



NM OIL CONSERVATION

ARTESIA DISTRICT

AUG 3 2015

RECEIVED

April 9, 2015

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

30-015-42894

Attn: Kanicia Castillo

RE: **Chaka State 3H**

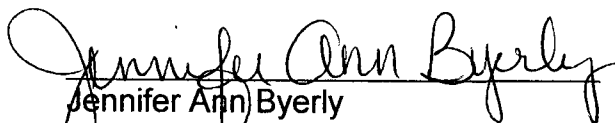
Please find enclosed a copy of the survey from 0' to 10,283' ran on the above referenced well.

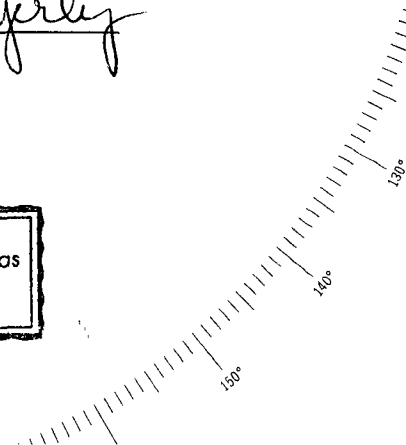
Sincerely, 

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

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


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating

Lease/Well: Chaka State/3H

Rig Name: Latshaw 6

State/County: New Mexico/Eddy

Latitude: 32.27, Longitude: -104.16

GRID North is 0.09 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB 22 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: chaka state 3h.ut

Minimum Curvature Method

Report Date/Time: 4/9/2015 / 14:48

VES Survey International

Fort Worth, Texas

817-741-3610

Surveyor: Eric Warner

Chaka State 3H / API 30-015-42894

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 3 2015

RECEIVED

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	0.38	90.20	100.00	0.00	0.33	0.00	0.33	90.20	0.38
200.00	0.25	71.77	200.00	0.07	0.88	0.07	0.88	85.63	0.16
300.00	0.26	1.25	300.00	0.36	1.09	0.36	1.15	71.58	0.30
400.00	0.12	8.86	400.00	0.70	1.11	0.70	1.32	57.91	0.14
500.00	0.26	5.44	500.00	1.03	1.15	1.03	1.55	48.13	0.14
600.00	0.31	355.01	599.99	1.53	1.15	1.53	1.91	36.98	0.07
700.00	0.61	358.16	699.99	2.32	1.11	2.32	2.58	25.54	0.30
800.00	0.18	354.11	799.99	3.01	1.08	3.01	3.19	19.72	0.43
900.00	0.45	345.81	899.99	3.54	0.97	3.54	3.67	15.25	0.27
1000.00	0.05	331.24	999.99	3.96	0.85	3.96	4.05	12.08	0.40
1100.00	0.38	350.60	1099.99	4.32	0.77	4.32	4.39	10.13	0.33
1200.00	0.44	336.48	1199.98	5.00	0.57	5.00	5.03	6.47	0.12
1300.00	0.36	12.08	1299.98	5.66	0.48	5.66	5.68	4.86	0.25
1400.00	0.99	29.06	1399.97	6.72	0.97	6.72	6.79	8.18	0.65
1500.00	1.58	44.54	1499.95	8.46	2.35	8.46	8.78	15.53	0.68
1600.00	2.27	63.57	1599.89	10.32	5.09	10.32	11.50	26.25	0.93
1700.00	2.56	61.53	1699.80	12.26	8.83	12.26	15.11	35.74	0.31
1800.00	2.45	73.74	1799.71	13.93	12.85	13.93	18.95	42.68	0.54

