

Results of Directional Survey

API number:	30-025-40594		
OGRID:		Operator:	COG OPERATING LLC
		Property:	BUFFLEHEAD 10 FEDERAL # 2H

surface	ULSTR:	A	10	T	26S	R	32E
				330	FNL	480	FEL

BH Loc	ULSTR:	P	10	T	26S	R	32E
13856	MD	9519.8	TVD	291	FSL	302	FEL
				4989	FNL		

Top Perf/OH	ULSTR:	A	10	T	26S	R	32E
9720	MD	9503.1	TVD	857	FNL	406	FEL

Bot Perf/OH	ULSTR:	P	10	T	26S	R	32E
13810	MD	9519.9	TVD	337	FSL	305	FEL
				4943	FNL		

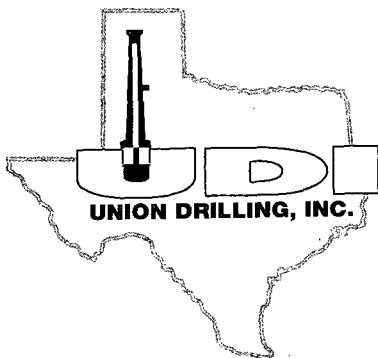
	MD	N/S	E/W	VD
	9689	-497.23	73.46	9494.92
TOP PERFS/OH	9720	-527.12	74.14	9503.13
	9720	-527.12	74.14	9503.13
	13666	-4469.17	167.20	9520.81
BOT PERFS/OH	13810	-4612.94	175.11	9519.93
	13812	-4614.94	175.22	9519.92

NEXT TO LAST	13812	-4614.94	175.22	9519.92
LAST READING	13860	-4662.84	178.32	9519.75
TD	13856	-4658.85	178.06	9519.76

Surface Location	330	FN	480	FE
Projected BHL	4989	FN	302	FE
Location of				
Top Perfs/OH	857	FN	406	FE
Bottom Perfs/OH	4943	FN	305	FE

SUMMARY of Subsurface Locations

Surface Location	A-10-26S-32E	330	FN	480	FE	Vert. Depth
Top Perfs/OH	A-10-26S-32E	857	FN	406	FE	9503.13
Bottom Perfs/OH	P-10-26S-32E	4943	FN	305	FE	9519.93
Projected TD	P-10-26S-32E	4989	FN	302	FE	9519.76



HOBBS OCD

DEC 06 2012

RECEIVED

Well Name & Number: Bufflehead 10 Federal #2H

API Number: 30-025-40594

Location: 330 FNL & 480 FEL, Lot A, Sec. 10, Township 26-S, Range 32-E, Lea County, New Mexico

Operator: COG Operating, LLC

Drilling Contractor: Union Drilling, Inc.

SUR: A-10-26s-32e, 330/N & 480/E
BHL: P-10-26s-32e, 4989/N & 302/E
API # 30-025-40594

The undersigned hereby certifies that he is an authorized representative of the drilling Contractor who drilled the above described well and that deviation survey tests were conducted and he obtained the following results:

RECORD OF INCLINATION

*11. Measured Depth (feet)	12. Course Length (Hundreds of feet)	*13. Angle of Inclination (Degrees)	14. Displacement per Hundred Feet (Sine of Angle X100)	15. Course Displacement (feet)	16. Accumulative Displacement (feet)
162	162	.1	0.17	0.28	0.28
925	763	2.2	3.84	29.30	29.58
1867	942	1.3	2.27	21.37	50.95
2749	882	1.7	2.97	26.17	77.12
3701	952	1.9	3.32	31.57	108.69
4534	833	15	26.11	217.46	326.14
5401	867	.6	1.05	9.08	335.22
6068	667	.5	0.87	5.82	341.04
7059	991	.5	0.87	8.65	349.69
8003	944	.8	1.40	13.18	362.87
8995	992	.7	1.22	12.12	374.99
DIRECTIONAL TOOK OVER					

Drilling Contractor: Union Drilling, Inc.

By: Jim Mayfield
Jim Mayfield

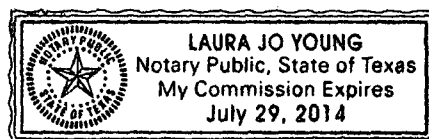
Title: Division Manager

Subscribed and sworn to before me this 28TH Day of August, 2012.

