

September 25, 2014

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

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 21 2015

RECEIVED

Attn: Kanicia Castillo

3001542458

RE: Black River State No. 004H

Please find enclosed a copy of the survey from 0.00' to 8848.00' ran on the
above referenced well.

Sincerely,

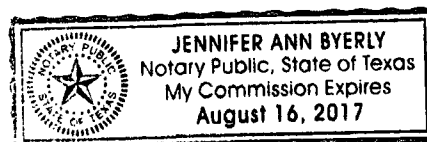
Keith Havelka
Operations

STATE OF TEXAS §

COUNTY OF NUECES §

This instrument was acknowledged before me on the 25 day of September
A.D., 2014, by Keith Havelka.

Jennifer Ann Byerly
Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)

Lease/Well: Black River State/No. 004H

Location: S5 T24S R27E

Rig Name: Latshaw 6

State/County: New Mexico/Eddy

Latitude: 32.24, Longitude: -104.22

GRID North is 0.06 Degrees East of True North

VS-Azi: 89.60 Degrees



RECEIVED
JAN 21 2015
ARTESIA DISTRICT
NM OIL CONSERVATION

Depth Reference : RKB = 22 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 9/25/2014 / 16:11

VES Survey International

Midland, TX

432-563-5444

Surveyor: Andrew Askew

Black River State No. 004H / API 30-015-42458

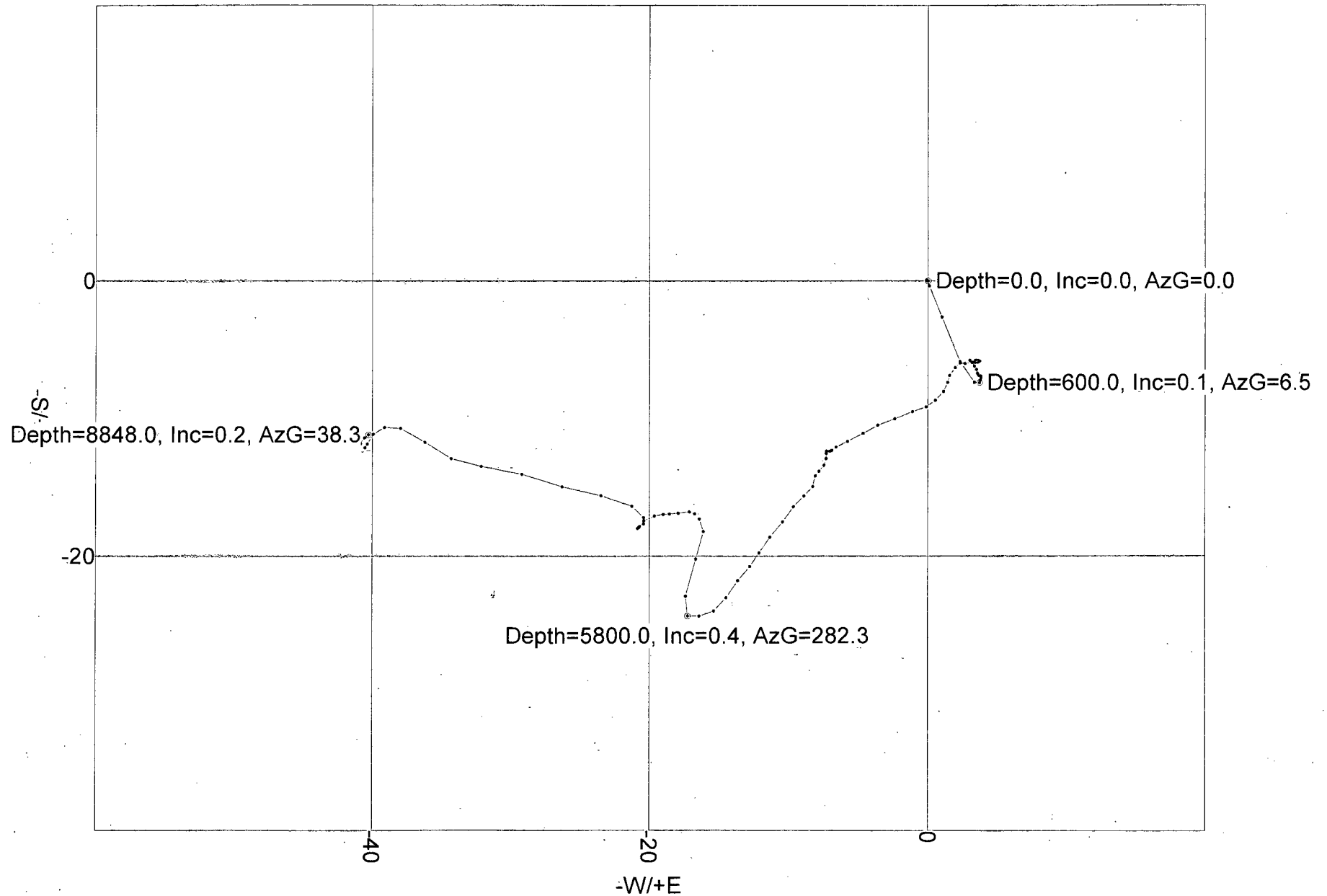
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.13	290.82	100.00	0.04	-0.10	-0.10	0.11	290.82	0.13
200.00	0.62	146.64	200.00	-0.38	0.09	0.09	0.39	166.02	0.73
300.00	2.19	161.30	299.97	-2.64	1.01	0.99	2.83	159.16	1.60
400.00	1.79	154.01	399.90	-5.86	2.31	2.26	6.30	158.53	0.47
500.00	0.43	104.89	499.88	-7.37	3.35	3.30	8.09	155.52	1.55
600.00	0.08	6.55	599.88	-7.39	3.72	3.67	8.28	153.27	0.45
700.00	0.11	15.95	699.88	-7.23	3.76	3.71	8.15	152.53	0.04
800.00	0.10	23.15	799.88	-7.05	3.82	3.77	8.02	151.55	0.02
900.00	0.09	315.03	899.88	-6.91	3.80	3.75	7.89	151.21	0.11
1000.00	0.11	268.17	999.88	-6.86	3.65	3.60	7.77	152.01	0.08
1100.00	0.18	7.57	1099.88	-6.71	3.57	3.52	7.60	151.97	0.23
1200.00	0.16	321.72	1199.88	-6.44	3.50	3.46	7.33	151.46	0.13
1300.00	0.16	335.41	1299.88	-6.20	3.36	3.31	7.05	151.57	0.04
1400.00	0.20	318.85	1399.88	-5.94	3.18	3.14	6.74	151.82	0.06
1500.00	0.08	305.79	1499.88	-5.76	3.01	2.97	6.50	152.44	0.12
1600.00	0.13	125.76	1599.88	-5.79	3.04	3.00	6.54	152.30	0.21
1700.00	0.13	128.01	1699.88	-5.92	3.22	3.18	6.74	151.47	0.01
1800.00	0.15	54.27	1799.88	-5.92	3.42	3.38	6.83	149.99	0.17

