 4-8 - KMG WELL - GYRO						Out of range
RHOADES 1-5A - KMG WELL - GYRO						Out of range
ROBERT E BALDWIN 2 - KMG WELL - GYRO						Out of range
RUCA 20-1HZ - KMG - PLAN ONLY	4,400.00	4,494.13	301.02	244.68	5.344	SF
RUCA 20-1HZ - KMG - PLAN ONLY	4,477.84	4,561.64	298.51	244.00	5.476	CC, ES
RUCA 20-2HZ - KMG - PLAN ONLY	4,198.41	4,302.01	473.20	420.23	8.933	CC, ES, SF
RUCA 20-3HZ - KMG - PLAN ONLY	4,031.57	4,168.56	564.72	514.31	11.203	CC, ES, SF
RUCA 20-4HZ - KMG - PLAN ONLY	3,735.22	3,885.82	655.86	609.30	14.087	CC, ES
RUCA 20-4HZ - KMG - PLAN ONLY	3,900.00	4,021.70	662.45	614.86	13.920	SF
RUCA 20-5HZ - KMG - PLAN ONLY	3,481.50	3,656.92	754.17	711.84	17.818	CC
RUCA 20-5HZ - KMG - PLAN ONLY	3,500.00	3,671.80	754.25	711.67	17.715	ES
RUCA 20-5HZ - KMG - PLAN ONLY	3,700.00	3,832.62	765.27	720.58	17.123	SF
RUCA 20-6HZ - KMG - PLAN ONLY	3,359.54	3,550.63	903.30	863.28	22.568	CC
RUCA 20-6HZ - KMG - PLAN ONLY	3,400.00	3,582.59	903.64	862.96	22.215	ES
RUCA 20-6HZ - KMG - PLAN ONLY	3,800.00	3,901.46	942.82	897.63	20.860	SF
RUCA 20-7HZ - KMG - PLAN ONLY	2,879.87	3,087.82	1,026.53	995.97	33.588	CC
RUCA 20-7HZ - KMG - PLAN ONLY	2,900.00	3,102.91	1,026.62	995.62	33.114	ES
RUCA 20-7HZ - KMG - PLAN ONLY	3,500.00	3,552.56	1,105.60	1,064.80	27.098	SF
RUCA 20-8HZ - KMG - PLAN ONLY	2,619.02	2,857.83	1,121.99	1,097.01	44.927	CC
RUCA 20-8HZ - KMG - PLAN ONLY	2,700.00	2,914.89	1,123.46	1,096.59	41.812	ES
RUCA 20-8HZ - KMG - PLAN ONLY	3,400.00	3,408.09	1,251.40	1,212.48	32.157	SF
RUCA 20-9HZ - KMG - PLAN ONLY	2,443.90	2,684.43	1,212.29	1,191.27	57.665	CC
RUCA 20-9HZ - KMG - PLAN ONLY	2,500.00	2,722.49	1,212.99	1,190.63	54.234	ES
RUCA 20-9HZ - KMG - PLAN ONLY	3,400.00	3,333.15	1,401.05	1,362.35	36.206	SF
SATER 21-8 - KMG WELL - SURVEYS						Out of range
SATER 24-8 - KMG WELL - SURVEYS						Out of range
SATER 24C-5HZ - KMG WELL - SURVEYS						Out of range
SATER 24N-5HZ - KMG WELL - SURVEYS						Out of range
SATER 25C-5HZ - KMG WELL - SURVEYS						Out of range
SATER 2-8 - KMG WELL - SURVEYS						Out of range
SATER 28-8 - KMG WELL - SURVEYS						Out of range
SATER 40N-5HZ - KMG WELL - SURVEYS						Out of range
SATER 7-8 - KMG WELL - SURVEYS						Out of range
SATER 8-8 - KMG WELL - SURVEYS						Out of range
SATER ALFRED D UNIT 1 (P&A) - KMG WELL - GYRO						Out of range
SCOTT 1C-32HZ - KMG WELL - SURVEYS						Out of range
SCOTT 26N-32HZ - KMG WELL - SURVEYS						Out of range
SCOTT 27N-32HZ - KMG WELL - SURVEYS						Out of range
SCOTT 28C-32HZ - KMG WELL - SURVEYS						Out of range
SHELEY 1 - CPR WELL - GYRO						Out of range
SHELEY 14-4 - CPR WELL - GYRO						Out of range
SHELEY 24-4 - MACHII-ROSS WELL - GYRO						Out of range
SHELEY 3A-4H - CPR WELL - SURVEYS						Out of range
SHELEY 3B-4H - CPR WELL - SURVEYS						Out of range
SHELEY 4-6-4 - CPR WELL - SURVEYS						Out of range
SPRAGUE 11-9 - CPR WELL - GYRO						Out of range
SPRAGUE 13-9 - CPR WELL - GYRO						Out of range
SPRAGUE 14-9 - CPR WELL - GYRO						Out of range
SPRAGUE 24-9 - CPR WELL - GYRO						Out of range
SPRAGUE 2-4-9 - CPR WELL - SURVEYS						Out of range
SPRAGUE 2-8-9 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3A-9H-N267 - CPR WELL - SURVEYS						Out of range

