



30-015-41538

July 15, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 27 2014

RECEIVED

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: Running Buffalo 1 Federal Com No. 001H

Please find enclosed a copy of the survey from 0.00' to 7985.00' ran on the above referenced well.

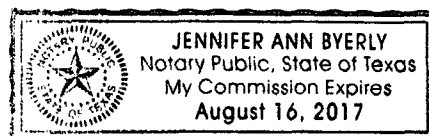
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 15 day of July, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)
Lease/Well: Running Buffalo 1 Federal Com /No. 001H
Location: Sec 1 T 21S R28E
Rig Name: Patriot 6
State/County: New Mexico/Eddy
Latitude: 32.51, Longitude: -104.03
GRID North is 0.16 Degrees East of True North
VS-Azi: 0.00 Degrees



NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 27 2014
RECEIVED

Depth Reference : RKB=17 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...o 1 fed com #1h gyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/15/2014 / 16:32

VES Survey International

West Texas

432-563-5444

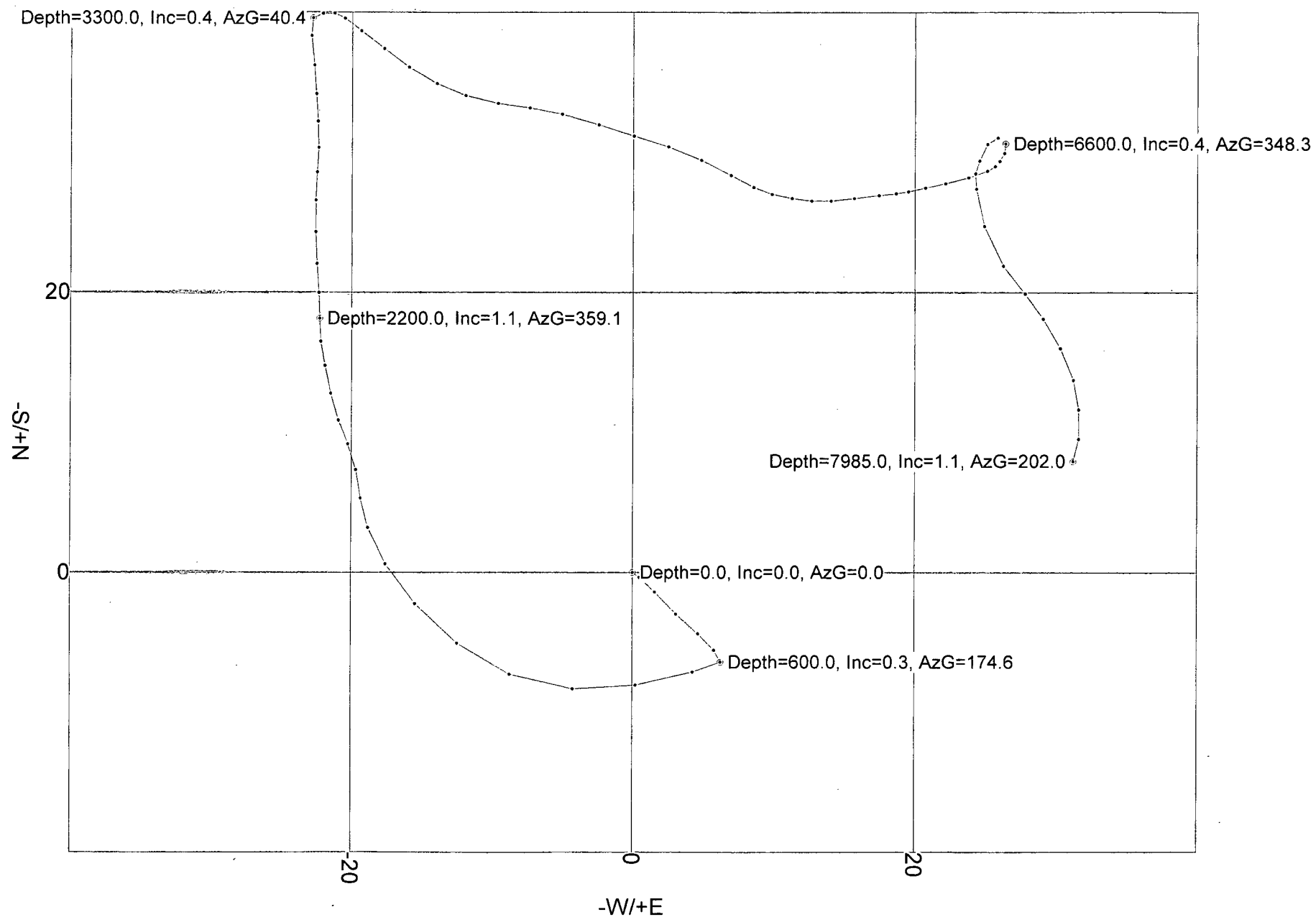
Surveyor: Chris Bankson

Running Buffalo 1 Federal Com No. 001H / API 30-015-41538

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section 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	0.00	****
100.00	0.69	125.32	100.00	-0.35	0.49	-0.35	0.60	125.32	0.69
200.00	1.08	138.51	199.99	-1.40	1.60	-1.40	2.13	131.10	0.44
300.00	1.41	134.82	299.96	-2.97	3.10	-2.97	4.30	133.79	0.35
400.00	1.01	127.54	399.94	-4.38	4.68	-4.38	6.41	133.13	0.43
500.00	0.88	144.93	499.93	-5.54	5.81	-5.54	8.03	133.63	0.31
600.00	0.26	174.59	599.92	-6.40	6.27	-6.40	8.96	135.56	0.66
700.00	2.35	256.59	699.89	-7.10	4.30	-7.10	8.30	148.78	2.32
800.00	2.44	257.44	799.80	-8.04	0.23	-8.04	8.04	178.33	0.10
900.00	2.74	274.57	899.70	-8.31	-4.22	-8.31	9.32	206.94	0.83
1000.00	2.57	292.05	999.60	-7.28	-8.69	-7.28	11.33	230.05	0.82
1100.00	2.47	309.98	1099.50	-5.05	-12.42	-5.05	13.41	247.85	0.79
1200.00	2.25	317.19	1199.42	-2.23	-15.40	-2.23	15.56	261.74	0.37
1300.00	1.85	330.48	1299.36	0.61	-17.52	0.61	17.53	271.99	0.61
1400.00	1.45	340.05	1399.31	3.20	-18.75	3.20	19.02	279.69	0.49
1500.00	1.07	350.29	1499.29	5.31	-19.34	5.31	20.05	285.35	0.44
1600.00	1.28	349.59	1599.27	7.32	-19.70	7.32	21.01	290.39	0.21
1700.00	0.95	335.12	1699.25	9.17	-20.25	9.17	22.22	294.36	0.43
1800.00	1.15	340.09	1799.23	10.86	-20.94	10.86	23.59	297.42	0.22

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.14	347.87	1899.21	12.78	-21.49	12.78	25.00	300.74	0.16