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	0.12	53.64	1899.88	-5.78	3.61	3.57	6.81	148.04	0.03
2000.00	0.14	155.30	1999.88	-5.83	3.74	3.70	6.93	147.32	0.20
2100.00	0.23	278.52	2099.88	-5.91	3.59	3.55	6.92	148.71	0.33
2200.00	0.11	12.35	2199.88	-5.79	3.42	3.38	6.72	149.47	0.26
2300.00	0.11	144.06	2299.88	-5.78	3.49	3.45	6.76	148.85	0.20
2400.00	0.37	262.74	2399.88	-5.90	3.24	3.19	6.73	151.27	0.43
2500.00	0.30	257.26	2499.88	-6.00	2.66	2.62	6.56	156.09	0.07
2600.00	0.16	316.50	2599.88	-5.96	2.31	2.27	6.39	158.84	0.26
2700.00	0.58	209.75	2699.87	-6.30	1.96	1.92	6.60	162.71	0.64
2800.00	0.24	231.65	2799.87	-6.87	1.55	1.50	7.04	167.30	0.37
2900.00	0.43	176.33	2899.87	-7.37	1.41	1.36	7.50	169.17	0.35
3000.00	0.49	227.59	2999.87	-8.03	1.12	1.06	8.11	172.05	0.40
3100.00	0.53	217.24	3099.86	-8.68	0.53	0.47	8.70	176.52	0.10
3200.00	0.45	254.99	3199.86	-9.15	-0.13	-0.19	9.15	180.79	0.32
3300.00	0.74	245.96	3299.86	-9.51	-1.09	-1.16	9.58	186.56	0.31
3400.00	0.84	250.01	3399.85	-10.03	-2.37	-2.44	10.30	193.32	0.11
3500.00	0.62	247.92	3499.84	-10.48	-3.57	-3.64	11.07	198.79	0.21
3600.00	0.77	235.09	3599.83	-11.07	-4.63	-4.70	12.00	202.67	0.22
3700.00	0.69	249.62	3699.82	-11.67	-5.74	-5.82	13.01	206.20	0.20
3800.00	0.38	234.13	3799.82	-12.07	-6.58	-6.66	13.75	208.57	0.34
3900.00	0.07	218.31	3899.82	-12.32	-6.88	-6.97	14.11	209.20	0.32
4000.00	0.13	257.53	3999.82	-12.39	-7.03	-7.11	14.24	209.57	0.09
4100.00	0.14	289.34	4099.82	-12.37	-7.26	-7.34	14.34	210.40	0.08
4200.00	0.27	155.20	4199.82	-12.54	-7.27	-7.36	14.50	210.12	0.38
4300.00	0.21	215.74	4299.82	-12.90	-7.29	-7.37	14.82	209.45	0.25
4400.00	0.40	188.96	4399.81	-13.40	-7.45	-7.54	15.33	209.06	0.23
4500.00	0.35	252.97	4499.81	-13.84	-7.79	-7.89	15.88	209.39	0.40
4600.00	0.29	175.01	4599.81	-14.18	-8.06	-8.16	16.31	209.63	0.40
4700.00	0.63	202.51	4699.81	-14.94	-8.25	-8.36	17.06	208.93	0.40
4800.00	0.53	246.94	4799.80	-15.62	-8.89	-9.00	17.97	209.63	0.45
4900.00	0.78	209.45	4899.80	-16.40	-9.65	-9.76	19.03	210.47	0.49
5000.00	0.77	220.94	4999.79	-17.51	-10.43	-10.55	20.38	210.78	0.16
5100.00	0.87	217.96	5099.78	-18.61	-11.34	-11.47	21.79	211.34	0.11
5200.00	0.72	208.90	5199.77	-19.77	-12.11	-12.25	23.18	211.49	0.19
5300.00	0.64	219.85	5299.76	-20.75	-12.77	-12.92	24.36	211.61	0.16
5400.00	0.91	219.35	5399.75	-21.79	-13.63	-13.78	25.70	212.03	0.27
5500.00	0.82	209.41	5499.74	-23.02	-14.48	-14.64	27.20	212.17	0.17
5600.00	0.72	237.98	5599.73	-23.98	-15.37	-15.54	28.49	212.65	0.39
5700.00	0.58	264.09	5699.73	-24.37	-16.41	-16.57	29.38	213.95	0.32

