

Results of Directional Survey

API number:	30-005-29139		
OGRID:		Operator:	CIMAREX ENERGY CO. OF COLORADO
		Property:	FRANKLIN 18 FEDERAL COM # 3H

surface	ULSTR:	B	18	T 15S	R 31E
				330 FNL	2270 FEL

BH Loc	ULSTR:	O	18	T 15S	R 31E
13227 MD		8711.0	TVD	4957 FNL	2248 FEL

Top Perf/OH	ULSTR:	B	18	T 15S	R 31E
8230 MD		8229.7	TVD	299 FNL	2254 FEL

Bot Perf/OH	ULSTR:	O	18	T 15S	R 31E
13227 MD		8711.0	TVD	4957 FNL	2248 FEL

	MD	N/S	E/W	VD
	8188.5	30.56	14.89	8188.21
TOP PERFS/OH	8230	30.80	15.63	8229.70
	8283.6	31.12	16.59	8283.29
	13117	-4517.45	15.68	8709.57
BOT PERFS/OH	13227	-4627.28	21.53	8711.02
	13168	-4568.37	18.39	8710.24

NEXT TO LAST	13117	-4517.45	15.68	8709.57
LAST READING	13168	-4568.37	18.39	8710.24
TD	13227	-4627.28	21.53	8711.02

Surface Location	330 FN	2270 FE
Projected BHL	4957 FN	2248 FE
Location of		
Top Perfs/OH	299 FN	2254 FE
Bottom Perfs/OH	4957 FN	2248 FE

SUMMARY of Subsurface Locations

Surface Location	B-18-15S-31E	330 FN	2270 FE	Vert. Depth
Top Perfs/OH	B-18-15S-31E	299 FN	2254 FE	8229.70
Bottom Perfs/OH	O-18-15S-31E	4957 FN	2248 FE	8711.02
Projected iD	O-18-15S-31E	4957 FN	2248 FE	8711.02

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SUR: B -18-15s-31e, 330/N & 2270/E
 BHL; O-18-15s-31e, 4957/N & 2248/E
 API # 30-005-29139



Job Number: 1010364
 Company: Chesapeake Operating Inc.
 Lease/Well: Perseus 10 Federal Com #3H
 Location: Chavez County
 Rig Name: Western Rig #6
 RKB: 17'
 G.L. or M.S.L.: GL - 4404' X - 663124.3 Y - 739618.4

State/Country: New Mexico, USA
 Declination: 7.86647
 Grid: -0.27
 File name: C:\101036-1\PEF3H.SVY
 Date/Time: 21-Jul-10 / 08:53
 Curve Name: Perseus 10 Federal Com # 3H Surveys

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Perseus 10 Federal Com # 3H Surveys

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 269.50
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
Gyro Tie In point									
8200.00	2.84	101.42	8199.33	-11.92	-3.54	3.65	12.43	196.56	.00
First Nevis MWD Surveys									
8305.00	4.10	95.10	8304.13	-12.77	2.75	-2.63	13.06	167.86	1.25
8336.00	3.60	97.50	8335.06	-12.99	4.81	-4.70	13.85	159.67	1.69
8366.00	1.80	104.10	8365.03	-13.23	6.21	-6.09	14.61	154.87	6.08
8397.00	2.40	255.50	8396.02	-13.51	6.05	-5.93	14.80	155.88	13.14
8428.00	6.60	263.50	8426.92	-13.87	3.65	-3.53	14.35	165.26	13.67
8460.00	11.70	267.30	8458.50	-14.24	-1.42	1.55	14.31	185.71	16.04
8491.00	16.90	269.00	8488.53	-14.46	-9.07	9.20	17.07	212.10	16.83
8523.00	21.80	268.80	8518.71	-14.67	-19.67	19.80	24.54	233.29	15.31
8553.00	26.50	269.40	8546.08	-14.86	-31.94	32.07	35.22	245.06	15.69
8585.00	30.60	270.00	8574.18	-14.93	-47.23	47.36	49.53	252.46	12.84
8617.00	34.70	271.50	8601.12	-14.69	-64.49	64.61	66.14	257.17	13.06
8648.00	38.80	271.40	8625.95	-14.22	-83.02	83.15	84.23	260.28	13.23
8680.00	42.80	272.00	8650.17	-13.60	-103.92	104.04	104.81	262.54	12.56
8711.00	46.70	272.70	8672.18	-12.70	-125.72	125.83	126.36	264.23	12.68
Hard Line Crossing//Interpolated Point									
8718.00	47.58	272.75	8676.95	-12.46	-130.85	130.95	131.44	264.56	12.59
8742.00	50.60	272.90	8692.66	-11.56	-148.96	149.06	149.41	265.56	12.59
8772.00	53.80	273.40	8711.05	-10.26	-172.63	172.71	172.93	266.60	10.75
8804.00	56.90	272.90	8729.24	-8.81	-198.91	198.98	199.10	267.46	9.77
8835.00	60.20	272.00	8745.41	-7.69	-225.33	225.38	225.46	268.05	10.93

