

WATER OIL CONSERVATION
ARTESIA DISTRICT

MAY 05 2016

RECEIVED

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Populus Federal 3H
COUNTY: Eddy Co., New Mexico
Sec. 20, T 25S, R 27E

15-43256

**STATE OF NEW MEXICO
DEVIATION REPORT**

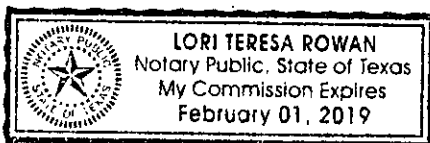
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
497	3/4	4,916	1
1,083	1/2	5,378	1 1/4
1,462	3/4	5,600	1 1/2
1,938	3/4	6,071	1 1/2
2,222	1/2	6,418	2 1/4
2,606	1/2	6,744	2 1/2
3,022	3/4	7,018	2 3/4
3,588	1/2	7,519	3/4
4,043	1	8,055	1/2
4,495	1/2	8,400	1 1/4

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 21st day of December 2015 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019



Lori T. Rowan
Notary Public for Ector Co., Texas



December 9, 2015

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

NM OIL CONSERVATION
ARTESIA DISTRICT
MAY 05 2016

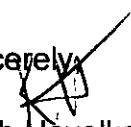
Attn: Kanicia Castillo

RECEIVED

RE: **Populus Federal 3H**

Please find enclosed a copy of the survey from 0' to 8600' ran on the above referenced well.

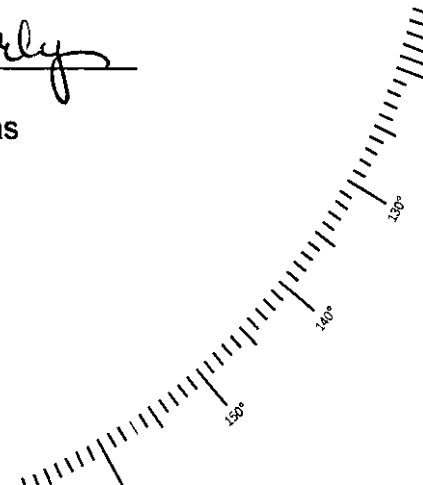
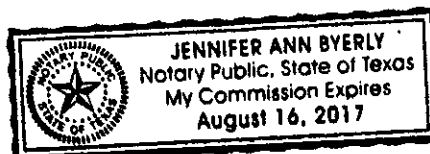
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 9 day of December
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho

Lease/Well: Populus Federal/3H

Location: 7 Miles from Malaga

Rig Name: Patriot 6

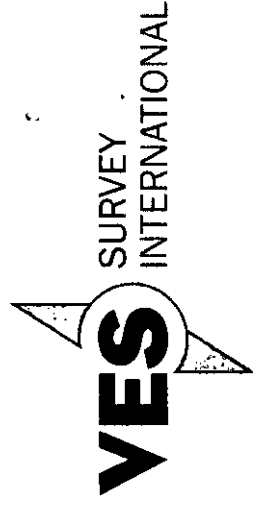
State/County: New Mexico/Eddy

VS-Azi: 0.00 Degrees

Latitude: 32.10829, Longitude: -104.21368

Grid North = True North -0.06 degs (NAD 27)

Grid Correction Applied = -0.06 degs



Depth Reference : RKB = 18 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: populus federal 3h_survey.ut