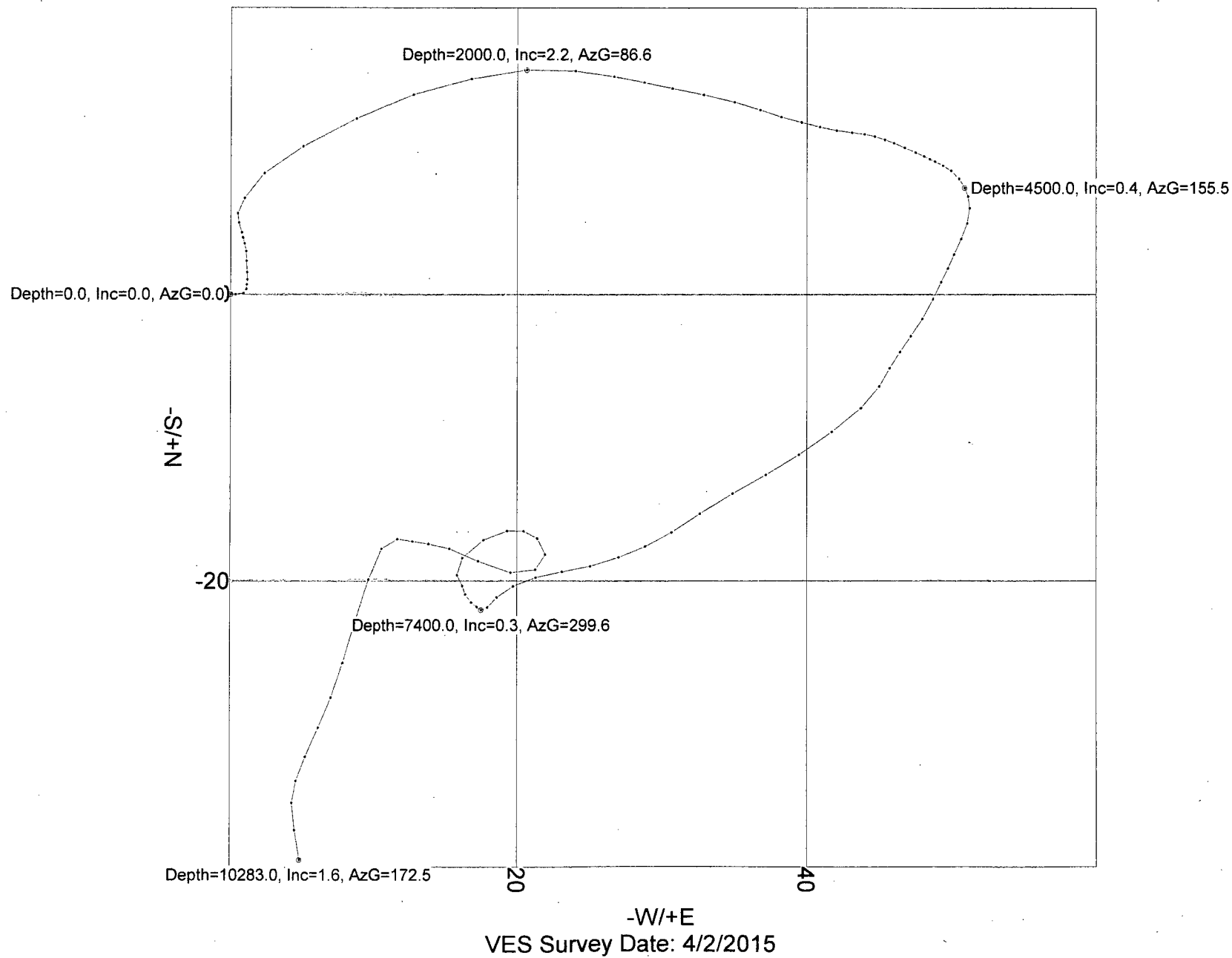
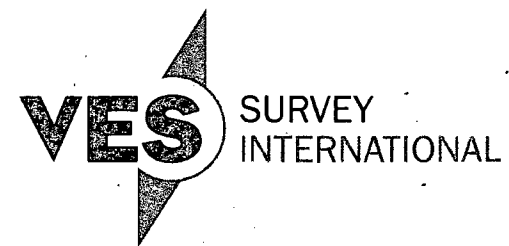
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	2.30	75.34	1899.62	15.04	16.84	15.04	22.58	48.24	0.16
2000.00	2.17	86.61	1999.55	15.66	20.67	15.66	25.93	52.86	0.46
2100.00	1.69	97.34	2099.49	15.58	24.02	15.58	28.63	57.04	0.59
2200.00	1.40	99.24	2199.45	15.19	26.70	15.19	30.72	60.36	0.30
2300.00	1.04	103.69	2299.43	14.78	28.79	14.78	32.36	62.82	0.38
2400.00	1.25	100.72	2399.41	14.36	30.74	14.36	33.93	64.96	0.22
2500.00	1.27	102.31	2499.39	13.92	32.90	13.92	35.73	67.06	0.04
2600.00	1.21	105.06	2599.36	13.41	35.01	13.41	37.49	69.04	0.08
2700.00	0.89	110.21	2699.35	12.87	36.76	12.87	38.95	70.71	0.34
2800.00	0.88	106.58	2799.33	12.38	38.23	12.38	40.19	72.06	0.06
2900.00	0.78	103.74	2899.32	12.00	39.63	12.00	41.41	73.16	0.11
3000.00	0.72	104.05	2999.31	11.68	40.90	11.68	42.54	74.06	0.07
3100.00	0.65	99.78	3099.31	11.43	42.07	11.43	43.60	74.80	0.08
3200.00	0.57	95.73	3199.30	11.29	43.13	11.29	44.58	75.33	0.09
3300.00	0.43	99.49	3299.30	11.17	44.00	11.17	45.39	75.75	0.14
3400.00	0.40	106.53	3399.29	11.01	44.71	11.01	46.04	76.16	0.06
3500.00	0.45	109.04	3499.29	10.78	45.41	10.78	46.68	76.64	0.05
3600.00	0.34	111.40	3599.29	10.55	46.06	10.55	47.25	77.10	0.11
3700.00	0.58	115.18	3699.29	10.23	46.79	10.23	47.90	77.67	0.24
3800.00	0.37	110.73	3799.28	9.90	47.55	9.90	48.57	78.24	0.21
3900.00	0.39	116.98	3899.28	9.63	48.15	9.63	49.10	78.69	0.05
4000.00	0.11	122.12	3999.28	9.43	48.53	9.43	49.43	79.00	0.28
4100.00	0.36	112.24	4099.28	9.26	48.89	9.26	49.76	79.27	0.25