2000.00	1.19	347.19	1999.19	14.76	-21.93	14.76	26.43	303.95	0.06
2100.00	0.82	354.37	2099.18	16.49	-22.23	16.49	27.68	306.57	0.40
2200.00	1.07	359.11	2199.16	18.13	-22.31	18.13	28.75	309.09	0.26
2300.00	1.03	357.69	2299.15	19.96	-22.36	19.96	29.98	311.75	0.04
2400.00	1.35	355.25	2399.12	22.04	-22.50	22.04	31.49	314.41	0.32
2500.00	1.23	359.68	2499.10	24.29	-22.60	24.29	33.17	317.06	0.15
2600.00	1.35	0.73	2599.07	26.54	-22.59	26.54	34.85	319.60	0.12
2700.00	0.96	4.82	2699.05	28.55	-22.51	28.55	36.36	321.75	0.40
2800.00	1.04	2.08	2799.04	30.29	-22.40	30.29	37.68	323.51	0.10
2900.00	1.12	355.26	2899.02	32.18	-22.45	32.18	39.24	325.10	0.15
3000.00	1.11	358.14	2999.00	34.13	-22.56	34.13	40.91	326.53	0.06
3100.00	1.26	353.75	3098.98	36.19	-22.71	36.19	42.73	327.89	0.17
3200.00	1.18	354.91	3198.96	38.30	-22.93	38.30	44.64	329.10	0.08
3300.00	0.35	40.41	3298.95	39.56	-22.82	39.56	45.67	330.02	0.96
3400.00	0.59	80.39	3398.95	39.88	-22.12	39.88	45.60	330.99	0.39
3500.00	0.40	100.11	3498.94	39.90	-21.27	39.90	45.22	331.94	0.25
3600.00	0.58	124.33	3598.94	39.55	-20.51	39.55	44.56	332.59	0.27
3700.00	1.17	126.88	3698.93	38.66	-19.28	38.66	43.20	333.49	0.59
3800.00	1.20	129.85	3798.90	37.38	-17.66	37.38	41.34	334.71	0.07
3900.00	1.35	124.49	3898.88	36.04	-15.89	36.04	39.39	336.21	0.20
4000.00	1.27	116.53	3998.85	34.87	-13.92	34.87	37.55	338.24	0.20
4100.00	1.27	108.70	4098.83	34.02	-11.87	34.02	36.03	340.76	0.17
4200.00	1.44	99.51	4198.80	33.46	-9.58	33.46	34.80	344.02	0.28
4300.00	1.15	96.72	4298.78	33.13	-7.34	33.13	33.93	347.51	0.30
4400.00	1.52	104.00	4398.75	32.69	-5.05	32.69	33.08	351.21	0.41
4500.00	1.59	108.46	4498.71	31.93	-2.45	31.93	32.03	355.61	0.14
4600.00	1.42	106.79	4598.68	31.14	0.05	31.14	31.14	0.09	0.18
4700.00	1.53	108.17	4698.64	30.36	2.50	30.36	30.47	4.71	0.12
4800.00	1.38	116.35	4798.61	29.41	4.85	29.41	29.81	9.36	0.25
4900.00	1.33	118.35	4898.58	28.33	6.95	28.33	29.17	13.78	0.07
5000.00	0.76	117.28	4998.57	27.47	8.56	27.47	28.77	17.30	0.57
5100.00	0.81	104.13	5098.56	27.00	9.83	27.00	28.73	20.02	0.19
5200.00	0.85	100.00	5198.55	26.69	11.25	26.69	28.97	22.86	0.07
5300.00	0.78	95.14	5298.54	26.50	12.66	26.50	29.37	25.54	0.09
5400.00	0.79	84.37	5398.53	26.51	14.03	26.51	29.99	27.88	0.15
5500.00	1.11	83.23	5498.51	26.69	15.67	26.69	30.95	30.42	0.33
5600.00	0.93	83.04	5598.50	26.90	17.44	26.90	32.06	32.95	0.18
5700.00	0.45	85.14	5698.49	27.04	18.64	27.04	32.84	34.59	0.48