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
				FT	FT	FT	Distance FT	Direction Deg	
8865.00	63.50	270.00	8759.56	-7.23	-251.77	251.82	251.87	268.35	12.47
8897.00	68.00	268.20	8772.70	-7.70	-280.93	280.99	281.04	268.43	14.97
8928.00	73.40	267.00	8782.95	-8.93	-310.15	310.22	310.28	268.35	17.80
8959.00	79.80	266.60	8790.13	-10.61	-340.24	340.32	340.41	268.21	20.68
8993.00	87.20	267.00	8793.97	-12.50	-373.95	374.04	374.16	268.09	21.80
9023.00	90.00	267.00	8794.71	-14.06	-403.90	404.00	404.14	268.01	9.33
9053.00	90.00	266.90	8794.71	-15.66	-433.85	433.97	434.14	267.93	.33
9148.00	89.30	268.60	8795.29	-19.39	-528.78	528.92	529.13	267.90	1.94
9242.00	89.30	270.00	8796.43	-20.54	-622.76	622.91	623.10	268.11	1.49
9335.00	89.80	271.10	8797.16	-19.65	-715.75	715.89	716.02	268.43	1.30
9426.00	90.70	272.40	8796.77	-16.87	-806.70	806.82	806.88	268.80	1.74
9521.00	91.10	271.80	8795.28	-13.39	-901.63	901.71	901.73	269.15	.76
9614.00	91.60	271.70	8793.08	-10.55	-994.56	994.61	994.61	269.39	.55
9704.00	91.60	271.50	8790.57	-8.04	-1084.49	1084.52	1084.52	269.58	.22
9792.00	91.30	271.50	8788.34	-5.73	-1172.43	1172.44	1172.44	269.72	.34
9887.00	91.00	271.10	8786.44	-3.58	-1267.39	1267.37	1267.39	269.84	.53
9979.00	90.90	271.00	8784.91	-1.89	-1359.36	1359.32	1359.36	269.92	.15
10074.00	90.50	270.90	8783.75	-.32	-1454.34	1454.28	1454.34	269.99	.43
10168.00	90.30	270.70	8783.10	1.00	-1548.33	1548.26	1548.33	270.04	.30
10263.00	90.00	270.20	8782.85	1.74	-1643.32	1643.24	1643.32	270.06	.61
10357.00	89.60	270.00	8783.18	1.91	-1737.32	1737.24	1737.32	270.06	.48
10452.00	90.80	269.40	8782.84	1.41	-1832.32	1832.24	1832.32	270.04	1.41
10545.00	90.70	269.30	8781.63	.35	-1925.30	1925.23	1925.30	270.01	.15
10640.00	92.30	270.10	8779.14	-.14	-2020.27	2020.19	2020.27	270.00	1.88
10735.00	92.70	270.10	8775.00	.02	-2115.17	2115.09	2115.17	270.00	.42
10829.00	92.80	270.20	8770.49	.27	-2209.07	2208.98	2209.07	270.01	.15
10924.00	91.40	270.30	8767.00	.68	-2304.00	2303.91	2304.00	270.02	1.48
11018.00	91.20	269.80	8764.87	.76	-2397.97	2397.88	2397.97	270.02	.57
11113.00	91.10	269.70	8762.97	.35	-2492.95	2492.86	2492.95	270.01	.15
11205.00	90.40	269.10	8761.76	-.61	-2584.94	2584.85	2584.94	269.99	1.00
11297.00	90.00	268.30	8761.44	-2.70	-2676.92	2676.84	2676.92	269.94	.97
11391.00	89.80	268.30	8761.60	-5.49	-2770.87	2770.82	2770.88	269.89	.21
11486.00	89.80	267.70	8761.94	-8.81	-2865.81	2865.78	2865.83	269.82	.63
11581.00	89.90	267.70	8762.18	-12.62	-2960.74	2960.74	2960.77	269.76	.11
11676.00	90.30	267.40	8762.02	-16.68	-3055.65	3055.68	3055.70	269.69	.53
11770.00	89.80	267.20	8761.94	-21.11	-3149.55	3149.61	3149.62	269.62	.57
11864.00	89.90	267.20	8762.18	-25.70	-3243.43	3243.53	3243.54	269.55	.11
11958.00	89.90	267.20	8762.35	-30.29	-3337.32	3337.46	3337.46	269.48	.00
12053.00	89.90	266.70	8762.51	-35.35	-3432.19	3432.36	3432.37	269.41	.53
12148.00	89.20	267.80	8763.26	-39.90	-3527.07	3527.29	3527.30	269.35	1.37
12243.00	90.10	268.00	8763.84	-43.38	-3622.01	3622.25	3622.27	269.31	.97
12338.00	91.90	267.80	8762.18	-46.86	-3716.92	3717.19	3717.22	269.28	1.91
12431.00	93.00	267.80	8758.21	-50.43	-3809.77	3810.06	3810.10	269.24	1.18
12525.00	93.10	268.50	8753.20	-53.46	-3903.59	3903.90	3903.95	269.22	.75
12618.00	91.20	269.30	8749.72	-55.25	-3996.50	3996.83	3996.88	269.21	2.22