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

# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	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						
S17-T2N-R67W (OFFSETS)						
SPRAGUE 3AA-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3B-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3C-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3D-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3E-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3E-9HX1-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3F-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3G-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3H-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3I-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 3J-9H-N267 - CPR WELL - SURVEYS						Out of range
SPRAGUE 4-6-9 - CPR WELL - SURVEYS						Out of range
SPRAGUE 4-8-9 - CPR WELL - SURVEYS						Out of range
STANLEY #2 - GERRITY WELL - NO SURVEYS	600.00	637.00	1,555.15	1,552.12	513.172	CC, ES
STANLEY #2 - GERRITY WELL - NO SURVEYS	2,900.00	2,752.84	2,235.85	2,217.39	121.148	SF
STANLEY 3 - GERRITY WELL - NO SURVEYS						Out of range
TEETS PERRIN 1 - KPK WELL - NO SURVEYS	7,925.83	6,977.91	1,710.06	1,570.11	12.219	CC, ES
TEETS PERRIN 1 - KPK WELL - NO SURVEYS	8,200.00	7,200.09	1,766.93	1,614.12	11.563	SF
TEETS-PERRIN 2 - KPK WELL - NO SURVEYS	5,983.92	5,100.00	705.72	609.57	7.340	CC
TEETS-PERRIN 2 - KPK WELL - NO SURVEYS	6,000.00	5,100.00	705.90	609.54	7.326	ES, SF
TEETS-PERRIN 3 - KPK WELL - NO SURVEYS	6,597.39	5,060.00	1,465.69	1,424.89	35.924	CC, ES
TEETS-PERRIN 3 - KPK WELL - NO SURVEYS	6,600.00	5,060.00	1,465.69	1,424.89	35.924	SF
TEETS-PERRIN 4 - KPK WELL - NO SURVEYS	6,177.06	5,050.00	2,000.38	1,892.67	18.571	CC
TEETS-PERRIN 4 - KPK WELL - NO SURVEYS	6,200.00	5,050.00	2,000.51	1,892.33	18.493	ES
TEETS-PERRIN 4 - KPK WELL - NO SURVEYS	6,600.00	5,050.00	2,044.60	1,930.54	17.925	SF
TEETS-PERRIN 5 - KPK WELL - NO SURVEYS	5,555.15	4,711.00	793.20	707.23	9.226	CC, ES
TEETS-PERRIN 5 - KPK WELL - NO SURVEYS	5,600.00	4,711.00	794.47	707.93	9.180	SF
TOWNSEND 33-5 - CPR WELL - GYRO						Out of range
TOWNSEND 34-5 - CPR WELL - GYRO						Out of range
TOWNSEND 43-5 - CPR WELL - GYRO						Out of range
TOWNSEND 44-5 - CPR WELL - GYRO						Out of range
VOGL 21-5 - KMG WELL - SURVEYS						Out of range
VOGL 21-5X - KMG WELL - SURVEYS						Out of range
VOGL 5-5 - KMG WELL - GYRO						Out of range
VOGL 5-8A - KMG WELL - GYRO						Out of range
VOGL 6-5A - KMG WELL - GYRO						Out of range
VOGL GEIST 2A-5H-E267 - CPR WELL - SURVEYS						Out of range
VOGL GEIST 2B-5H-E267 - CPR WELL - SURVEYS						Out of range
VOGL GEIST 2C-5H-E267 - CPR WELL - SURVEYS						Out of range
VOGL GEIST 2D-5H-F267 - CPR WELL - SURVEYS						Out of range
VOGL GEIST 2E-5H-F267 - CPR WELL - SURVEYS						Out of range
VOGL GEIST 2F-5H-F267 - CPR WELL - SURVEYS						Out of range
VOGL MCCOY 2A-5H-E267 - CPR WELL - SURVEYS	14,162.50	14,819.00	642.97	366.19	2.323	CC, ES, SF
VOGL MCCOY 2B-5H-E267 - CPR WELL - SURVEYS	14,162.50	14,846.00	318.98	62.05	1.242	Level 2, CC, ES, SF
VOGL MCCOY 2C-5H-E267 - CPR WELL - SURVEYS	14,162.50	14,648.00	323.29	144.99	1.813	CC, ES, SF
VOGL MCCOY 2D-5H-E267 - CPR WELL - SURVEYS	14,162.50	15,056.00	513.18	215.85	1.726	CC, ES, SF
VOGL MCCOY 2E-5H-F267 - CPR WELL - SURVEYS	14,162.50	14,740.00	807.58	519.86	2.807	CC, ES, SF
VOGL MCCOY 2F-5H-F267 - CPR WELL - SURVEYS	14,162.50	15,187.00	1,095.82	794.82	3.641	CC, ES, SF
VOGL MCCOY 2G-5H-F267 - CPR WELL - SURVEYS	14,162.50	14,805.00	1,452.26	1,154.66	4.880	CC, ES, SF
VOGL MCCOY 2H-5H-F267 - CPR WELL - SURVEYS	14,162.50	15,000.00	1,792.29	1,491.17	5.952	CC, ES, SF