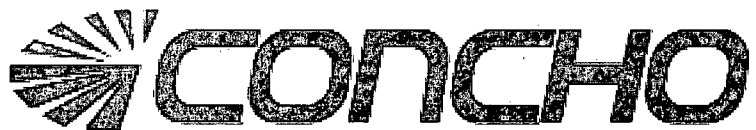
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.40	282.34	5799.72	-24.35	-17.24	-17.41	29.84	215.31	0.24
5900.00	1.58	8.38	5899.71	-22.91	-17.38	-17.54	28.76	217.19	1.60
6000.00	1.64	21.32	5999.67	-20.22	-16.66	-16.80	26.20	219.49	0.37
6100.00	0.78	1.56	6099.65	-18.21	-16.13	-16.25	24.32	221.52	0.94
6200.00	0.44	306.48	6199.64	-17.31	-16.42	-16.54	23.85	223.49	0.64
6300.00	0.19	356.21	6299.64	-16.91	-16.73	-16.85	23.79	224.70	0.35
6400.00	0.44	265.91	6399.64	-16.78	-17.13	-17.24	23.97	225.59	0.48
6500.00	0.49	260.28	6499.64	-16.87	-17.93	-18.04	24.62	226.73	0.07
6600.00	0.23	272.74	6599.63	-16.94	-18.55	-18.67	25.12	227.61	0.27
6700.00	0.28	261.96	6699.63	-16.96	-18.99	-19.11	25.47	228.24	0.06
6800.00	0.46	258.90	6799.63	-17.07	-19.63	-19.75	26.01	228.98	0.19
6900.00	0.52	234.87	6899.63	-17.41	-20.40	-20.52	26.82	229.51	0.21
7000.00	0.28	179.29	6999.62	-17.92	-20.77	-20.89	27.43	229.22	0.43
7100.00	0.24	333.86	7099.62	-17.97	-20.86	-20.98	27.53	229.25	0.50
7200.00	0.28	103.09	7199.62	-17.84	-20.71	-20.84	27.34	229.26	0.46
7300.00	0.28	17.35	7299.62	-17.66	-20.40	-20.53	26.99	229.12	0.38
7400.00	0.28	344.10	7399.62	-17.19	-20.40	-20.52	26.68	229.87	0.16
7500.00	1.12	307.35	7499.61	-16.37	-21.24	-21.36	26.81	232.39	0.91
7600.00	1.69	276.90	7599.58	-15.60	-23.48	-23.59	28.19	236.41	0.92
7700.00	1.60	289.44	7699.54	-14.96	-26.25	-26.36	30.22	240.33	0.37
7800.00	1.91	285.65	7799.50	-14.04	-29.17	-29.27	32.37	244.29	0.33
7900.00	1.55	274.88	7899.45	-13.48	-32.12	-32.21	34.83	247.23	0.48
8000.00	1.08	299.31	7999.43	-12.90	-34.29	-34.38	36.63	249.37	0.72
8100.00	1.48	304.28	8099.40	-11.72	-36.17	-36.25	38.02	252.05	0.42
8200.00	0.88	291.89	8199.38	-10.71	-37.94	-38.02	39.43	254.24	0.65
8300.00	0.55	241.92	8299.37	-10.65	-39.08	-39.15	40.50	254.76	0.67
8400.00	0.57	238.19	8399.37	-11.14	-39.92	-40.00	41.45	254.41	0.04
8500.00	0.52	181.93	8499.36	-11.85	-40.36	-40.44	42.06	253.64	0.51
8600.00	0.27	317.41	8599.36	-12.13	-40.53	-40.62	42.31	253.34	0.73
8700.00	0.23	306.56	8699.36	-11.83	-40.86	-40.94	42.54	253.85	0.06
8800.00	0.63	56.19	8799.36	-11.41	-40.57	-40.64	42.14	254.30	0.74
8848.00	0.23	38.29	8847.36	-11.19	-40.29	-40.37	41.81	254.48	0.87



VES Survey International
Midland, TX
432-563-5444
Surveyor: Andrew Askew
Black River State No. 004H / API 30-015-42458



V.E.S. Survey Date: 09/10/2014



COG Operating LLC

Eddy County, NM

Black River State

#4H

OH

Design: OH

Survey Report - Geographic

01 October, 2014





TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Black River State
Project:	Eddy County, NM	TVD Reference:	KB @ 3234.2usft
Site:	Black River State	MD Reference:	KB @ 3234.2usft
Well:	#4H	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	Black River State		
Site Position:		Northing:	451,348.10 usft
From:	Map	Easting:	535,087.50 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 14' 26.959 N
		Longitude:	104° 13' 11.454 W
		Grid Convergence:	0.06 °

Well	#4H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 14' 26.959 N
		Longitude:	104° 13' 11.454 W
		Ground Level:	3,212.2 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	9/4/2014	7.49
			Dip Angle
			(°)
			60.01
			Field Strength
			(nT)
			48,235

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	9,675.0	0.0	0.0
			Direction
			(°)
			89.34