Minimum Curvature Method

Report Date/Time: 12/9/2015 / 14:06

VES Survey International
West Texas

(432) 563-5444

Surveyor: Gene Heiss

Populus Federal 3H / API 30-015-43256

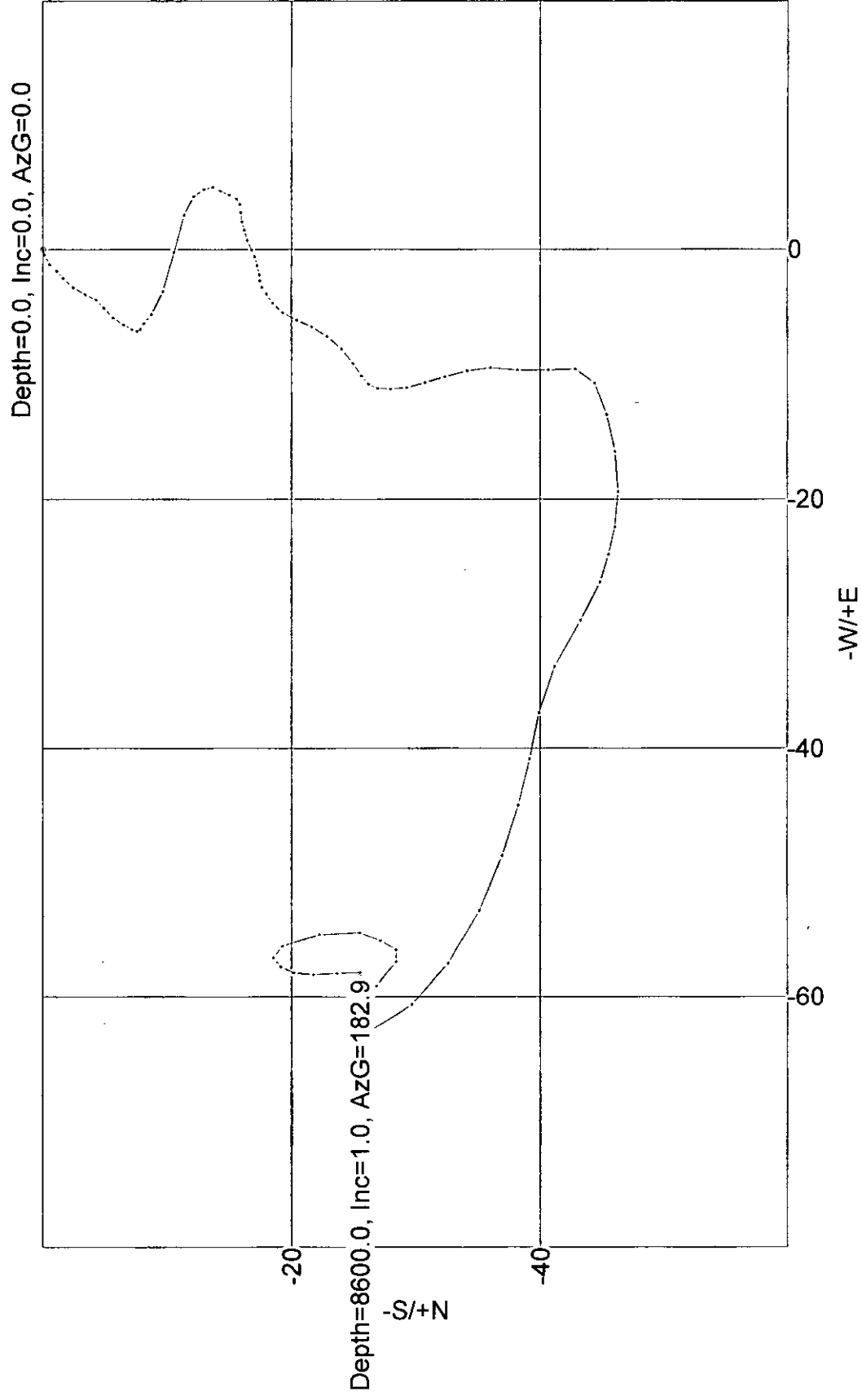
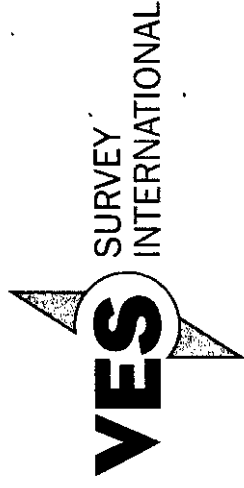
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.51	258.00	100.00	-0.09	-0.43	-0.09	0.44	258.00	0.51
200.00	0.56	222.93	199.99	-0.54	-1.20	-0.54	1.32	245.68	0.33
300.00	0.34	221.55	299.99	-1.12	-1.73	-1.12	2.07	237.02	0.22
400.00	0.54	232.00	399.99	-1.64	-2.30	-1.64	2.82	234.58	0.21
500.00	0.72	218.15	499.98	-2.42	-3.06	-2.42	3.90	231.67	0.23
600.00	0.62	199.40	599.98	-3.42	-3.62	-3.42	4.98	226.68	0.24
700.00	0.47	214.72	699.97	-4.26	-4.04	-4.26	5.87	223.45	0.20
800.00	0.59	235.63	799.97	-4.89	-4.70	-4.89	6.78	223.84	0.23
900.00	0.67	217.66	899.96	-5.64	-5.48	-5.64	7.87	224.16	0.21
1000.00	0.51	208.43	999.96	-6.50	-6.05	-6.50	8.88	222.95	0.18
1100.00	0.36	208.46	1099.95	-7.16	-6.41	-7.16	9.61	221.82	0.15
1200.00	0.17	186.12	1199.95	-7.59	-6.57	-7.59	10.04	220.91	0.21
1300.00	0.24	119.30	1299.95	-7.84	-6.40	-7.84	10.12	219.24	0.24
1400.00	0.37	123.61	1399.95	-8.12	-5.95	-8.12	10.07	216.24	0.13
1500.00	0.73	133.05	1499.95	-8.73	-5.22	-8.73	10.17	210.87	0.37
1600.00	1.68	109.33	1599.92	-9.65	-3.38	-9.65	10.22	199.28	1.05