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

# Cathedral Energy Services

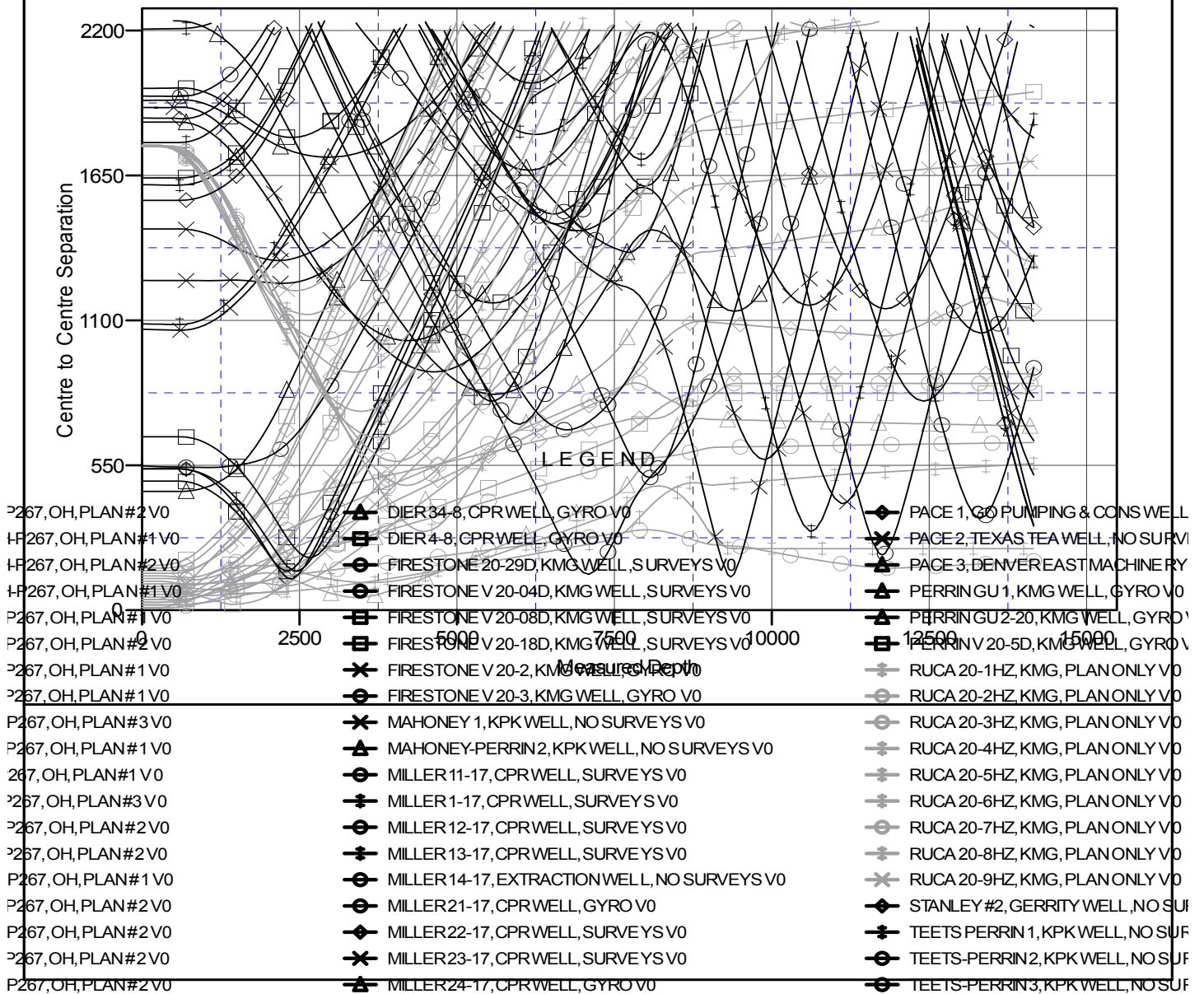
## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to 23' KB @ 4982.00usft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: BIGHORN 4B-17H-P267  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.38°