Survey Program	Date	10/1/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	8,848.0	Gyro #1 (OH)	Good_gyro	Good Gyro
8,968.0	13,775.0	MWD #1 (OH)	MWD	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)		
0.0	0.00	0.00	0.0	0.0	0.0	451,348.10	535,087.50	32° 14' 26.959 N	104° 13' 11.454 W
100.0	0.13	290.82	100.0	0.0	-0.1	451,348.14	535,087.40	32° 14' 26.960 N	104° 13' 11.455 W
200.0	0.62	146.64	200.0	-0.4	0.1	451,347.73	535,087.59	32° 14' 26.956 N	104° 13' 11.453 W
300.0	2.19	161.30	300.0	-2.6	1.0	451,345.47	535,088.50	32° 14' 26.933 N	104° 13' 11.442 W
400.0	1.79	154.01	399.9	-5.8	2.3	451,342.25	535,089.79	32° 14' 26.901 N	104° 13' 11.427 W
500.0	0.43	104.89	499.9	-7.3	3.3	451,340.75	535,090.84	32° 14' 26.886 N	104° 13' 11.415 W
600.0	0.08	6.55	599.9	-7.4	3.7	451,340.73	535,091.21	32° 14' 26.886 N	104° 13' 11.411 W
700.0	0.11	15.95	699.9	-7.2	3.7	451,340.89	535,091.25	32° 14' 26.888 N	104° 13' 11.410 W
800.0	0.10	23.15	799.9	-7.0	3.8	451,341.06	535,091.31	32° 14' 26.890 N	104° 13' 11.410 W
900.0	0.09	315.03	899.9	-6.9	3.8	451,341.20	535,091.29	32° 14' 26.891 N	104° 13' 11.410 W
1,000.0	0.11	268.17	999.9	-6.9	3.6	451,341.25	535,091.13	32° 14' 26.891 N	104° 13' 11.412 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Black River State
Project:	Eddy County, NM	TVD Reference:	KB @ 3234.2usft
Site:	Black River State	MD Reference:	KB @ 3234.2usft
Well:	#4H	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
1,100.0	0.18	7.57	1,099.9	-6.7	3.6	451,341.40	535,091.06	32° 14' 26.893 N	104° 13' 11.413 W
1,200.0	0.16	321.72	1,199.9	-6.4	3.5	451,341.67	535,090.99	32° 14' 26.896 N	104° 13' 11.413 W
1,300.0	0.16	335.41	1,299.9	-6.2	3.3	451,341.90	535,090.85	32° 14' 26.898 N	104° 13' 11.415 W
1,400.0	0.20	318.85	1,399.9	-5.9	3.2	451,342.16	535,090.68	32° 14' 26.900 N	104° 13' 11.417 W
1,500.0	0.08	305.79	1,499.9	-5.8	3.0	451,342.33	535,090.50	32° 14' 26.902 N	104° 13' 11.419 W
1,600.0	0.13	125.76	1,599.9	-5.8	3.0	451,342.31	535,090.54	32° 14' 26.902 N	104° 13' 11.419 W
1,700.0	0.13	128.01	1,699.9	-5.9	3.2	451,342.17	535,090.72	32° 14' 26.901 N	104° 13' 11.417 W
1,800.0	0.15	54.27	1,799.9	-5.9	3.4	451,342.18	535,090.92	32° 14' 26.901 N	104° 13' 11.414 W
1,900.0	0.12	53.64	1,899.9	-5.8	3.6	451,342.32	535,091.11	32° 14' 26.902 N	104° 13' 11.412 W
2,000.0	0.14	155.30	1,999.9	-5.8	3.7	451,342.27	535,091.24	32° 14' 26.901 N	104° 13' 11.411 W
2,100.0	0.23	278.52	2,099.9	-5.9	3.6	451,342.19	535,091.10	32° 14' 26.901 N	104° 13' 11.412 W
2,200.0	0.11	12.35	2,199.9	-5.8	3.4	451,342.31	535,090.92	32° 14' 26.902 N	104° 13' 11.414 W
2,300.0	0.11	144.06	2,299.9	-5.8	3.5	451,342.33	535,090.99	32° 14' 26.902 N	104° 13' 11.413 W
2,400.0	0.37	262.74	2,399.9	-5.9	3.2	451,342.21	535,090.73	32° 14' 26.901 N	104° 13' 11.416 W
2,500.0	0.30	257.26	2,499.9	-6.0	2.7	451,342.11	535,090.15	32° 14' 26.900 N	104° 13' 11.423 W
2,600.0	0.16	316.50	2,599.9	-5.9	2.3	451,342.15	535,089.80	32° 14' 26.900 N	104° 13' 11.427 W
2,700.0	0.58	209.75	2,699.9	-6.3	2.0	451,341.81	535,089.46	32° 14' 26.897 N	104° 13' 11.431 W
2,800.0	0.24	231.65	2,799.9	-6.9	1.5	451,341.25	535,089.04	32° 14' 26.891 N	104° 13' 11.436 W
2,900.0	0.43	176.33	2,899.9	-7.4	1.4	451,340.74	535,088.90	32° 14' 26.886 N	104° 13' 11.438 W
3,000.0	0.49	227.59	2,999.9	-8.0	1.1	451,340.08	535,088.61	32° 14' 26.880 N	104° 13' 11.441 W
3,100.0	0.53	217.24	3,099.9	-8.7	0.5	451,339.42	535,088.01	32° 14' 26.873 N	104° 13' 11.448 W
3,200.0	0.45	254.99	3,199.9	-9.1	-0.1	451,338.95	535,087.35	32° 14' 26.869 N	104° 13' 11.456 W
3,300.0	0.74	245.96	3,299.9	-9.5	-1.1	451,338.59	535,086.39	32° 14' 26.865 N	104° 13' 11.467 W
3,400.0	0.84	250.01	3,399.8	-10.0	-2.4	451,338.07	535,085.11	32° 14' 26.860 N	104° 13' 11.482 W
3,500.0	0.62	247.92	3,499.8	-10.5	-3.6	451,337.62	535,083.92	32° 14' 26.856 N	104° 13' 11.496 W
3,600.0	0.77	235.09	3,599.8	-11.1	-4.6	451,337.03	535,082.86	32° 14' 26.850 N	104° 13' 11.508 W