Laura Jo Young
Notary Public

My Commission Expires: July 29, 2014

COUNTY OF TAYLOR)
)
STATE OF TEXAS)





A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

August 21, 2012

HOBBS OCD

DEC 27 2012

RECEIVED

COG Operating LLC (Concho)
550 West Texas Avenue Ste. 100
Midland, Texas 79701

Attn: Kanicia Castillo

SUR: A-10-26s-32e, 330/N & 480/E
BHL: P-10-26s-32e, 4989/N & 302/E
API # 30-025-40594

Re: **Bufflehead 10 Federal 2H**

Please find enclosed a copy of the survey from 0' to 8,911' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations



Company: COG Operating, LLC (Concho)
Lease/Well: Bufflehead 10 Federal/2H
Location: SEC10 T26S R32E
Rig Name: UDI 216
State/County: New Mexico/Lea
Latitude: 32.06
GRID North is 0.36 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=21 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 8/21/2012 / 08:57

Vaughn Energy Services
Gardendale, TX
(432) 563-5444
Surveyor: Colby Ware
Bufflehead 10 Federal 2H / API 30-025-40594

HOBBS OCD

DEC 27 2012

RECEIVED

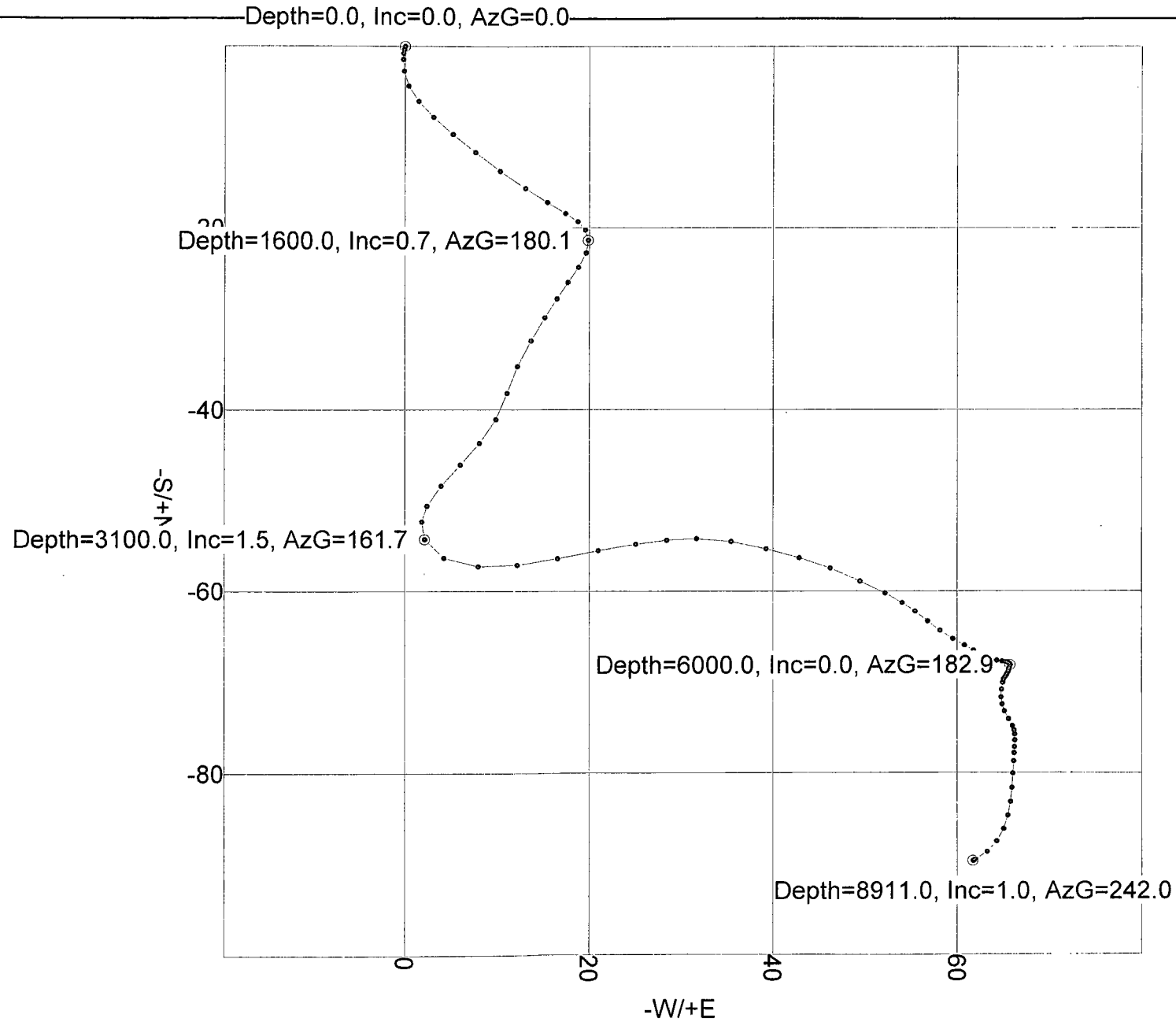
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.37	196.05	100.00	-0.31	-0.09	0.32	196.05	0.37
200.00	0.19	187.50	200.00	-0.79	-0.20	0.82	194.28	0.18
300.00	0.56	179.92	300.00	-1.45	-0.22	1.47	188.72	0.37
400.00	0.94	172.34	399.99	-2.75	-0.11	2.76	182.35	0.38
500.00	1.09	155.94	499.97	-4.43	0.38	4.45	175.06	0.32
600.00	1.24	139.54	599.95	-6.12	1.47	6.29	166.48	0.36
700.00	1.49	134.70	699.92	-7.85	3.09	8.44	158.50	0.27
800.00	1.73	129.85	799.88	-9.73	5.18	11.02	152.00	0.28
900.00	1.88	128.62	899.83	-11.72	7.62	13.98	146.99	0.15
1000.00	2.02	126.39	999.78	-13.79	10.32	17.23	143.20	0.16
1100.00	1.76	122.26	1099.72	-15.66	13.04	20.38	140.22	0.29
1200.00	1.51	122.14	1199.68	-17.18	15.46	23.11	138.03	0.26
1300.00	1.12	121.58	1299.65	-18.40	17.40	25.32	136.59	0.38
1400.00	0.74	128.02	1399.64	-19.31	18.75	26.92	135.84	0.39
1500.00	0.71	149.07	1499.63	-20.24	19.58	28.16	135.95	0.27
1600.00	0.69	180.11	1599.63	-21.38	19.90	29.21	137.05	0.38
1700.00	0.91	198.04	1699.62	-22.73	19.65	30.05	139.16	0.33
1800.00	1.13	215.96	1799.60	-24.29	18.83	30.73	142.22	0.39