### Ladder Plot



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

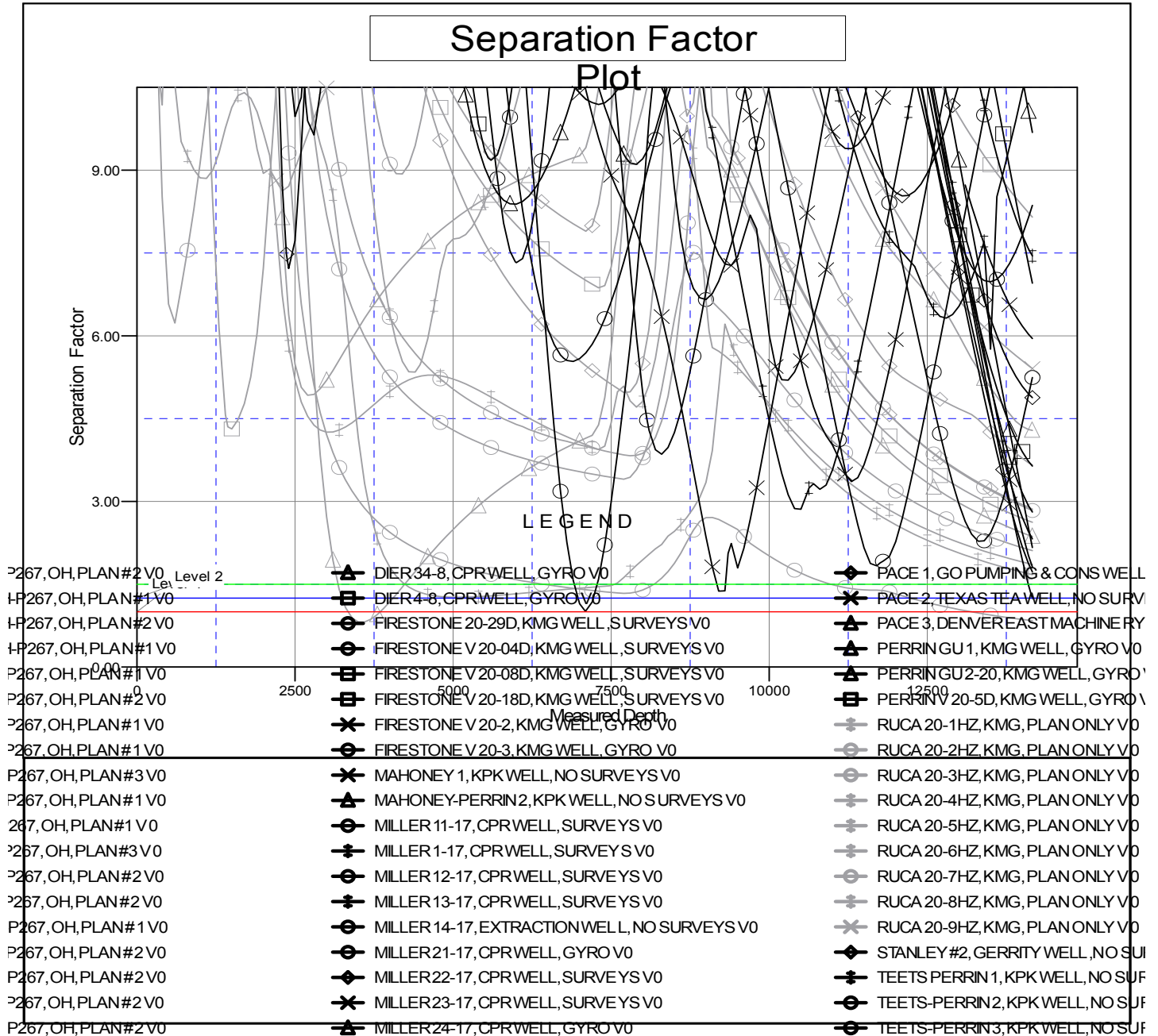
# Cathedral Energy Services

## Anticollision Summary Report

<b>Company:</b>	Crestone Peak Resources	<b>Local Co-ordinate Reference:</b>	Well BIGHORN 4B-17H-P267
<b>Project:</b>	DJ BASIN	<b>TVD Reference:</b>	23' KB @ 4982.00usft
<b>Reference Site:</b>	BIGHORN	<b>MD Reference:</b>	23' KB @ 4982.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	BIGHORN 4B-17H-P267	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #2	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to 23' KB @ 4982.00usft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: BIGHORN 4B-17H-P267  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.38°



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