3,700.0	0.69	249.62	3,699.8	-11.7	-5.8	451,336.44	535,081.75	32° 14' 26.844 N	104° 13' 11.521 W
3,800.0	0.38	234.13	3,799.8	-12.1	-6.6	451,336.03	535,080.92	32° 14' 26.840 N	104° 13' 11.531 W
3,900.0	0.07	218.31	3,899.8	-12.3	-6.9	451,335.79	535,080.61	32° 14' 26.837 N	104° 13' 11.534 W
4,000.0	0.13	257.53	3,999.8	-12.4	-7.0	451,335.72	535,080.46	32° 14' 26.837 N	104° 13' 11.536 W
4,100.0	0.14	289.34	4,099.8	-12.4	-7.3	451,335.73	535,080.23	32° 14' 26.837 N	104° 13' 11.539 W
4,200.0	0.27	155.20	4,199.8	-12.5	-7.3	451,335.56	535,080.22	32° 14' 26.835 N	104° 13' 11.539 W
4,300.0	0.21	215.74	4,299.8	-12.9	-7.3	451,335.20	535,080.21	32° 14' 26.832 N	104° 13' 11.539 W
4,400.0	0.40	188.96	4,399.8	-13.4	-7.5	451,334.70	535,080.05	32° 14' 26.827 N	104° 13' 11.541 W
4,500.0	0.35	252.97	4,499.8	-13.8	-7.8	451,334.27	535,079.70	32° 14' 26.822 N	104° 13' 11.545 W
4,600.0	0.29	175.01	4,599.8	-14.2	-8.1	451,333.93	535,079.43	32° 14' 26.819 N	104° 13' 11.548 W
4,700.0	0.63	202.51	4,699.8	-14.9	-8.3	451,333.17	535,079.24	32° 14' 26.812 N	104° 13' 11.550 W
4,800.0	0.53	246.94	4,799.8	-15.6	-8.9	451,332.48	535,078.61	32° 14' 26.805 N	104° 13' 11.558 W
4,900.0	0.78	209.45	4,899.8	-16.4	-9.7	451,331.71	535,077.85	32° 14' 26.797 N	104° 13' 11.567 W
5,000.0	0.77	220.94	4,999.8	-17.5	-10.4	451,330.61	535,077.07	32° 14' 26.786 N	104° 13' 11.576 W
5,100.0	0.87	217.96	5,099.8	-18.6	-11.3	451,329.50	535,076.16	32° 14' 26.775 N	104° 13' 11.586 W
5,200.0	0.72	208.90	5,199.8	-19.7	-12.1	451,328.35	535,075.39	32° 14' 26.764 N	104° 13' 11.595 W
5,300.0	0.64	219.85	5,299.8	-20.7	-12.8	451,327.37	535,074.73	32° 14' 26.754 N	104° 13' 11.603 W
5,400.0	0.91	219.35	5,399.8	-21.8	-13.6	451,326.33	535,073.87	32° 14' 26.744 N	104° 13' 11.613 W
5,500.0	0.82	209.41	5,499.7	-23.0	-14.5	451,325.09	535,073.02	32° 14' 26.732 N	104° 13' 11.623 W
5,600.0	0.72	237.98	5,599.7	-24.0	-15.4	451,324.14	535,072.13	32° 14' 26.722 N	104° 13' 11.633 W
5,700.0	0.58	264.09	5,699.7	-24.3	-16.4	451,323.75	535,071.10	32° 14' 26.718 N	104° 13' 11.645 W
5,800.0	0.40	282.34	5,799.7	-24.3	-17.3	451,323.77	535,070.25	32° 14' 26.719 N	104° 13' 11.655 W
5,900.0	1.58	8.38	5,899.7	-22.9	-17.4	451,325.21	535,070.11	32° 14' 26.733 N	104° 13' 11.657 W
6,000.0	1.64	21.32	5,999.7	-20.2	-16.7	451,327.91	535,070.83	32° 14' 26.760 N	104° 13' 11.648 W
6,100.0	0.78	1.56	6,099.6	-18.2	-16.1	451,329.92	535,071.37	32° 14' 26.779 N	104° 13' 11.642 W
6,200.0	0.44	306.48	6,199.6	-17.3	-16.4	451,330.83	535,071.08	32° 14' 26.788 N	104° 13' 11.645 W
6,300.0	0.19	356.21	6,299.6	-16.9	-16.7	451,331.22	535,070.76	32° 14' 26.792 N	104° 13' 11.649 W
6,400.0	0.44	265.91	6,399.6	-16.7	-17.1	451,331.36	535,070.37	32° 14' 26.794 N	104° 13' 11.654 W
6,500.0	0.49	260.28	6,499.6	-16.8	-17.9	451,331.26	535,069.56	32° 14' 26.793 N	104° 13' 11.663 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Black River State
Project:	Eddy County, NM	TVD Reference:	KB @ 3234.2usft
Site:	Black River State	MD Reference:	KB @ 3234.2usft
Well:	#4H	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
6,600.0	0.23	272.74	6,599.6	-16.9	-18.6	451,331.20	535,068.94	32° 14' 26.792 N	104° 13' 11.670 W
6,700.0	0.28	261.96	6,699.6	-16.9	-19.0	451,331.18	535,068.50	32° 14' 26.792 N	104° 13' 11.675 W
6,800.0	0.46	258.90	6,799.6	-17.0	-19.6	451,331.06	535,067.86	32° 14' 26.791 N	104° 13' 11.683 W
6,900.0	0.52	234.87	6,899.6	-17.4	-20.4	451,330.73	535,067.10	32° 14' 26.787 N	104° 13' 11.692 W
7,000.0	0.28	179.29	6,999.6	-17.9	-20.8	451,330.22	535,066.73	32° 14' 26.782 N	104° 13' 11.696 W
7,100.0	0.24	333.86	7,099.6	-17.9	-20.9	451,330.16	535,066.64	32° 14' 26.782 N	104° 13' 11.697 W
7,200.0	0.28	103.09	7,199.6	-17.8	-20.7	451,330.30	535,066.79	32° 14' 26.783 N	104° 13' 11.695 W
7,300.0	0.28	17.35	7,299.6	-17.6	-20.4	451,330.47	535,067.10	32° 14' 26.785 N	104° 13' 11.692 W