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.57	77.78	5798.49	27.17	19.52	27.17	33.46	35.69	0.14
5900.00	0.83	77.59	5898.48	27.44	20.72	27.44	34.38	37.06	0.26
6000.00	0.85	78.08	5998.47	27.75	22.16	27.75	35.51	38.61	0.02
6100.00	1.10	73.22	6098.45	28.18	23.80	28.18	36.89	40.19	0.26
6200.00	0.50	64.72	6198.44	28.64	25.12	28.64	38.10	41.25	0.61
6300.00	0.25	47.00	6298.44	28.98	25.68	28.98	38.72	41.54	0.28
6400.00	0.32	36.92	6398.44	29.35	26.00	29.35	39.21	41.54	0.09
6500.00	0.43	23.56	6498.44	29.92	26.32	29.92	39.85	41.34	0.14
6600.00	0.40	348.35	6598.43	30.61	26.40	30.61	40.42	40.78	0.25
6700.00	0.55	278.02	6698.43	31.01	25.86	31.01	40.38	39.82	0.56
6800.00	0.66	205.16	6798.43	30.56	25.14	30.56	39.57	39.43	0.72
6900.00	0.83	204.95	6898.42	29.38	24.59	29.38	38.31	39.92	0.18
7000.00	0.28	180.28	6998.41	28.48	24.28	28.48	37.42	40.45	0.59
7100.00	0.99	174.73	7098.41	27.37	24.36	27.37	36.64	41.66	0.71
7200.00	2.13	164.52	7198.37	24.72	24.93	24.72	35.11	45.24	1.17
7300.00	1.53	141.08	7298.32	21.89	26.27	21.89	34.19	50.19	0.94
7400.00	1.35	144.17	7398.29	19.90	27.80	19.90	34.18	54.40	0.20
7500.00	1.17	145.06	7498.26	18.11	29.07	18.11	34.25	58.08	0.18
7600.00	1.62	153.13	7598.23	16.01	30.30	16.01	34.26	62.15	0.49
7700.00	1.18	164.52	7698.20	13.76	31.21	13.76	34.11	66.21	0.52
7800.00	1.30	174.44	7798.18	11.64	31.59	11.64	33.67	69.77	0.24
7900.00	1.13	186.42	7898.16	9.53	31.59	9.53	33.00	73.21	0.30
7985.00	1.09	202.05	7983.14	7.94	31.19	7.94	32.19	75.71	0.36



VES Survey Date: 07/05/2014



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Running Buffalo 1 Federal Com Well 1H
Project:	Eddy County, New Mexico NAD83	TVD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Site:	Running Buffalo 1 Federal Com	MD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Well:	Running Buffalo 1 Federal Com Well 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Project	Eddy County, New Mexico NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Running Buffalo 1 Federal Com		
Site Position:		Northing:	548,472.44 usft
From:	Map	Easting:	633,313.89 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 30' 26.84661801 N
		Longitude:	104° 2' 5.89011194 W
		Grid Convergence:	0.16 °

Well	Running Buffalo 1 Federal Com Well 1H, Surf Loc 1980 FSL 1090 FEL Sect 1		
Well Position	+N/-S	0.00 usft	Northing: 548,472.44 usft
	+E/-W	0.00 usft	Easting: 633,313.89 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 30' 26.84661801 N
		Longitude:	104° 2' 5.89011194 W
		Ground Level:	3,448.90 usft

Wellbore	Original hole		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF200510	6/6/2014	7.45
			Dip Angle (°)
			60.33
			Field Strength (nT)
			48,487

Design	Surveys Original hole		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			7.69

Survey Program	Date 7/16/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	7,985.00	Gyro (Original hole)	NS-GYRO-MS
8,111.00	13,617.00	MWD (Original hole)	MWD
			Description
			North sensing gyrocompassing m/s
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.00	0.00	0.00	0.00	0.00	0.00	548,472.44	633,313.89	2° 30' 26.84661801 N	104° 2' 5.89011194 W
100.00	0.69	125.32	100.00	-0.35	0.49	548,472.09	633,314.39	2° 30' 26.84315961 N	104° 2' 5.88438592 W
Gyro									
200.00	1.08	138.51	199.99	-1.40	1.61	548,471.04	633,315.50	2° 30' 26.83269828 N	104° 2' 5.87139191 W
300.00	1.41	134.82	299.96	-2.98	3.10	548,469.47	633,317.00	2° 30' 26.81708939 N	104° 2' 5.85396077 W
400.00	1.01	127.54	399.94	-4.38	4.68	548,468.06	633,318.57	2° 30' 26.80315000 N	104° 2' 5.83565408 W
500.00	0.88	144.93	499.93	-5.55	5.82	548,466.90	633,319.71	2° 30' 26.79158504 N	104° 2' 5.82237844 W
600.00	0.26	174.59	599.92	-6.40	6.28	548,466.04	633,320.17	2° 30' 26.78311761 N	104° 2' 5.81700387 W
700.00	2.35	256.59	699.89	-7.10	4.31	548,465.34	633,318.20	2° 30' 26.77623104 N	104° 2' 5.84006940 W
800.00	2.44	257.44	799.80	-8.04	0.23	548,464.40	633,314.13	2° 30' 26.76705812 N	104° 2' 5.88765283 W
900.00	2.74	274.57	899.70	-8.31	-4.23	548,464.13	633,309.67	2° 30' 26.76448548 N	104° 2' 5.93974995 W