measured Depth FT	measured Angle Deg	Strike Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.20	213.66	1899.58	-25.96	17.66	31.40	145.77	0.08
2000.00	1.27	212.36	1999.56	-27.77	16.49	32.30	149.30	0.07
2100.00	1.56	212.47	2099.53	-29.85	15.17	33.48	153.06	0.29
2200.00	1.84	209.58	2199.48	-32.39	13.65	35.15	157.15	0.30
2300.00	1.83	205.02	2299.43	-35.24	12.18	37.28	160.93	0.15
2400.00	1.81	196.46	2399.38	-38.20	11.06	39.77	163.86	0.27
2500.00	1.80	208.56	2499.33	-41.09	9.86	42.26	166.51	0.38
2600.00	1.84	220.66	2599.28	-43.69	8.06	44.43	169.55	0.39
2700.00	1.79	221.49	2699.23	-46.08	5.98	46.47	172.61	0.06
2800.00	1.77	222.31	2799.18	-48.39	3.91	48.55	175.39	0.03
2900.00	1.30	204.43	2899.15	-50.57	2.40	50.62	177.29	0.66
3000.00	0.83	186.55	2999.13	-52.33	1.84	52.36	177.98	0.57
3100.00	1.49	161.71	3099.11	-54.28	2.17	54.32	177.71	0.81
3200.00	2.14	116.87	3199.06	-56.35	4.24	56.51	175.70	1.51
3300.00	2.34	92.03	3298.99	-57.27	7.94	57.81	172.11	0.98
3400.00	2.54	84.19	3398.90	-57.12	12.18	58.40	167.96	0.39
3500.00	2.57	77.78	3498.80	-56.42	16.57	58.80	163.63	0.29
3600.00	2.61	79.38	3598.70	-55.52	21.00	59.36	159.28	0.08
3700.00	2.17	81.01	3698.61	-54.81	25.10	60.28	155.39	0.45
3800.00	1.73	84.63	3798.55	-54.37	28.47	61.37	152.36	0.46
3900.00	2.01	89.57	3898.50	-54.22	31.72	62.82	149.67	0.33
4000.00	2.30	99.51	3998.43	-54.54	35.45	65.05	146.97	0.47
4100.00	2.17	104.97	4098.35	-55.36	39.26	67.87	144.65	0.25
4200.00	2.05	105.44	4198.29	-56.32	42.81	70.75	142.76	0.13
4300.00	2.03	112.52	4298.22	-57.48	46.17	73.72	141.23	0.25
4400.00	2.02	114.60	4398.16	-58.89	49.40	76.87	140.00	0.07
4500.00	1.48	118.22	4498.11	-60.23	52.14	79.66	139.12	0.54
4600.00	0.97	121.84	4598.09	-61.29	54.00	81.68	138.62	0.52
4700.00	0.98	126.51	4698.08	-62.24	55.41	83.33	138.33	0.08
4800.00	1.01	131.17	4798.06	-63.33	56.76	85.04	138.13	0.09
4900.00	0.97	124.62	4898.05	-64.39	58.12	86.74	137.93	0.12
5000.00	0.94	120.07	4998.03	-65.28	59.53	88.35	137.64	0.08
5100.00	0.74	119.68	5098.02	-66.01	60.79	89.74	137.36	0.20
5200.00	0.54	118.29	5198.01	-66.56	61.77	90.80	137.14	0.20
5300.00	0.55	116.76	5298.01	-67.00	62.61	91.70	136.94	0.02
5400.00	0.56	112.23	5398.01	-67.40	63.49	92.60	136.71	0.04
5500.00	0.42	104.02	5498.00	-67.67	64.30	93.35	136.46	0.16
5600.00	0.28	95.82	5598.00	-67.78	64.90	93.84	136.25	0.15
5700.00	0.20	101.12	5698.00	-67.84	65.31	94.17	136.09	0.08