7,400.0	0.28	344.10	7,399.6	-17.2	-20.4	451,330.94	535,067.10	32° 14' 26.790 N	104° 13' 11.692 W
7,500.0	1.12	307.35	7,499.6	-16.3	-21.2	451,331.77	535,066.26	32° 14' 26.798 N	104° 13' 11.702 W
7,600.0	1.69	276.90	7,599.6	-15.6	-23.5	451,332.54	535,064.02	32° 14' 26.805 N	104° 13' 11.728 W
7,700.0	1.60	289.44	7,699.5	-14.9	-26.3	451,333.18	535,061.24	32° 14' 26.812 N	104° 13' 11.760 W
7,800.0	1.91	285.65	7,799.5	-14.0	-29.2	451,334.10	535,058.32	32° 14' 26.821 N	104° 13' 11.794 W
7,900.0	1.55	274.88	7,899.5	-13.4	-32.1	451,334.66	535,055.36	32° 14' 26.827 N	104° 13' 11.828 W
8,000.0	1.08	299.31	7,999.4	-12.9	-34.3	451,335.24	535,053.19	32° 14' 26.832 N	104° 13' 11.854 W
8,100.0	1.48	304.28	8,099.4	-11.7	-36.2	451,336.43	535,051.31	32° 14' 26.844 N	104° 13' 11.876 W
8,200.0	0.88	291.89	8,199.4	-10.7	-38.0	451,337.44	535,049.53	32° 14' 26.854 N	104° 13' 11.896 W
8,300.0	0.55	241.92	8,299.4	-10.6	-39.1	451,337.50	535,048.39	32° 14' 26.855 N	104° 13' 11.910 W
8,400.0	0.57	238.19	8,399.4	-11.1	-40.0	451,337.01	535,047.54	32° 14' 26.850 N	104° 13' 11.919 W
8,500.0	0.52	181.93	8,499.4	-11.8	-40.4	451,336.30	535,047.11	32° 14' 26.843 N	104° 13' 11.924 W
8,600.0	0.27	317.41	8,599.4	-12.1	-40.6	451,336.02	535,046.93	32° 14' 26.840 N	104° 13' 11.927 W
8,700.0	0.23	306.56	8,699.4	-11.8	-40.9	451,336.31	535,046.61	32° 14' 26.843 N	104° 13' 11.930 W
8,800.0	0.63	56.19	8,799.4	-11.4	-40.6	451,336.73	535,046.91	32° 14' 26.847 N	104° 13' 11.927 W
8,848.0	0.23	38.29	8,847.4	-11.1	-40.3	451,336.96	535,047.19	32° 14' 26.849 N	104° 13' 11.924 W
8,968.0	0.20	287.10	8,967.4	-10.9	-40.4	451,337.21	535,047.13	32° 14' 26.852 N	104° 13' 11.924 W
9,000.0	0.10	259.30	8,999.4	-10.9	-40.4	451,337.22	535,047.05	32° 14' 26.852 N	104° 13' 11.925 W
9,032.0	0.60	19.40	9,031.4	-10.7	-40.4	451,337.37	535,047.08	32° 14' 26.853 N	104° 13' 11.925 W
9,063.0	3.30	47.70	9,062.3	-10.0	-39.7	451,338.13	535,047.80	32° 14' 26.861 N	104° 13' 11.916 W
9,095.0	5.50	65.10	9,094.2	-8.7	-37.6	451,339.39	535,049.87	32° 14' 26.873 N	104° 13' 11.892 W
9,127.0	8.30	79.50	9,126.0	-7.6	-34.0	451,340.46	535,053.53	32° 14' 26.884 N	104° 13' 11.850 W
9,158.0	10.90	78.30	9,156.6	-6.6	-28.9	451,341.46	535,058.60	32° 14' 26.894 N	104° 13' 11.791 W
9,190.0	14.00	78.30	9,187.8	-5.2	-22.1	451,342.86	535,065.36	32° 14' 26.908 N	104° 13' 11.712 W
9,222.0	17.50	77.60	9,218.6	-3.4	-13.7	451,344.68	535,073.85	32° 14' 26.925 N	104° 13' 11.613 W
9,253.0	20.90	76.90	9,247.9	-1.2	-3.7	451,346.93	535,083.79	32° 14' 26.948 N	104° 13' 11.497 W
9,285.0	24.50	73.50	9,277.4	2.0	8.2	451,350.11	535,095.72	32° 14' 26.979 N	104° 13' 11.358 W
9,317.0	28.10	74.10	9,306.1	6.0	21.8	451,354.06	535,109.33	32° 14' 27.018 N	104° 13' 11.200 W
9,348.0	32.20	73.20	9,332.9	10.4	36.8	451,358.45	535,124.26	32° 14' 27.061 N	104° 13' 11.026 W
9,380.0	35.50	73.50	9,359.5	15.5	53.8	451,363.56	535,141.34	32° 14' 27.112 N	104° 13' 10.827 W
9,412.0	39.70	72.60	9,384.8	21.2	72.5	451,369.25	535,160.01	32° 14' 27.168 N	104° 13' 10.609 W
9,443.0	43.50	73.50	9,408.0	27.1	92.2	451,375.25	535,179.69	32° 14' 27.227 N	104° 13' 10.380 W
9,475.0	47.30	73.50	9,430.4	33.6	114.0	451,381.72	535,201.54	32° 14' 27.291 N	104° 13' 10.126 W
9,507.0	51.90	74.20	9,451.2	40.4	137.4	451,388.49	535,224.94	32° 14' 27.357 N	104° 13' 9.853 W
9,538.0	55.80	75.50	9,469.5	46.9	161.6	451,395.02	535,249.10	32° 14' 27.422 N	104° 13' 9.572 W
9,570.0	59.70	76.50	9,486.5	53.5	187.9	451,401.56	535,275.35	32° 14' 27.486 N	104° 13' 9.266 W
9,602.0	64.20	78.10	9,501.6	59.7	215.4	451,407.76	535,302.90	32° 14' 27.547 N	104° 13' 8.945 W
9,633.0	68.50	79.50	9,514.0	65.2	243.2	451,413.27	535,330.75	32° 14' 27.602 N	104° 13' 8.621 W
9,665.0	72.10	81.40	9,524.8	70.2	272.9	451,418.26	535,360.45	32° 14' 27.651 N	104° 13' 8.275 W
9,697.0	76.30	83.90	9,533.5	74.1	303.5	451,422.19	535,390.98	32° 14' 27.689 N	104° 13' 7.920 W