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Running Buffalo 1 Federal Com Well 1H
Project:	Eddy County, New Mexico NAD83	TVD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Site:	Running Buffalo 1 Federal Com	MD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Well:	Running Buffalo 1 Federal Com Well 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,000.00	2.57	292.05	999.60	-7.28	-8.69	548,465.16	633,305.21	2° 30' 26.77482254 N	104° 2' 5.99180785 W
1,100.00	2.47	309.98	1,099.50	-5.05	-12.42	548,467.39	633,301.48	2° 30' 26.79695540 N	104° 2' 6.03528498 W
1,200.00	2.25	317.19	1,199.42	-2.23	-15.40	548,470.21	633,298.49	2° 30' 26.82498877 N	104° 2' 6.07005334 W
1,300.00	1.85	330.48	1,299.35	0.62	-17.53	548,473.06	633,296.36	2° 30' 26.85319748 N	104° 2' 6.09482681 W
1,400.00	1.45	340.05	1,399.31	3.21	-18.76	548,475.65	633,295.14	2° 30' 26.87889960 N	104° 2' 6.10907137 W
1,500.00	1.07	350.29	1,499.29	5.32	-19.35	548,477.76	633,294.55	2° 30' 26.89979177 N	104° 2' 6.11588283 W
1,600.00	1.28	349.59	1,599.27	7.34	-19.71	548,479.78	633,294.19	2° 30' 26.91977928 N	104° 2' 6.12001271 W
1,700.00	0.95	335.12	1,699.25	9.19	-20.26	548,481.63	633,293.64	2° 30' 26.93810708 N	104° 2' 6.12638205 W
1,800.00	1.15	340.09	1,799.23	10.88	-20.95	548,483.33	633,292.95	2° 30' 26.95490473 N	104° 2' 6.13439039 W
1,900.00	1.14	347.87	1,899.21	12.80	-21.50	548,485.24	633,292.40	2° 30' 26.97388051 N	104° 2' 6.14075963 W
2,000.00	1.19	347.19	1,999.19	14.79	-21.94	548,487.23	633,291.96	2° 30' 26.99353634 N	104° 2' 6.14582448 W
2,100.00	0.82	354.37	2,099.18	16.51	-22.24	548,488.95	633,291.66	2° 30' 27.01061107 N	104° 2' 6.14927657 W
2,200.00	1.07	359.11	2,199.16	18.16	-22.32	548,490.60	633,291.57	2° 30' 27.02689837 N	104° 2' 6.15021195 W
2,300.00	1.03	357.69	2,299.15	19.99	-22.37	548,492.43	633,291.52	2° 30' 27.04502485 N	104° 2' 6.15074453 W
2,400.00	1.35	355.25	2,399.12	22.06	-22.51	548,494.50	633,291.39	2° 30' 27.06553213 N	104° 2' 6.15223904 W
2,500.00	1.23	359.68	2,499.10	24.31	-22.61	548,496.75	633,291.28	2° 30' 27.08777235 N	104° 2' 6.15337478 W
2,600.00	1.35	0.73	2,599.07	26.56	-22.60	548,499.00	633,291.29	2° 30' 27.11004854 N	104° 2' 6.15319596 W
2,700.00	0.96	4.82	2,699.05	28.57	-22.52	548,501.01	633,291.38	2° 30' 27.12996239 N	104° 2' 6.15213292 W
2,800.00	1.04	2.08	2,799.04	30.31	-22.41	548,502.75	633,291.48	2° 30' 27.14719430 N	104° 2' 6.15086934 W
2,900.00	1.12	355.26	2,899.02	32.19	-22.46	548,504.64	633,291.43	2° 30' 27.16580807 N	104° 2' 6.15136635 W
3,000.00	1.11	358.14	2,999.00	34.14	-22.57	548,506.58	633,291.32	2° 30' 27.18502887 N	104° 2' 6.15261315 W
3,100.00	1.26	353.75	3,098.98	36.20	-22.72	548,508.64	633,291.17	2° 30' 27.20542787 N	104° 2' 6.15431075 W
3,200.00	1.18	354.91	3,198.96	38.31	-22.94	548,510.76	633,290.96	2° 30' 27.22639775 N	104° 2' 6.15670615 W
3,300.00	0.35	40.41	3,298.95	39.57	-22.83	548,512.02	633,291.06	2° 30' 27.23884533 N	104° 2' 6.15541963 W
3,400.00	0.59	80.39	3,398.94	39.89	-22.12	548,512.33	633,291.77	2° 30' 27.24197766 N	104° 2' 6.14716881 W
3,500.00	0.40	100.11	3,498.94	39.92	-21.27	548,512.36	633,292.62	2° 30' 27.24219829 N	104° 2' 6.13722674 W