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.13	126.42	5798.00	-67.95	65.58	94.43	136.01	0.10
5900.00	0.09	134.67	5898.00	-68.07	65.73	94.62	136.00	0.04
6000.00	0.05	182.91	5998.00	-68.16	65.78	94.73	136.02	0.07
6100.00	0.09	209.59	6098.00	-68.28	65.74	94.78	136.08	0.05
6200.00	0.15	196.26	6198.00	-68.47	65.66	94.87	136.20	0.07
6300.00	0.11	194.44	6298.00	-68.70	65.60	94.99	136.32	0.04
6400.00	0.10	199.63	6398.00	-68.87	65.55	95.08	136.42	0.02
6500.00	0.15	207.84	6498.00	-69.07	65.46	95.16	136.54	0.06
6600.00	0.11	211.04	6598.00	-69.27	65.34	95.23	136.67	0.04
6700.00	0.18	213.56	6698.00	-69.49	65.21	95.29	136.82	0.07
6800.00	0.14	204.08	6798.00	-69.73	65.07	95.37	136.98	0.05
6900.00	0.33	195.11	6898.00	-70.12	64.95	95.58	137.19	0.20
7000.00	0.53	186.13	6997.99	-70.86	64.82	96.04	137.55	0.21
7100.00	0.47	177.19	7097.99	-71.74	64.79	96.66	137.91	0.10
7200.00	0.41	168.24	7197.99	-72.50	64.88	97.29	138.17	0.09
7300.00	0.51	157.63	7297.98	-73.26	65.13	98.02	138.36	0.13
7400.00	0.61	147.01	7397.98	-74.12	65.58	98.97	138.50	0.14
7500.00	0.40	157.53	7497.97	-74.89	66.01	99.83	138.61	0.23
7600.00	0.19	168.05	7597.97	-75.38	66.18	100.31	138.72	0.21
7700.00	0.32	174.66	7697.97	-75.82	66.24	100.68	138.86	0.13
7800.00	0.42	181.28	7797.97	-76.46	66.26	101.18	139.09	0.11
7900.00	0.41	182.80	7897.97	-77.19	66.23	101.71	139.37	0.02
8000.00	0.38	183.33	7997.96	-77.87	66.19	102.20	139.64	0.03
8100.00	0.63	183.19	8097.96	-78.75	66.14	102.85	139.97	0.26
8200.00	0.91	184.06	8197.95	-80.10	66.06	103.82	140.49	0.28
8300.00	0.90	184.13	8297.94	-81.68	65.94	104.97	141.08	0.01
8400.00	0.89	187.20	8397.93	-83.24	65.79	106.10	141.68	0.05
8500.00	0.88	192.74	8497.91	-84.76	65.52	107.13	142.30	0.09
8600.00	0.91	201.29	8597.90	-86.25	65.06	108.04	142.97	0.14
8700.00	0.93	215.57	8697.89	-87.64	64.31	108.70	143.73	0.23
8800.00	0.90	229.85	8797.88	-88.81	63.24	109.02	144.55	0.23
8900.00	0.95	242.01	8897.86	-89.70	61.90	108.99	145.39	0.20
8911.00	1.00	242.04	8908.86	-89.79	61.74	108.97	145.49	0.45