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
1700.00	2.08	103.41	1699.87	-10.56	-0.23	-10.56	10.56	181.27	0.44
1800.00	1.47	107.08	1799.82	-11.35	2.75	-11.35	11.68	166.37	0.62
1900.00	0.56	145.04	1899.80	-12.13	4.26	-12.13	12.85	160.66	1.08
2000.00	0.60	148.92	1999.80	-12.98	4.81	-12.98	13.84	159.67	0.06
2100.00	0.31	197.71	2099.80	-13.68	4.99	-13.68	14.57	159.95	0.46
2200.00	0.45	212.83	2199.79	-14.27	4.70	-14.27	15.03	161.78	0.17
2300.00	0.48	199.29	2299.79	-15.00	4.35	-15.00	15.61	163.83	0.11
2400.00	0.30	220.60	2399.79	-15.59	4.04	-15.59	16.11	165.48	0.23
2500.00	0.29	255.57	2499.79	-15.86	3.62	-15.86	16.26	167.12	0.18
2600.00	0.48	269.78	2599.79	-15.92	2.97	-15.92	16.19	169.44	0.21
2700.00	0.38	254.50	2699.78	-16.01	2.23	-16.01	16.16	172.06	0.15
2800.00	0.44	254.20	2799.78	-16.20	1.54	-16.20	16.28	174.57	0.06
2900.00	0.52	255.28	2899.78	-16.42	0.73	-16.42	16.44	177.46	0.08
3000.00	0.45	232.79	2999.77	-16.78	-0.03	-16.78	16.78	180.09	0.20
3100.00	0.26	267.90	3099.77	-17.03	-0.57	-17.03	17.04	181.92	0.28
3200.00	0.61	249.37	3199.77	-17.22	-1.30	-17.22	17.27	184.30	0.37
3300.00	0.27	270.06	3299.77	-17.41	-2.02	-17.41	17.53	186.63	0.37
3400.00	0.33	264.48	3399.76	-17.44	-2.54	-17.44	17.62	188.29	0.06
3500.00	0.31	235.37	3499.76	-17.62	-3.05	-17.62	17.88	189.81	0.16
3600.00	0.42	234.91	3599.76	-17.98	-3.57	-17.98	18.33	191.23	0.11
3700.00	0.60	236.42	3699.76	-18.48	-4.31	-18.48	18.98	193.11	0.18
3800.00	0.71	213.89	3799.75	-19.28	-5.09	-19.28	19.94	194.78	0.28
3900.00	0.76	201.33	3899.74	-20.42	-5.67	-20.42	21.19	195.53	0.17
4000.00	0.75	207.10	3999.73	-21.62	-6.21	-21.62	22.49	196.03	0.08
4100.00	0.90	214.22	4099.72	-22.84	-6.95	-22.84	23.88	196.92	0.18
4200.00	0.90	228.24	4199.71	-24.01	-7.97	-24.01	25.30	198.37	0.22
4300.00	0.82	234.99	4299.70	-24.95	-9.14	-24.95	26.57	200.13	0.13
4400.00	0.57	236.94	4399.69	-25.63	-10.15	-25.63	27.56	201.60	0.25
4500.00	0.40	220.84	4499.69	-26.17	-10.79	-26.17	28.30	202.42	0.21
4600.00	0.56	191.57	4599.68	-26.91	-11.12	-26.91	29.12	202.46	0.28
4700.00	0.64	177.50	4699.68	-27.94	-11.20	-27.94	30.10	201.83	0.17
4800.00	0.86	173.74	4799.67	-29.25	-11.09	-29.25	31.28	200.76	0.22
4900.00	0.93	156.24	4899.66	-30.74	-10.68	-30.74	32.54	199.16	0.28
5000.00	0.97	169.45	4999.65	-32.32	-10.20	-32.32	33.89	197.51	0.22
5100.00	1.16	162.61	5099.63	-34.11	-9.74	-34.11	35.48	195.93	0.23
5200.00	1.05	183.42	5199.61	-35.99	-9.49	-35.99	37.22	194.77	0.41
5300.00	1.47	185.93	5299.59	-38.17	-9.68	-38.17	39.38	194.23	0.43
5400.00	1.37	173.75	5399.56	-40.63	-9.68	-40.63	41.77	193.40	0.32
5500.00	1.17	181.87	5499.53	-42.84	-9.58	-42.84	43.90	192.61	0.27