3,600.00	0.58	124.33	3,598.94	39.57	-20.51	548,512.01	633,293.38	2° 30' 27.23874629 N	104° 2' 6.12834396 W
3,700.00	1.17	126.88	3,698.93	38.67	-19.28	548,511.11	633,294.62	2° 30' 27.22982438 N	104° 2' 6.11395533 W
3,800.00	1.20	129.85	3,798.90	37.39	-17.66	548,509.83	633,296.24	2° 30' 27.21707681 N	104° 2' 6.09507252 W
3,900.00	1.35	124.49	3,898.88	36.05	-15.88	548,508.49	633,298.01	2° 30' 27.20378725 N	104° 2' 6.07438981 W
4,000.00	1.27	116.53	3,998.85	34.89	-13.92	548,507.33	633,299.98	2° 30' 27.19223392 N	104° 2' 6.05151055 W
4,100.00	1.27	108.70	4,098.83	34.04	-11.88	548,506.48	633,302.02	2° 30' 27.18376333 N	104° 2' 6.02770131 W
4,200.00	1.44	99.51	4,198.80	33.47	-9.59	548,505.92	633,304.31	2° 30' 27.17812976 N	104° 2' 6.00098959 W
4,300.00	1.15	96.72	4,298.77	33.15	-7.35	548,505.59	633,306.54	2° 30' 27.17485155 N	104° 2' 5.97489006 W
4,400.00	1.52	104.00	4,398.75	32.71	-5.07	548,505.15	633,308.83	2° 30' 27.17045125 N	104° 2' 5.94823760 W
4,500.00	1.59	108.46	4,498.71	31.95	-2.47	548,504.39	633,311.43	2° 30' 27.16285705 N	104° 2' 5.91786616 W
4,600.00	1.42	106.79	4,598.68	31.15	0.04	548,503.60	633,313.93	2° 30' 27.15489890 N	104° 2' 5.88867146 W
4,700.00	1.53	108.17	4,698.64	30.38	2.49	548,502.82	633,316.39	2° 30' 27.14716957 N	104° 2' 5.86003101 W
4,800.00	1.38	116.35	4,798.61	29.43	4.84	548,501.87	633,318.73	2° 30' 27.13769611 N	104° 2' 5.83264803 W
4,900.00	1.33	118.35	4,898.58	28.34	6.94	548,500.79	633,320.83	2° 30' 27.12689580 N	104° 2' 5.80815512 W
5,000.00	0.76	117.28	4,998.57	27.49	8.55	548,499.93	633,322.44	2° 30' 27.11838985 N	104° 2' 5.78937214 W
5,100.00	0.81	104.13	5,098.56	27.01	9.82	548,499.45	633,323.72	2° 30' 27.11363906 N	104° 2' 5.77449955 W
5,200.00	0.85	100.00	5,198.55	26.71	11.24	548,499.15	633,325.13	2° 30' 27.11061779 N	104° 2' 5.75797435 W
5,300.00	0.78	95.14	5,298.54	26.52	12.65	548,498.96	633,326.54	2° 30' 27.10870080 N	104° 2' 5.74153341 W
5,400.00	0.79	84.37	5,398.53	26.53	14.01	548,498.97	633,327.91	2° 30' 27.10872884 N	104° 2' 5.72560468 W
5,500.00	1.11	83.23	5,498.51	26.71	15.66	548,499.15	633,329.55	2° 30' 27.11048233 N	104° 2' 5.70635453 W
5,600.00	0.93	83.04	5,598.50	26.92	17.43	548,499.36	633,331.32	2° 30' 27.11253639 N	104° 2' 5.68570784 W
5,700.00	0.45	85.14	5,698.49	27.05	18.62	548,499.50	633,332.52	2° 30' 27.11380559 N	104° 2' 5.67172673 W
5,800.00	0.57	77.78	5,798.49	27.19	19.50	548,499.63	633,333.40	2° 30' 27.11515235 N	104° 2' 5.66147566 W
5,900.00	0.83	77.59	5,898.48	27.45	20.70	548,499.89	633,334.59	2° 30' 27.11770140 N	104° 2' 5.64752940 W
6,000.00	0.85	78.08	5,998.47	27.76	22.13	548,500.20	633,336.02	2° 30' 27.12071799 N	104° 2' 5.63078351 W
6,100.00	1.10	73.22	6,098.45	28.19	23.77	548,500.63	633,337.67	2° 30' 27.12493062 N	104° 2' 5.61156212 W
6,200.00	0.50	64.72	6,198.44	28.66	25.09	548,501.10	633,338.98	2° 30' 27.12948026 N	104° 2' 5.59620731 W
6,300.00	0.25	47.00	6,298.44	28.99	25.64	548,501.43	633,339.54	2° 30' 27.13278108 N	104° 2' 5.58972562 W
6,400.00	0.32	36.92	6,398.44	29.36	25.97	548,501.80	633,339.86	2° 30' 27.13645356 N	104° 2' 5.58589123 W