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
12713.00	91.40	269.10	8747.56	-56.57	-4091.46	4091.80	4091.86	269.21	.30
12807.00	90.60	270.60	8745.92	-56.82	-4185.45	4185.78	4185.83	269.22	1.81
12902.00	89.60	271.20	8745.75	-55.32	-4280.43	4280.75	4280.79	269.26	1.23
12997.00	90.10	271.50	8746.00	-53.09	-4375.41	4375.70	4375.73	269.30	.61
13090.00	91.20	271.80	8744.95	-50.41	-4468.36	4468.63	4468.64	269.35	1.23
13183.00	90.00	271.50	8743.97	-47.73	-4561.31	4561.56	4561.56	269.40	1.33
13277.00	90.40	271.60	8743.65	-45.19	-4655.28	4655.50	4655.50	269.44	.44
Last nevis MWD Surveys									
13305.00	90.10	271.60	8743.52	-44.41	-4683.27	4683.48	4683.48	269.46	1.07
Projection to TD									
13360.00	90.10	271.60	8743.43	-42.87	-4738.25	4738.44	4738.44	269.48	.00

Job Number: 1010364 State/Country: New Mexico, USA
 Company: Chesapeake Operating Inc. Declination: 7.86647
 Lease/Well: Perseus 10 Federal Com #3H Grid: -0.27
 Location: Chavez County File name: C:\101036~1\PEF3H.SVY
 Rig Name: Western Rig #6 Date/Time: 21-Jul-10 / 09:37
 RKB: 17' Curve Name: Perseus 10 Federal Com # 3H Surveys
 G.L. or M.S.L.: GL - 4404' X - 663124.3 Y - 739618.4