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
5600.00	1.39	243.86	5599.51	-44.39	-10.70	-44.39	45.66	193.56	1.33
5700.00	1.70	253.25	5699.47	-45.35	-13.21	-45.35	47.24	196.24	0.40
5800.00	1.81	259.96	5799.43	-46.05	-16.19	-46.05	48.82	199.37	0.23
5900.00	1.90	271.25	5899.37	-46.29	-19.40	-46.29	50.20	202.74	0.37
6000.00	1.38	281.41	5999.33	-46.02	-22.24	-46.02	51.11	205.79	0.59
6100.00	1.21	285.29	6099.31	-45.50	-24.44	-45.50	51.65	208.24	0.19
6200.00	1.46	288.44	6199.28	-44.82	-26.67	-44.82	52.15	210.75	0.26
6300.00	2.49	302.24	6299.22	-43.26	-29.71	-43.26	52.48	214.49	1.13
6400.00	2.41	296.62	6399.13	-41.16	-33.43	-41.16	53.02	219.09	0.25
6500.00	2.14	280.03	6499.05	-39.89	-37.15	-39.89	54.51	222.96	0.71
6600.00	2.18	282.93	6598.98	-39.14	-40.84	-39.14	56.56	226.21	0.12
6700.00	2.22	284.68	6698.91	-38.22	-44.57	-38.22	58.71	229.38	0.08
6800.00	2.62	290.32	6798.82	-36.94	-48.58	-36.94	61.03	232.75	0.46
6900.00	2.89	294.54	6898.70	-35.10	-53.02	-35.10	63.59	236.50	0.34
7000.00	2.81	306.71	6998.58	-32.58	-57.29	-32.58	65.90	240.37	0.61
7100.00	2.30	315.96	7098.48	-29.67	-60.65	-29.67	67.52	243.93	0.66
7200.00	2.01	340.91	7198.41	-26.57	-62.62	-26.57	68.02	247.00	0.97
7300.00	1.64	111.66	7298.39	-25.45	-61.86	-25.45	66.89	247.64	3.32
7400.00	1.87	120.91	7398.34	-26.81	-59.14	-26.81	64.93	245.61	0.36
7500.00	1.07	142.49	7498.31	-28.39	-57.17	-28.39	63.83	243.59	0.96
7600.00	0.95	27.39	7598.30	-28.39	-56.22	-28.39	62.98	243.21	1.71
7700.00	0.74	34.82	7698.29	-27.12	-55.47	-27.12	61.74	243.94	0.24
7800.00	1.34	14.81	7798.27	-25.46	-54.80	-25.46	60.43	245.08	0.70
7900.00	2.44	347.56	7898.22	-22.25	-54.96	-22.25	59.29	247.96	1.39
8000.00	1.21	331.03	7998.17	-19.26	-55.93	-19.26	59.15	251.00	1.33
8100.00	0.53	242.54	8098.16	-18.55	-56.85	-18.55	59.80	251.93	1.30
8200.00	0.58	221.56	8198.15	-19.14	-57.59	-19.14	60.69	251.62	0.21
8300.00	0.79	193.46	8298.15	-20.19	-58.09	-20.19	61.50	250.84	0.39
8400.00	1.02	179.86	8398.13	-21.75	-58.25	-21.75	62.18	249.52	0.32
8500.00	1.17	173.57	8498.12	-23.66	-58.13	-23.66	62.76	247.86	0.19
8600.00	0.96	182.88	8598.10	-25.50	-58.06	-25.50	63.41	246.29	0.27