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Running Buffalo 1 Federal Com Well 1H
Project:	Eddy County, New Mexico NAD83	TVD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Site:	Running Buffalo 1 Federal Com	MD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Well:	Running Buffalo 1 Federal Com Well 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,500.00	0.43	23.56	6,498.44	29.93	26.29	548,502.37	633,340.18	2° 30' 27.14205765 N	104° 2' 5.58216220 W
6,600.00	0.40	348.35	6,598.43	30.62	26.37	548,503.06	633,340.26	2° 30' 27.14884213 N	104° 2' 5.58121137 W
6,700.00	0.55	278.02	6,698.43	31.02	25.82	548,503.47	633,339.71	2° 30' 27.15290289 N	104° 2' 5.58757132 W
6,800.00	0.66	205.16	6,798.43	30.57	25.10	548,503.01	633,338.99	2° 30' 27.14842688 N	104° 2' 5.59599590 W
6,900.00	0.83	204.95	6,898.42	29.39	24.55	548,501.83	633,338.44	2° 30' 27.13678528 N	104° 2' 5.60246181 W
7,000.00	0.28	180.28	6,998.41	28.49	24.24	548,500.93	633,338.14	2° 30' 27.12787752 N	104° 2' 5.60607314 W
7,100.00	0.99	174.73	7,098.41	27.39	24.32	548,499.83	633,338.22	2° 30' 27.11694480 N	104° 2' 5.60519656 W
7,200.00	2.13	164.52	7,198.37	24.73	24.90	548,497.18	633,338.79	2° 30' 27.09069328 N	104° 2' 5.59856413 W
7,300.00	1.53	141.08	7,298.32	21.91	26.23	548,494.35	633,340.13	2° 30' 27.06265530 N	104° 2' 5.58306967 W
7,400.00	1.35	144.17	7,398.29	19.91	27.76	548,492.35	633,341.65	2° 30' 27.04288394 N	104° 2' 5.56528763 W
7,500.00	1.17	145.06	7,498.26	18.12	29.03	548,490.56	633,342.93	2° 30' 27.02511605 N	104° 2' 5.55046510 W
7,600.00	1.62	153.13	7,598.23	16.02	30.26	548,488.46	633,344.15	2° 30' 27.00432290 N	104° 2' 5.53624461 W
7,700.00	1.18	164.52	7,698.20	13.77	31.17	548,486.21	633,345.07	2° 30' 26.98200058 N	104° 2' 5.52564815 W
7,800.00	1.30	174.44	7,798.18	11.65	31.56	548,484.09	633,345.45	2° 30' 26.96099812 N	104° 2' 5.52122465 W
7,900.00	1.13	186.42	7,898.16	9.54	31.56	548,481.98	633,345.45	2° 30' 26.94012956 N	104° 2' 5.52129768 W
7,985.00	1.09	202.05	7,983.14	7.96	31.16	548,480.40	633,345.05	2° 30' 26.92448365 N	104° 2' 5.52598827 W
8,111.00	1.10	250.40	8,109.12	6.44	29.57	548,478.88	633,343.46	2° 30' 26.90952091 N	104° 2' 5.54459774 W
MWD surveys									
8,147.00	1.60	0.10	8,145.12	6.83	29.24	548,479.27	633,343.14	2° 30' 26.91335670 N	104° 2' 5.54837689 W
8,179.00	6.30	16.60	8,177.03	8.96	29.75	548,481.40	633,343.64	2° 30' 26.93442569 N	104° 2' 5.54243708 W
8,211.00	11.10	18.30	8,208.65	13.57	31.22	548,486.01	633,345.11	2° 30' 26.98000160 N	104° 2' 5.52512365 W
8,242.00	15.50	18.70	8,238.81	20.33	33.48	548,492.77	633,347.38	2° 30' 27.04683254 N	104° 2' 5.49843875 W
8,274.00	18.70	19.80	8,269.40	29.21	36.59	548,501.65	633,350.49	2° 30' 27.13460806 N	104° 2' 5.46183744 W
8,306.00	20.80	19.10	8,299.51	39.40	40.19	548,511.84	633,354.08	2° 30' 27.23540889 N	104° 2' 5.41949573 W
8,337.00	23.60	19.80	8,328.21	50.44	44.09	548,522.89	633,357.99	2° 30' 27.34456585 N	104° 2' 5.37354560 W
8,369.00	26.90	19.40	8,357.15	63.30	48.67	548,535.74	633,362.56	2° 30' 27.47167919 N	104° 2' 5.31969155 W