Vaughn Energy Services
Gardendale, TX
(432) 563-5444
Surveyor: Colby Ware
Bufflehead 10 Federal 2H / API 30-025-40594



VES Survey Date: 08/15/2012

CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

Client: CONCHO OIL AND GAS
Well: BUFFLEHEAD 10 FED 2H
County: LEA
Rig: UNION 216

M.W.D. OPERATORS: D. SCULLY, E. JOHNSON
DIRECTIONAL DRILLERS:
Tool Azimuth to Grid North: 7.11
Job #: PB-12512

Vertical Section Angle: 177.46

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	DLS
40	10920.00	89.10	177.50	9534.05	1727.59	-1725.01	96.25	1.61
41	11013.00	91.40	179.60	9533.65	1820.56	-1817.97	98.61	3.35
42	11108.00	92.20	180.00	9530.66	1915.43	-1912.92	98.94	0.94
43	11203.00	92.90	180.30	9526.44	2010.23	-2007.83	98.69	0.80
44	11297.00	91.00	180.20	9523.24	2104.06	-2101.77	98.28	2.02
45	11392.00	89.30	179.40	9522.99	2198.98	-2196.76	98.61	1.98
46	11487.00	88.90	178.80	9524.48	2293.93	-2291.74	100.10	0.76
47	11582.00	88.40	178.30	9526.72	2388.88	-2386.68	102.51	0.74
48	11676.00	89.10	179.40	9528.77	2482.83	-2480.64	104.39	1.39
49	11771.00	89.50	179.30	9529.93	2577.77	-2575.63	105.47	0.43
50	11866.00	89.30	179.80	9530.93	2672.70	-2670.62	106.22	0.57
51	11961.00	89.30	179.50	9532.09	2767.62	-2765.61	106.80	0.32
52	12055.00	89.70	180.00	9532.91	2861.55	-2859.60	107.21	0.68
53	12150.00	90.40	179.70	9532.82	2956.46	-2954.60	107.46	0.80
54	12245.00	90.30	178.80	9532.24	3051.41	-3049.59	108.70	0.95
55	12339.00	90.00	178.20	9532.00	3145.40	-3143.56	111.16	0.71
56	12434.00	90.90	177.40	9531.25	3240.39	-3238.48	114.81	1.27
57	12529.00	91.30	177.00	9529.43	3335.37	-3333.35	119.45	0.60
58	12624.00	90.10	177.20	9528.27	3430.36	-3428.22	124.25	1.28
59	12718.00	89.70	177.30	9528.43	3524.36	-3522.11	128.76	0.44
60	12813.00	89.40	177.00	9529.18	3619.36	-3616.99	133.49	0.45
61	12908.00	89.30	176.50	9530.26	3714.34	-3711.83	138.87	0.54
62	13002.00	89.80	178.50	9530.99	3808.33	-3805.74	142.97	2.19
63	13097.00	91.50	178.70	9529.92	3903.30	-3900.70	145.29	1.80
64	13192.00	91.10	178.00	9527.76	3998.27	-3995.63	148.03	0.85
65	13287.00	90.80	177.10	9526.19	4093.25	-4090.53	152.09	1.00
66	13381.00	90.90	176.80	9524.79	4187.24	-4184.39	157.09	0.34
67	13476.00	90.40	178.30	9523.71	4282.23	-4279.29	161.15	1.66
68	13571.00	91.30	178.50	9522.30	4377.21	-4374.24	163.80	0.97
69	13666.00	90.50	177.40	9520.81	4472.19	-4469.17	167.20	1.43
70	13812.00	90.20	176.30	9519.92	4618.18	-4614.94	175.22	0.78
PTB	13860.00	90.20	176.30	9519.75	4666.17	-4662.84	178.32	0.00