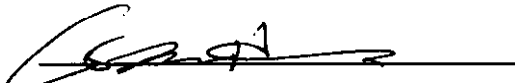


VES Survey International
West Texas
(432) 563-5444
Surveyor: Gene Heiss
Populus Federal 3H / API 30-015-43256





I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 12/07/15 through 12/07/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 8,600.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Populus Federal Well # 3H API # 30-015-43256 in Eddy County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services


Gene Heiss
Service Technician
Vaughn Energy Services



COG Operating LLC.

Eddy County, NM

Populas Federal

#3H

OH

Survey: MWD #1

Survey Report - Geographic

21 December, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, NM	TVD Reference:	WELL@ @ 3152.7usft (18' KB)
Site:	Populas Federal	MD Reference:	WELL@ @ 3152.7usft (18' KB)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Populas Federal				
Site Position:		Northing:	403,141.00 usft	Latitude:	32° 6' 29.859 N
From:	Map	Easting:	537,047.90 usft	Longitude:	104° 12' 49.252 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	#3H					
Well Position	+N/-S	0.0 usft	Northing:	403,141.00 usft	Latitude:	32° 6' 29.859 N
	+E/-W	0.0 usft	Easting:	537,047.90 usft	Longitude:	104° 12' 49.252 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,134.7 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/30/2014	7.46	59.89	48,142