8,401.00	29.40	19.10	8,385.36	77.55	53.64	548,550.00	633,367.54	2° 30' 27.61257454 N	104° 2' 5.26112269 W
8,432.00	31.80	17.60	8,412.04	92.53	58.60	548,564.98	633,372.50	2° 30' 27.76065186 N	104° 2' 5.20270647 W
8,464.00	34.80	16.20	8,438.79	109.34	63.70	548,581.78	633,377.60	2° 30' 27.92684936 N	104° 2' 5.14262000 W
8,495.00	38.20	16.60	8,463.70	127.03	68.91	548,599.47	633,382.80	2° 30' 28.10171528 N	104° 2' 5.08122338 W
8,527.00	42.10	17.60	8,488.16	146.74	74.98	548,619.19	633,388.88	2° 30' 28.29663334 N	104° 2' 5.00966227 W
8,559.00	46.30	17.30	8,511.09	168.02	81.67	548,640.46	633,395.56	2° 30' 28.50700842 N	104° 2' 4.93088293 W
8,591.00	49.40	17.30	8,532.57	190.67	88.72	548,663.11	633,402.62	2° 30' 28.73093032 N	104° 2' 4.84776278 W
8,622.00	51.20	17.60	8,552.37	213.42	95.88	548,685.86	633,409.77	2° 30' 28.95587897 N	104° 2' 4.76348700 W
8,630.00	52.03	17.60	8,557.33	219.40	97.77	548,691.84	633,411.67	2° 30' 29.01497227 N	104° 2' 4.74114948 W
330 Hard line intercept @ 8630 MD									
8,654.00	54.50	17.60	8,571.69	237.73	103.59	548,710.17	633,417.48	2° 30' 29.19621016 N	104° 2' 4.67264073 W
8,686.00	59.50	16.60	8,589.11	263.38	111.47	548,735.82	633,425.36	2° 30' 29.44975486 N	104° 2' 4.57975184 W
8,717.00	64.60	15.20	8,603.64	289.70	118.96	548,762.15	633,432.86	2° 30' 29.71008447 N	104° 2' 4.49140087 W
8,749.00	67.70	14.50	8,616.58	317.99	126.46	548,790.43	633,440.35	2° 30' 29.98978776 N	104° 2' 4.40291426 W
8,781.00	70.90	14.50	8,627.89	346.97	133.95	548,819.41	633,447.85	2° 30' 30.27632102 N	104° 2' 4.31445084 W
8,813.00	75.80	14.10	8,637.05	376.67	141.52	548,849.11	633,455.42	2° 30' 30.57000319 N	104° 2' 4.22508807 W
8,844.00	79.50	13.80	8,643.68	406.05	148.82	548,878.49	633,462.72	2° 30' 30.86057446 N	104° 2' 4.13889273 W
8,876.00	79.90	14.50	8,649.40	436.58	156.52	548,909.02	633,470.41	2° 30' 31.16245780 N	104° 2' 4.04800976 W
8,901.00	82.70	14.30	8,653.18	460.51	162.66	548,932.96	633,476.56	2° 30' 31.39912194 N	104° 2' 3.97546479 W
8,932.00	86.90	13.40	8,655.99	490.48	170.05	548,962.92	633,483.94	2° 30' 31.69546473 N	104° 2' 3.88820843 W
8,964.00	88.00	12.90	8,657.42	521.61	177.32	548,994.05	633,491.22	2° 30' 32.00330406 N	104° 2' 3.80225818 W
8,996.00	88.40	11.70	8,658.42	552.86	184.14	549,025.30	633,498.03	2° 30' 32.31234290 N	104° 2' 3.72166646 W
9,027.00	89.90	9.80	8,658.88	583.31	189.92	549,055.75	633,503.81	2° 30' 32.61350350 N	104° 2' 3.65315677 W
9,122.00	91.60	6.60	8,657.64	677.32	203.46	549,149.76	633,517.36	2° 30' 33.54335172 N	104° 2' 3.49187514 W
9,217.00	92.40	6.40	8,654.32	771.65	214.21	549,244.09	633,528.11	2° 30' 34.47650411 N	104° 2' 3.36327090 W
9,312.00	90.10	6.80	8,652.25	865.99	225.13	549,338.43	633,539.02	2° 30' 35.40975470 N	104° 2' 3.23270222 W
9,407.00	89.50	7.60	8,652.58	960.24	237.03	549,432.68	633,550.93	2° 30' 36.34206453 N	104° 2' 3.09056725 W
9,502.00	89.20	7.30	8,653.66	1,054.43	249.35	549,526.87	633,563.25	2° 30' 37.27379526 N	104° 2' 2.94363872 W
9,597.00	89.40	6.00	8,654.82	1,148.78	260.35	549,621.22	633,574.25	2° 30' 38.20714543 N	104° 2' 2.81208080 W