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WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 269.50
 Vertical Section Referenced to offset from Wellhead: EW =.00 Ft , NS=.00 Ft
 Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TRUE Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
8200	2.84	101.42	8199.33	-11.92	-3.54	3.65	12.43	196.56	0
8305	4.1	95.1	8304.13	-12.77	2.75	-2.63	13.06	167.86	1.25
8336	3.6	97.5	8335.06	-12.99	4.81	-4.7	13.85	159.67	1.69
8366	1.8	104.1	8365.03	-13.23	6.21	-6.09	14.61	154.87	6.08
8397	2.4	255.5	8396.02	-13.51	6.05	-5.93	14.8	155.88	13.14
8428	6.6	263.5	8426.92	-13.87	3.65	-3.53	14.35	165.26	13.67
8460	11.7	267.3	8458.5	-14.24	-1.42	1.55	14.31	185.71	16.04
8491	16.9	269	8488.53	-14.46	-9.07	9.2	17.07	212.1	16.83
8523	21.8	268.8	8518.71	-14.67	-19.67	19.8	24.54	233.29	15.31
8553	26.5	269.4	8546.08	-14.86	-31.94	32.07	35.22	245.06	15.69

8585	30.6	270	8574.18	-14.93	-47.23	47.36	49.53	252.46	12.84
8617	34.7	271.5	8601.12	-14.69	-64.49	64.61	66.14	257.17	13.06
8648	38.8	271.4	8625.95	-14.22	-83.02	83.15	84.23	260.28	13.23
8680	42.8	272	8650.17	-13.6	-103.92	104.04	104.81	262.54	12.56
8711	46.7	272.7	8672.18	-12.7	-125.72	125.83	126.36	264.23	12.68
8718	47.58	272.75	8676.95	-12.46	-130.85	130.95	131.44	264.56	12.59
8742	50.6	272.9	8692.66	-11.56	-148.96	149.06	149.41	265.56	12.59
8772	53.8	273.4	8711.05	-10.26	-172.63	172.71	172.93	266.6	10.75
8804	56.9	272.9	8729.24	-8.81	-198.91	198.98	199.1	267.46	9.77
8835	60.2	272	8745.41	-7.69	-225.33	225.38	225.46	268.05	10.93
8865	63.5	270	8759.56	-7.23	-251.77	251.82	251.87	268.35	12.47
8897	68	268.2	8772.7	-7.7	-280.93	280.99	281.04	268.43	14.97
8928	73.4	267	8782.95	-8.93	-310.15	310.22	310.28	268.35	17.8
8959	79.8	266.6	8790.13	-10.61	-340.24	340.32	340.41	268.21	20.68
8993	87.2	267	8793.97	-12.5	-373.95	374.04	374.16	268.09	21.8
9023	90	267	8794.71	-14.06	-403.9	404	404.14	268.01	9.33
9053	90	266.9	8794.71	-15.66	-433.85	433.97	434.14	267.93	0.33
9148	89.3	268.6	8795.29	-19.39	-528.78	528.92	529.13	267.9	1.94
9242	89.3	270	8796.43	-20.54	-622.76	622.91	623.1	268.11	1.49
9335	89.8	271.1	8797.16	-19.65	-715.75	715.89	716.02	268.43	1.3
9426	90.7	272.4	8796.77	-16.87	-806.7	806.82	806.88	268.8	1.74
9521	91.1	271.8	8795.28	-13.39	-901.63	901.71	901.73	269.15	0.76
9614	91.6	271.7	8793.08	-10.55	-994.56	994.61	994.61	269.39	0.55
9704	91.6	271.5	8790.57	-8.04	-1084.49	1084.52	1084.52	269.58	0.22
9792	91.3	271.5	8788.34	-5.73	-1172.43	1172.44	1172.44	269.72	0.34
9887	91	271.1	8786.44	-3.58	-1267.39	1267.37	1267.39	269.84	0.53
9979	90.9	271	8784.91	-1.89	-1359.36	1359.32	1359.36	269.92	0.15
10074	90.5	270.9	8783.75	-0.32	-1454.34	1454.28	1454.34	269.99	0.43
10168	90.3	270.7	8783.1	1	-1548.33	1548.26	1548.33	270.04	0.3
10263	90	270.2	8782.85	1.74	-1643.32	1643.24	1643.32	270.06	0.61
10357	89.6	270	8783.18	1.91	-1737.32	1737.24	1737.32	270.06	0.48
10452	90.8	269.4	8782.84	1.41	-1832.32	1832.24	1832.32	270.04	1.41
10545	90.7	269.3	8781.63	0.35	-1925.3	1925.23	1925.3	270.01	0.15
10640	92.3	270.1	8779.14	-0.14	-2020.27	2020.19	2020.27	270	1.88