Design	OH			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	180.42

Survey Program	Date 12/21/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	6,700.0	GYRO (OH)	NS-GYRO-SS	NS Gyro single shots	
6,700.0	12,119.0	MWD #1 (OH)	MWD	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,700.0	2.22	284.68	6,698.9	-38.3	-44.6	403,102.74	537,003.33	32° 6' 29.481 N	104° 12' 49.771 W
6,792.0	4.40	212.60	6,790.8	-40.8	-48.2	403,100.22	536,999.70	32° 6' 29.456 N	104° 12' 49.813 W
6,824.0	9.10	197.10	6,822.5	-44.2	-49.6	403,096.76	536,998.30	32° 6' 29.422 N	104° 12' 49.829 W
6,856.0	12.50	193.50	6,854.0	-50.0	-51.2	403,090.97	536,996.74	32° 6' 29.365 N	104° 12' 49.847 W
6,887.0	15.50	191.60	6,884.1	-57.3	-52.8	403,083.65	536,995.13	32° 6' 29.293 N	104° 12' 49.866 W
6,919.0	17.40	189.30	6,914.7	-66.3	-54.4	403,074.74	536,993.49	32° 6' 29.204 N	104° 12' 49.885 W
6,951.0	19.30	185.90	6,945.1	-76.2	-55.7	403,064.76	536,992.18	32° 6' 29.106 N	104° 12' 49.901 W
6,982.0	21.20	182.60	6,974.2	-86.9	-56.5	403,054.06	536,991.40	32° 6' 29.000 N	104° 12' 49.910 W
7,014.0	24.00	180.20	7,003.7	-99.2	-56.8	403,041.77	536,991.11	32° 6' 28.878 N	104° 12' 49.914 W
7,046.0	26.90	179.00	7,032.6	-113.0	-56.7	403,028.02	536,991.21	32° 6' 28.742 N	104° 12' 49.913 W
7,077.0	30.90	179.00	7,059.8	-128.0	-56.4	403,013.04	536,991.48	32° 6' 28.594 N	104° 12' 49.910 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, NM	TVD Reference:	WELL@ @ 3152.7usft (18' KB)
Site:	Populas Federal	MD Reference:	WELL@ @ 3152.7usft (18' KB)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,109.0	34.00	179.20	7,086.8	-145.1	-56.2	402,995.88	536,991.74	32° 6' 28.424 N	104° 12' 49.907 W
7,141.0	36.60	181.20	7,112.9	-163.6	-56.2	402,977.39	536,991.67	32° 6' 28.241 N	104° 12' 49.908 W
7,172.0	38.20	182.60	7,137.5	-182.4	-56.9	402,958.57	536,991.04	32° 6' 28.055 N	104° 12' 49.916 W
7,204.0	39.90	181.50	7,162.4	-202.6	-57.6	402,938.43	536,990.32	32° 6' 27.855 N	104° 12' 49.924 W
7,235.0	42.50	179.70	7,185.7	-223.0	-57.8	402,918.01	536,990.12	32° 6' 27.653 N	104° 12' 49.927 W
7,267.0	46.00	178.50	7,208.6	-245.3	-57.4	402,895.69	536,990.48	32° 6' 27.432 N	104° 12' 49.923 W
7,299.0	50.20	178.90	7,230.0	-269.1	-56.9	402,871.89	536,991.01	32° 6' 27.197 N	104° 12' 49.917 W
7,330.0	54.70	179.50	7,248.9	-293.7	-56.5	402,847.32	536,991.35	32° 6' 26.954 N	104° 12' 49.913 W
7,362.0	58.60	179.90	7,266.4	-320.4	-56.4	402,820.59	536,991.49	32° 6' 26.689 N	104° 12' 49.912 W
7,394.0	60.40	180.10	7,282.7	-348.0	-56.4	402,793.02	536,991.49	32° 6' 26.416 N	104° 12' 49.912 W
7,425.0	63.80	181.20	7,297.2	-375.4	-56.7	402,765.63	536,991.18	32° 6' 26.145 N	104° 12' 49.916 W
7,457.0	68.20	181.30	7,310.2	-404.6	-57.4	402,736.41	536,990.54	32° 6' 25.856 N	104° 12' 49.924 W
7,489.0	70.60	181.20	7,321.5	-434.5	-58.0	402,706.47	536,989.88	32° 6' 25.560 N	104° 12' 49.932 W
7,521.0	71.40	180.40	7,331.9	-464.8	-58.4	402,676.21	536,989.46	32° 6' 25.260 N	104° 12' 49.938 W
7,552.0	72.30	180.40	7,341.5	-494.2	-58.6	402,646.76	536,989.26	32° 6' 24.969 N	104° 12' 49.940 W