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Running Buffalo 1 Federal Com Well 1H
Project:	Eddy County, New Mexico NAD83	TVD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Site:	Running Buffalo 1 Federal Com	MD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Well:	Running Buffalo 1 Federal Com Well 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,692.00	89.60	5.50	8,655.65	1,243.30	269.87	549,715.74	633,583.76	2° 30' 39.14218259 N	104° 2' 2.69783376 W
9,788.00	89.80	5.10	8,656.15	1,338.89	278.74	549,811.33	633,592.63	2° 30' 40.08782546 N	104° 2' 2.59114234 W
9,882.00	90.20	5.10	8,656.15	1,432.52	287.09	549,904.96	633,600.99	2° 30' 41.01408388 N	104° 2' 2.49048672 W
9,978.00	90.20	4.80	8,655.82	1,528.16	295.38	550,000.60	633,609.27	2° 30' 41.96026973 N	104° 2' 2.39061252 W
10,072.00	88.90	5.70	8,656.55	1,621.76	303.98	550,094.20	633,617.87	2° 30' 42.88624556 N	104° 2' 2.28710119 W
10,135.00	89.30	6.00	8,657.54	1,684.42	310.40	550,156.86	633,624.29	2° 30' 43.50615705 N	104° 2' 2.21006453 W
10,199.00	90.50	6.70	8,657.66	1,748.03	317.48	550,220.47	633,631.37	2° 30' 44.13536897 N	104° 2' 2.12531341 W
10,262.00	90.70	7.00	8,657.00	1,810.57	324.99	550,283.02	633,638.88	2° 30' 44.75409013 N	104° 2' 2.03551321 W
10,357.00	91.30	7.50	8,655.34	1,904.80	336.98	550,377.24	633,650.87	2° 30' 45.68616203 N	104° 2' 1.89243087 W
10,452.00	91.50	6.50	8,653.02	1,999.06	348.55	550,471.50	633,662.44	2° 30' 46.61861240 N	104° 2' 1.75416897 W
10,547.00	90.90	6.60	8,651.03	2,093.42	359.38	550,565.86	633,673.28	2° 30' 47.55203593 N	104° 2' 1.62454255 W
10,642.00	90.70	6.40	8,649.70	2,187.80	370.14	550,660.24	633,684.03	2° 30' 48.48567210 N	104° 2' 1.49586077 W
10,737.00	90.20	6.60	8,648.96	2,282.19	380.89	550,754.63	633,694.79	2° 30' 49.41936791 N	104° 2' 1.36716988 W
10,832.00	90.20	6.30	8,648.62	2,376.58	391.56	550,849.03	633,705.46	2° 30' 50.35318392 N	104° 2' 1.23943650 W
10,927.00	91.10	6.00	8,647.55	2,471.03	401.74	550,943.47	633,715.63	2° 30' 51.28748968 N	104° 2' 1.11748283 W
11,022.00	90.70	6.50	8,646.05	2,565.45	412.08	551,037.90	633,725.98	2° 30' 52.22156426 N	104° 2' 0.99361060 W
11,116.00	90.60	6.90	8,644.99	2,658.80	423.05	551,131.25	633,736.94	2° 30' 53.14501960 N	104° 2' 0.86247026 W
11,211.00	90.70	7.20	8,643.91	2,753.08	434.71	551,225.52	633,748.60	2° 30' 54.07759628 N	104° 2' 0.72320791 W
11,306.00	90.00	7.70	8,643.33	2,847.28	447.02	551,319.72	633,760.92	2° 30' 55.00936138 N	104° 2' 0.57625841 W
11,401.00	92.00	7.90	8,641.67	2,941.38	459.91	551,413.82	633,773.81	2° 30' 55.94018509 N	104° 2' 0.42262086 W
11,496.00	91.90	6.40	8,638.44	3,035.58	471.73	551,508.02	633,785.63	2° 30' 56.87204862 N	104° 2' 0.28151212 W
11,591.00	92.20	6.30	8,635.04	3,129.94	482.23	551,602.38	633,796.13	2° 30' 57.80545925 N	104° 2' 0.15577599 W
11,686.00	92.60	5.60	8,631.06	3,224.34	492.07	551,696.79	633,805.97	2° 30' 58.73936250 N	104° 2' 0.03776107 W
11,781.00	91.10	5.50	8,628.00	3,318.85	501.25	551,791.29	633,815.15	2° 30' 59.67425498 N	104° 1' 59.92740770 W
11,876.00	91.30	4.80	8,626.01	3,413.44	509.78	551,885.88	633,823.67	32° 31' 0.61008044 N	104° 1' 59.82472565 W
11,971.00	92.00	4.50	8,623.27	3,508.09	517.48	551,980.53	633,831.37	32° 31' 1.54644583 N	104° 1' 59.73170347 W
12,062.00	91.80	5.40	8,620.25	3,598.70	525.33	552,071.14	633,839.22	32° 31' 2.44285336 N	104° 1' 59.63706892 W
12,162.00	91.50	6.00	8,617.37	3,698.16	535.25	552,170.60	633,849.15	32° 31' 3.42681683 N	104° 1' 59.51784811 W
12,257.00	92.40	6.20	8,614.14	3,792.57	545.34	552,265.01	633,859.24	32° 31' 4.36073099 N	104° 1' 59.39690963 W
12,353.00	91.50	7.00	8,610.87	3,887.87	556.37	552,360.32	633,870.26	32° 31' 5.30352878 N	104° 1' 59.26498016 W
12,447.00	93.10	6.80	8,607.10	3,981.12	567.65	552,453.56	633,881.55	32° 31' 6.22587669 N	104° 1' 59.13012874 W
12,510.00	92.70	6.90	8,603.91	4,043.59	575.16	552,516.03	633,889.05	32° 31' 6.84383778 N	104° 1' 59.04042640 W
12,574.00	91.10	6.20	8,601.79	4,107.13	582.45	552,579.57	633,896.35	32° 31' 7.47244030 N	104° 1' 58.95312222 W
12,637.00	91.30	6.00	8,600.47	4,169.76	589.15	552,642.20	633,903.04	32° 31' 8.09200162 N	104° 1' 58.87288881 W
12,700.00	92.20	5.70	8,598.55	4,232.40	595.57	552,704.84	633,909.46	32° 31' 8.71169394 N	104° 1' 58.79586598 W
12,795.00	91.40	5.80	8,595.57	4,326.88	605.08	552,799.32	633,918.97	32° 31' 9.64629860 N	104° 1' 58.68164823 W
12,890.00	90.50	5.90	8,593.99	4,421.37	614.76	552,893.81	633,928.65	2° 31' 10.58106367 N	104° 1' 58.56546367 W
12,985.00	91.10	5.60	8,592.66	4,515.88	624.28	552,988.32	633,938.17	2° 31' 11.51604081 N	104° 1' 58.45119902 W
13,080.00	91.70	5.70	8,590.34	4,610.39	633.63	553,082.83	633,947.52	2° 31' 12.45099839 N	104° 1' 58.33888274 W
13,175.00	92.30	5.70	8,587.03	4,704.86	643.06	553,177.30	633,956.95	2° 31' 13.38558210 N	104° 1' 58.22563789 W
13,270.00	91.50	5.80	8,583.88	4,799.33	652.57	553,271.77	633,966.46	2° 31' 14.32013371 N	104° 1' 58.11142317 W
13,418.00	92.90	6.10	8,578.20	4,946.42	667.90	553,418.86	633,981.79	2° 31' 15.77523313 N	104° 1' 57.92753008 W
13,617.00	92.90	6.10	8,568.13	5,144.04	689.02	553,616.48	634,002.91	2° 31' 17.73018317 N	104° 1' 57.67434920 W
Survey projected to 13617.00 MD									



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Running Buffalo 1 Federal Com Well 1H
Project:	Eddy County, New Mexico NAD83	TVD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Site:	Running Buffalo 1 Federal Com	MD Reference:	RKB=3448.9+18 @ 3466.90usft (Patriot 6)
Well:	Running Buffalo 1 Federal Com Well 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	-0.35	0.49	Gyro
8,111.00	8,109.12	6.44	29.57	MWD surveys
8,630.00	8,557.33	219.40	97.77	330 Hard line intercept @ 8630 MD
13,617.00	8,568.13	5,144.04	689.02	Survey projected to 13617.00 MD