9,728.0	79.70	86.40	9,540.0	76.7	333.7	451,424.75	535,421.19	32° 14' 27.714 N	104° 13' 7.568 W
9,760.0	82.70	89.30	9,544.9	77.8	365.3	451,425.94	535,452.78	32° 14' 27.726 N	104° 13' 7.200 W
9,792.0	85.00	93.60	9,548.3	77.0	397.1	451,425.13	535,484.58	32° 14' 27.717 N	104° 13' 6.830 W
9,823.0	86.60	96.20	9,550.6	74.4	427.9	451,422.49	535,515.38	32° 14' 27.691 N	104° 13' 6.471 W
9,855.0	86.60	96.00	9,552.5	71.0	459.6	451,419.09	535,547.14	32° 14' 27.657 N	104° 13' 6.101 W
9,887.0	85.90	97.40	9,554.5	67.3	491.3	451,415.37	535,578.85	32° 14' 27.620 N	104° 13' 5.732 W
9,918.0	85.40	100.80	9,556.9	62.4	521.9	451,410.48	535,609.37	32° 14' 27.571 N	104° 13' 5.377 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Black River State
Project:	Eddy County, NM	TVD Reference:	KB @ 3234.2usft
Site:	Black River State	MD Reference:	KB @ 3234.2usft
Well:	#4H	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
9,950.0	87.80	101.80	9,558.8	56.1	553.2	451,404.22	535,640.69	32° 14' 27.509 N	104° 13' 5.012 W
9,982.0	89.30	100.60	9,559.6	49.9	584.6	451,398.01	535,672.07	32° 14' 27.447 N	104° 13' 4.647 W
10,013.0	89.70	101.10	9,559.9	44.1	615.0	451,392.17	535,702.51	32° 14' 27.389 N	104° 13' 4.292 W
10,045.0	89.20	100.20	9,560.2	38.2	646.5	451,386.26	535,733.96	32° 14' 27.330 N	104° 13' 3.926 W
10,077.0	85.60	99.20	9,561.6	32.8	678.0	451,380.87	535,765.47	32° 14' 27.276 N	104° 13' 3.560 W
10,108.0	85.10	98.10	9,564.1	28.1	708.5	451,376.23	535,796.01	32° 14' 27.230 N	104° 13' 3.204 W
10,140.0	84.10	95.30	9,567.2	24.4	740.1	451,372.51	535,827.65	32° 14' 27.193 N	104° 13' 2.836 W
10,172.0	83.70	92.20	9,570.6	22.3	771.9	451,370.43	535,859.39	32° 14' 27.172 N	104° 13' 2.466 W
10,204.0	83.80	89.20	9,574.0	21.9	803.7	451,370.04	535,891.20	32° 14' 27.168 N	104° 13' 2.096 W
10,235.0	85.00	85.70	9,577.1	23.3	834.5	451,371.41	535,922.01	32° 14' 27.181 N	104° 13' 1.737 W
10,267.0	87.30	83.00	9,579.2	26.5	866.3	451,374.56	535,953.78	32° 14' 27.212 N	104° 13' 1.367 W
10,299.0	87.10	82.70	9,580.8	30.4	898.0	451,378.53	535,985.49	32° 14' 27.251 N	104° 13' 0.998 W
10,330.0	87.90	83.50	9,582.1	34.2	928.7	451,382.26	536,016.24	32° 14' 27.287 N	104° 13' 0.640 W
10,375.0	88.60	83.90	9,583.5	39.1	973.4	451,387.19	536,060.95	32° 14' 27.336 N	104° 13' 0.119 W
10,425.0	87.80	82.30	9,585.1	45.1	1,023.1	451,393.19	536,110.56	32° 14' 27.395 N	104° 12' 59.541 W
10,520.0	90.70	84.60	9,586.3	55.9	1,117.4	451,404.03	536,204.91	32° 14' 27.501 N	104° 12' 58.443 W
10,615.0	91.30	87.80	9,584.7	62.2	1,212.2	451,410.32	536,299.68	32° 14' 27.562 N	104° 12' 57.339 W
10,715.0	88.00	89.50	9,585.3	64.6	1,312.1	451,412.68	536,399.63	32° 14' 27.584 N	104° 12' 56.175 W
10,810.0	89.00	91.80	9,587.8	63.5	1,407.1	451,411.60	536,494.59	32° 14' 27.573 N	104° 12' 55.070 W
10,905.0	87.40	91.80	9,590.7	60.5	1,502.0	451,408.62	536,589.49	32° 14' 27.542 N	104° 12' 53.965 W
11,000.0	89.10	92.00	9,593.6	57.4	1,596.9	451,405.47	536,684.39	32° 14' 27.510 N	104° 12' 52.860 W
11,095.0	84.30	90.60	9,599.1	55.2	1,691.7	451,403.32	536,779.18	32° 14' 27.488 N	104° 12' 51.756 W
11,190.0	84.50	90.80	9,608.4	54.1	1,786.2	451,402.16	536,873.72	32° 14' 27.475 N	104° 12' 50.655 W
11,285.0	85.60	90.80	9,616.6	52.7	1,880.8	451,400.84	536,968.35	32° 14' 27.461 N	104° 12' 49.553 W
11,380.0	86.90	90.90	9,622.8	51.3	1,975.6	451,399.43	537,063.13	32° 14' 27.446 N	104° 12' 48.450 W
11,475.0	90.30	92.00	9,625.1	48.9	2,070.6	451,397.03	537,158.06	32° 14' 27.421 N	104° 12' 47.345 W
11,570.0	88.40	91.10	9,626.2	46.4	2,165.5	451,394.46	537,253.01	32° 14' 27.395 N	104° 12' 46.239 W
11,615.0	89.30	91.80	9,627.1	45.2	2,210.5	451,393.32	537,297.99	32° 14' 27.383 N	104° 12' 45.715 W
11,665.0	90.70	92.70	9,627.1	43.3	2,260.4	451,391.36	537,347.95	32° 14' 27.363 N	104° 12' 45.134 W
11,710.0	88.90	91.80	9,627.3	41.5	2,305.4	451,389.59	537,392.91	32° 14' 27.345 N	104° 12' 44.610 W