7,584.0	74.00	180.20	7,350.8	-524.9	-58.8	402,616.13	536,989.10	32° 6' 24.666 N	104° 12' 49.943 W
7,616.0	76.30	180.10	7,359.0	-555.8	-58.9	402,585.20	536,989.02	32° 6' 24.360 N	104° 12' 49.944 W
7,647.0	77.90	180.20	7,365.9	-586.0	-59.0	402,554.99	536,988.94	32° 6' 24.061 N	104° 12' 49.945 W
7,679.0	78.70	180.50	7,372.4	-617.3	-59.2	402,523.65	536,988.74	32° 6' 23.751 N	104° 12' 49.948 W
7,711.0	78.80	180.90	7,378.7	-648.7	-59.5	402,492.27	536,988.36	32° 6' 23.440 N	104° 12' 49.953 W
7,742.0	79.30	181.00	7,384.6	-679.2	-60.0	402,461.84	536,987.86	32° 6' 23.139 N	104° 12' 49.959 W
7,774.0	81.30	180.90	7,389.9	-710.7	-60.6	402,430.30	536,987.33	32° 6' 22.827 N	104° 12' 49.965 W
7,806.0	83.30	180.40	7,394.2	-742.4	-60.9	402,398.59	536,986.97	32° 6' 22.513 N	104° 12' 49.970 W
7,837.0	84.10	180.30	7,397.6	-773.2	-61.1	402,367.78	536,986.79	32° 6' 22.208 N	104° 12' 49.973 W
7,869.0	85.10	179.90	7,400.6	-805.1	-61.2	402,335.93	536,986.73	32° 6' 21.893 N	104° 12' 49.974 W
7,901.0	85.90	179.80	7,403.2	-837.0	-61.1	402,304.02	536,986.81	32° 6' 21.577 N	104° 12' 49.973 W
7,932.0	88.40	179.00	7,404.7	-867.9	-60.8	402,273.07	536,987.14	32° 6' 21.271 N	104° 12' 49.970 W
7,964.0	90.30	179.30	7,405.1	-899.9	-60.3	402,241.07	536,987.61	32° 6' 20.954 N	104° 12' 49.965 W
7,996.0	91.10	179.00	7,404.7	-931.9	-59.8	402,209.08	536,988.09	32° 6' 20.637 N	104° 12' 49.959 W
8,091.0	89.40	180.90	7,404.3	-1,026.9	-59.7	402,114.09	536,988.17	32° 6' 19.697 N	104° 12' 49.960 W
8,186.0	89.10	180.70	7,405.5	-1,121.9	-61.1	402,019.11	536,986.84	32° 6' 18.757 N	104° 12' 49.976 W
8,281.0	90.70	180.80	7,405.7	-1,216.9	-62.3	401,924.12	536,985.60	32° 6' 17.817 N	104° 12' 49.992 W
8,376.0	89.80	179.00	7,405.2	-1,311.9	-62.1	401,829.12	536,985.77	32° 6' 16.877 N	104° 12' 49.991 W
8,471.0	88.60	180.10	7,406.6	-1,406.9	-61.4	401,734.14	536,986.51	32° 6' 15.937 N	104° 12' 49.984 W
8,566.0	90.10	180.50	7,407.7	-1,501.8	-61.9	401,639.15	536,986.02	32° 6' 14.997 N	104° 12' 49.991 W
8,661.0	89.00	180.60	7,408.4	-1,596.8	-62.8	401,544.16	536,985.10	32° 6' 14.057 N	104° 12' 50.003 W
8,756.0	90.40	180.60	7,408.9	-1,691.8	-63.8	401,449.17	536,984.11	32° 6' 13.117 N	104° 12' 50.016 W
8,852.0	88.20	179.90	7,410.4	-1,817.8	-64.3	401,323.19	536,983.56	32° 6' 11.870 N	104° 12' 50.024 W
8,977.0	89.70	179.40	7,412.2	-1,912.8	-63.8	401,228.21	536,984.14	32° 6' 10.930 N	104° 12' 50.018 W
9,072.0	88.80	178.20	7,413.4	-2,007.8	-61.8	401,133.24	536,986.13	32° 6' 9.990 N	104° 12' 49.996 W
9,167.0	90.60	178.10	7,413.9	-2,102.7	-58.7	401,038.29	536,989.20	32° 6' 9.051 N	104° 12' 49.962 W
9,262.0	89.60	179.00	7,413.7	-2,197.7	-56.3	400,943.33	536,991.60	32° 6' 8.111 N	104° 12' 49.935 W
9,325.0	90.50	179.40	7,413.7	-2,260.7	-55.4	400,880.33	536,992.48	32° 6' 7.487 N	104° 12' 49.926 W
9,420.0	89.80	179.20	7,413.4	-2,355.7	-54.3	400,785.34	536,993.64	32° 6' 6.547 N	104° 12' 49.913 W
9,515.0	89.20	178.60	7,414.3	-2,450.6	-52.4	400,690.36	536,995.46	32° 6' 5.607 N	104° 12' 49.893 W
9,610.0	90.80	178.80	7,414.3	-2,545.6	-50.3	400,595.39	536,997.62	32° 6' 4.667 N	104° 12' 49.869 W