10735	92.7	270.1	8775	0.02	-2115.17	2115.09	2115.17	270	0.42
10829	92.8	270.2	8770.49	0.27	-2209.07	2208.98	2209.07	270.01	0.15
10924	91.4	270.3	8767	0.68	-2304	2303.91	2304	270.02	1.48
11018	91.2	269.8	8764.87	0.76	-2397.97	2397.88	2397.97	270.02	0.57
11113	91.1	269.7	8762.97	0.35	-2492.95	2492.86	2492.95	270.01	0.15
11205	90.4	269.1	8761.76	-0.61	-2584.94	2584.85	2584.94	269.99	1
11297	90	268.3	8761.44	-2.7	-2676.92	2676.84	2676.92	269.94	0.97
11391	89.8	268.3	8761.6	-5.49	-2770.87	2770.82	2770.88	269.89	0.21
11486	89.8	267.7	8761.94	-8.81	-2865.81	2865.78	2865.83	269.82	0.63
11581	89.9	267.7	8762.18	-12.62	-2960.74	2960.74	2960.77	269.76	0.11
11676	90.3	267.4	8762.02	-16.68	-3055.65	3055.68	3055.7	269.69	0.53
11770	89.8	267.2	8761.94	-21.11	-3149.55	3149.61	3149.62	269.62	0.57
11864	89.9	267.2	8762.18	-25.7	-3243.43	3243.53	3243.54	269.55	0.11
11958	89.9	267.2	8762.35	-30.29	-3337.32	3337.46	3337.46	269.48	0
12053	89.9	266.7	8762.51	-35.35	-3432.19	3432.36	3432.37	269.41	0.53
12148	89.2	267.8	8763.26	-39.9	-3527.07	3527.29	3527.3	269.35	1.37
12243	90.1	268	8763.84	-43.38	-3622.01	3622.25	3622.27	269.31	0.97
12338	91.9	267.8	8762.18	-46.86	-3716.92	3717.19	3717.22	269.28	1.91
12431	93	267.8	8758.21	-50.43	-3809.77	3810.06	3810.1	269.24	1.18
12525	93.1	268.5	8753.2	-53.46	-3903.59	3903.9	3903.95	269.22	0.75
12618	91.2	269.3	8749.72	-55.25	-3996.5	3996.83	3996.88	269.21	2.22
12713	91.4	269.1	8747.56	-56.57	-4091.46	4091.8	4091.86	269.21	0.3
12807	90.6	270.6	8745.92	-56.82	-4185.45	4185.78	4185.83	269.22	1.81
12902	89.6	271.2	8745.75	-55.32	-4280.43	4280.75	4280.79	269.26	1.23
12997	90.1	271.5	8746	-53.09	-4375.41	4375.7	4375.73	269.3	0.61
13090	91.2	271.8	8744.95	-50.41	-4468.36	4468.63	4468.64	269.35	1.23
13183	90	271.5	8743.97	-47.73	-4561.31	4561.56	4561.56	269.4	1.33
13277	90.4	271.6	8743.65	-45.19	-4655.28	4655.5	4655.5	269.44	0.44
13305	90.1	271.6	8743.52	-44.41	-4683.27	4683.48	4683.48	269.46	1.07
13360	90.1	271.6	8743.43	-42.87	-4738.25	4738.44	4738.44	269.48	0