11,760.0	88.90	91.10	9,628.2	40.2	2,355.4	451,388.33	537,442.89	32° 14' 27.332 N	104° 12' 44.028 W
11,806.0	90.30	91.60	9,628.5	39.1	2,401.4	451,387.24	537,488.87	32° 14' 27.321 N	104° 12' 43.493 W
11,855.0	89.20	91.50	9,628.7	37.8	2,450.4	451,385.92	537,537.85	32° 14' 27.307 N	104° 12' 42.923 W
11,930.0	88.40	89.90	9,630.3	36.9	2,525.3	451,385.00	537,612.83	32° 14' 27.297 N	104° 12' 42.050 W
11,954.0	88.50	89.00	9,631.0	37.1	2,549.3	451,385.23	537,636.82	32° 14' 27.299 N	104° 12' 41.770 W
11,999.0	89.00	88.60	9,631.9	38.1	2,594.3	451,386.17	537,681.80	32° 14' 27.308 N	104° 12' 41.247 W
12,049.0	88.90	87.80	9,632.9	39.6	2,644.3	451,387.74	537,731.76	32° 14' 27.323 N	104° 12' 40.665 W
12,144.0	88.50	87.10	9,635.0	43.9	2,739.1	451,391.97	537,826.64	32° 14' 27.364 N	104° 12' 39.560 W
12,239.0	88.60	86.70	9,637.4	49.0	2,834.0	451,397.11	537,921.47	32° 14' 27.413 N	104° 12' 38.456 W
12,334.0	87.20	84.60	9,640.9	56.2	2,928.6	451,404.31	538,016.13	32° 14' 27.484 N	104° 12' 37.353 W
12,383.0	88.90	86.00	9,642.6	60.2	2,977.4	451,408.32	538,064.93	32° 14' 27.523 N	104° 12' 36.785 W
12,429.0	88.30	85.50	9,643.7	63.6	3,023.3	451,411.73	538,110.79	32° 14' 27.556 N	104° 12' 36.251 W
12,524.0	89.10	86.20	9,645.9	70.5	3,118.0	451,418.60	538,205.52	32° 14' 27.623 N	104° 12' 35.148 W
12,619.0	87.90	85.80	9,648.3	77.1	3,212.8	451,425.22	538,300.25	32° 14' 27.687 N	104° 12' 34.045 W
12,714.0	88.80	85.50	9,651.1	84.3	3,307.4	451,432.43	538,394.94	32° 14' 27.758 N	104° 12' 32.942 W
12,762.0	88.20	86.40	9,652.3	87.7	3,355.3	451,435.81	538,442.80	32° 14' 27.790 N	104° 12' 32.385 W
12,809.0	88.90	86.90	9,653.5	90.5	3,402.2	451,438.56	538,489.71	32° 14' 27.817 N	104° 12' 31.839 W
12,857.0	89.30	86.90	9,654.3	93.1	3,450.1	451,441.16	538,537.63	32° 14' 27.842 N	104° 12' 31.281 W
12,904.0	88.60	86.00	9,655.1	96.0	3,497.0	451,444.06	538,584.53	32° 14' 27.871 N	104° 12' 30.735 W
12,978.0	90.40	88.50	9,655.8	99.5	3,570.9	451,447.61	538,658.43	32° 14' 27.905 N	104° 12' 29.874 W
12,999.0	90.70	88.30	9,655.6	100.1	3,591.9	451,448.20	538,679.42	32° 14' 27.910 N	104° 12' 29.630 W
13,047.0	88.30	86.90	9,656.0	102.1	3,639.9	451,450.21	538,727.38	32° 14' 27.930 N	104° 12' 29.071 W
13,094.0	88.20	90.40	9,657.4	103.2	3,686.8	451,451.32	538,774.33	32° 14' 27.940 N	104° 12' 28.525 W
13,143.0	89.50	92.70	9,658.4	101.9	3,735.8	451,449.99	538,823.30	32° 14' 27.926 N	104° 12' 27.954 W
13,189.0	89.50	93.00	9,658.8	99.6	3,781.7	451,447.70	538,869.24	32° 14' 27.903 N	104° 12' 27.420 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Black River State
Project:	Eddy County, NM	TVD Reference:	KB @ 3234.2usft
Site:	Black River State	MD Reference:	KB @ 3234.2usft
Well:	#4H	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
13,240.0	90.00	93.20	9,659.0	96.8	3,832.7	451,444.95	538,920.17	32° 14' 27.875 N	104° 12' 26.827 W
13,284.0	90.10	92.90	9,659.0	94.5	3,876.6	451,442.61	538,964.10	32° 14' 27.852 N	104° 12' 26.315 W
13,335.0	92.00	93.60	9,658.1	91.6	3,927.5	451,439.71	539,015.01	32° 14' 27.822 N	104° 12' 25.722 W
13,379.0	91.80	92.90	9,656.6	89.1	3,971.4	451,437.22	539,058.92	32° 14' 27.797 N	104° 12' 25.211 W
13,430.0	89.30	92.70	9,656.1	86.6	4,022.3	451,434.73	539,109.85	32° 14' 27.772 N	104° 12' 24.618 W
13,475.0	90.00	92.90	9,656.4	84.4	4,067.3	451,432.53	539,154.79	32° 14' 27.750 N	104° 12' 24.095 W
13,522.0	90.40	93.20	9,656.2	81.9	4,114.2	451,430.03	539,201.73	32° 14' 27.724 N	104° 12' 23.548 W
13,570.0	91.10	93.60	9,655.6	79.1	4,162.1	451,427.19	539,249.64	32° 14' 27.696 N	104° 12' 22.991 W
13,665.0	92.20	93.60	9,652.9	73.1	4,256.9	451,421.22	539,344.41	32° 14' 27.636 N	104° 12' 21.887 W
13,709.0	92.80	93.60	9,650.9	70.4	4,300.8	451,418.46	539,388.28	32° 14' 27.608 N	104° 12' 21.376 W
13,775.0	92.80	93.60	9,647.7	66.2	4,366.6	451,414.32	539,454.07	32° 14' 27.566 N	104° 12' 20.610 W

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------