9,705.0	89.90	179.20	7,413.7	-2,640.6	-48.6	400,500.41	536,999.28	32° 6' 3.727 N	104° 12' 49.851 W
9,800.0	90.10	179.60	7,413.7	-2,735.6	-47.6	400,405.41	537,000.27	32° 6' 2.787 N	104° 12' 49.841 W
9,895.0	88.40	179.60	7,414.9	-2,830.6	-47.0	400,310.43	537,000.93	32° 6' 1.847 N	104° 12' 49.835 W
9,990.0	89.90	179.50	7,416.3	-2,925.6	-46.2	400,215.44	537,001.68	32° 6' 0.907 N	104° 12' 49.827 W
10,085.0	89.20	179.80	7,417.1	-3,020.5	-45.6	400,120.45	537,002.26	32° 5' 59.967 N	104° 12' 49.822 W
10,180.0	90.50	180.40	7,417.3	-3,115.5	-45.8	400,025.45	537,002.09	32° 5' 59.027 N	104° 12' 49.825 W
10,275.0	89.80	179.30	7,417.1	-3,210.5	-45.6	399,930.45	537,002.34	32° 5' 58.087 N	104° 12' 49.823 W
10,370.0	89.00	178.90	7,418.1	-3,305.5	-44.1	399,835.47	537,003.84	32° 5' 57.147 N	104° 12' 49.807 W
10,465.0	89.80	178.90	7,419.1	-3,400.5	-42.2	399,740.50	537,005.66	32° 5' 56.207 N	104° 12' 49.787 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC.	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, NM	TVD Reference:	WELL@ @ 3152.7usft (18' KB)
Site:	Populas Federal	MD Reference:	WELL@ @ 3152.7usft (18' KB)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,560.0	91.40	177.90	7,418.1	-3,495.5	-39.6	399,645.54	537,008.31	32° 5' 55.267 N	104° 12' 49.757 W
10,654.0	91.20	180.30	7,416.0	-3,589.4	-38.1	399,551.59	537,009.79	32° 5' 54.337 N	104° 12' 49.741 W
10,749.0	90.20	181.30	7,414.8	-3,684.4	-39.4	399,456.60	537,008.46	32° 5' 53.397 N	104° 12' 49.758 W
10,844.0	89.80	179.50	7,414.8	-3,779.4	-40.1	399,361.81	537,007.80	32° 5' 52.457 N	104° 12' 49.767 W
10,939.0	91.50	179.20	7,413.7	-3,874.4	-39.0	399,266.63	537,008.88	32° 5' 51.517 N	104° 12' 49.756 W
11,059.0	88.70	177.50	7,413.5	-3,994.3	-35.6	399,146.69	537,012.33	32° 5' 50.330 N	104° 12' 49.717 W
11,154.0	89.70	179.70	7,414.8	-4,089.3	-33.3	399,051.74	537,014.65	32° 5' 49.390 N	104° 12' 49.691 W
11,249.0	90.40	179.50	7,414.8	-4,184.3	-32.6	398,956.74	537,015.31	32° 5' 48.450 N	104° 12' 49.685 W
11,344.0	90.60	179.80	7,413.9	-4,279.3	-32.0	398,861.75	537,015.89	32° 5' 47.510 N	104° 12' 49.679 W
11,471.0	90.00	179.10	7,413.3	-4,406.2	-30.8	398,734.75	537,017.11	32° 5' 46.253 N	104° 12' 49.667 W
11,566.0	90.00	179.00	7,413.3	-4,501.2	-29.2	398,639.77	537,018.69	32° 5' 45.313 N	104° 12' 49.650 W
11,661.0	88.50	179.80	7,414.5	-4,596.2	-28.2	398,544.78	537,019.68	32° 5' 44.373 N	104° 12' 49.639 W
11,756.0	89.50	179.70	7,416.2	-4,691.2	-27.8	398,449.80	537,020.10	32° 5' 43.433 N	104° 12' 49.636 W
11,851.0	88.10	179.70	7,418.1	-4,786.2	-27.3	398,354.83	537,020.59	32° 5' 42.493 N	104° 12' 49.631 W
11,946.0	89.80	180.40	7,419.9	-4,881.2	-27.4	398,259.85	537,020.51	32° 5' 41.553 N	104° 12' 49.633 W
12,075.0	91.70	180.90	7,418.2	-5,010.1	-28.9	398,130.87	537,019.05	32° 5' 40.277 N	104° 12' 49.652 W
12,119.0	91.70	180.90	7,416.9	-5,054.1	-29.5	398,086.90	537,018.36	32° 5' 39.842 N	104° 12' 49.661 W
PBH(Pop#3H)									

Checked By: _____	Approved By: _____	Date: _____
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