13856

9529

CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

Client: CONCHO OIL AND GAS
Well: BUFFLEHEAD 10 FED 2H
County: LEA
Rig: UNION 216

M.W.D. OPERATORS: D. SCULLY, E. JOHNSON
DIRECTIONAL DRILLERS:
Tool Azimuth to Grid North: 7.11
Job #: PB-12512

Vertical Section Angle: 177.46

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N/-S	+E/-W	DLS
Tie In	8911.00	1.00	242.04	8908.86	92.37	-89.74	61.78	
1	8995.00	0.70	231.80	8992.85	93.00	-90.40	60.73	0.40
2	9027.00	3.60	171.10	9024.83	94.12	-91.51	60.73	10.36
3	9058.00	7.80	171.20	9055.67	97.18	-94.56	61.20	13.55
4	9090.00	11.40	171.70	9087.21	102.48	-99.83	61.99	11.25
5	9122.00	15.20	174.00	9118.35	109.82	-107.14	62.89	11.99
6	9152.00	17.90	173.70	9147.10	118.35	-115.63	63.81	9.00
7	9183.00	22.70	175.90	9176.17	129.09	-126.34	64.76	15.68
8	9215.00	26.10	176.90	9205.31	142.30	-139.53	65.58	10.70
9	9246.00	29.20	179.30	9232.77	156.68	-153.91	66.04	10.62
10	9278.00	32.80	179.40	9260.19	173.15	-170.38	66.23	11.25
11	9310.00	36.30	179.60	9286.54	191.29	-188.53	66.38	10.94
12	9341.00	40.00	179.20	9310.92	210.42	-207.67	66.59	11.96
13	9373.00	43.80	177.90	9334.73	231.78	-229.03	67.14	12.18
14	9404.00	47.20	177.10	9356.46	253.89	-251.12	68.10	11.12
15	9436.00	51.20	176.60	9377.36	278.11	-275.30	69.44	12.56
16	9467.00	53.90	176.20	9396.21	302.71	-299.86	70.99	8.77
17	9499.00	55.80	176.30	9414.63	328.87	-325.97	72.70	5.94
18	9531.00	57.80	177.80	9432.15	355.64	-352.71	74.07	7.38
19	9562.00	62.10	180.00	9447.67	382.46	-379.53	74.57	15.17
20	9594.00	66.60	181.00	9461.52	411.26	-408.36	74.32	14.34
21	9625.00	68.00	181.00	9473.49	439.80	-436.96	73.82	4.52
22	9657.00	70.30	180.60	9484.88	469.65	-466.86	73.40	7.28
23	9689.00	73.10	179.20	9494.92	500.00	-497.23	73.46	9.69
24	9720.00	76.20	178.20	9503.13	529.88	-527.12	74.14	10.47
25	9752.00	78.70	177.50	9510.08	561.12	-558.33	75.31	8.10
26	9783.00	80.90	177.90	9515.57	591.62	-588.81	76.53	7.21
27	9815.00	83.70	178.70	9519.86	623.33	-620.50	77.47	9.09
28	9846.00	86.00	179.00	9522.64	654.19	-651.37	78.09	7.48
29	9878.00	88.70	179.60	9524.12	686.14	-683.33	78.48	8.64
30	9973.00	88.60	179.90	9526.36	781.04	-778.30	78.90	0.33
31	10068.00	90.90	180.20	9526.77	875.93	-873.30	78.82	2.44
32	10162.00	90.00	179.40	9526.03	969.85	-967.29	79.14	1.28
33	10257.00	89.40	179.00	9526.53	1064.80	-1062.28	80.47	0.76
34	10352.00	88.20	177.90	9528.52	1159.76	-1157.22	83.04	1.71
35	10446.00	89.50	179.40	9530.41	1253.72	-1251.17	85.25	2.11
36	10541.00	89.50	178.80	9531.24	1348.68	-1346.16	86.74	0.63
37	10636.00	89.10	178.80	9532.40	1443.64	-1441.13	88.73	0.42
38	10731.00	90.00	178.50	9533.14	1538.62	-1536.10	90.97	1.00
39	10825.00	89.90	178.80	9533.22	1632.60	-1630.07	93.19	0.34