4200.00	0.36	120.24	4199.28	8.99	49.45	8.99	50.26	79.70	0.05
4300.00	0.41	126.06	4299.27	8.62	50.01	8.62	50.74	80.22	0.06
4400.00	0.50	143.57	4399.27	8.06	50.55	8.06	51.19	80.94	0.17
4500.00	0.36	155.52	4499.27	7.42	50.94	7.42	51.48	81.71	0.17
4600.00	0.37	161.21	4599.27	6.84	51.18	6.84	51.63	82.39	0.04
4700.00	0.60	179.70	4699.26	6.01	51.28	6.01	51.63	83.31	0.28
4800.00	0.63	198.97	4799.26	4.97	51.11	4.97	51.35	84.45	0.21
4900.00	0.72	202.25	4899.25	3.87	50.69	3.87	50.84	85.64	0.10
5000.00	0.63	206.26	4999.24	2.79	50.21	2.79	50.28	86.82	0.10
5100.00	0.57	201.30	5099.24	1.83	49.78	1.83	49.81	87.90	0.08
5200.00	0.64	209.16	5199.23	0.87	49.33	0.87	49.33	88.99	0.11
5300.00	0.89	203.10	5299.22	-0.33	48.75	-0.33	48.75	90.39	0.26
5400.00	0.90	213.27	5399.21	-1.70	48.01	-1.70	48.04	92.03	0.16
5500.00	0.77	214.30	5499.20	-2.91	47.21	-2.91	47.30	93.53	0.13
5600.00	0.76	213.75	5599.19	-4.01	46.46	-4.01	46.63	94.93	0.01
5700.00	0.77	211.55	5699.18	-5.14	45.74	-5.14	46.03	96.41	0.03

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	0.90	207.96	5799.17	-6.40	45.02	-6.40	45.47	98.10	0.13
5900.00	1.41	228.20	5899.15	-7.92	43.73	-7.92	44.44	100.26	0.65
6000.00	1.57	232.29	5999.12	-9.58	41.73	-9.58	42.81	102.93	0.19
6100.00	1.62	237.00	6099.08	-11.18	39.46	-11.18	41.02	105.82	0.14
6200.00	1.46	239.88	6199.04	-12.59	37.17	-12.59	39.25	108.71	0.17
6300.00	1.56	240.87	6299.01	-13.90	34.88	-13.90	37.55	111.72	0.10
6400.00	1.47	235.01	6398.97	-15.29	32.65	-15.29	36.05	115.10	0.18
6500.00	1.22	237.52	6498.95	-16.60	30.70	-16.60	34.90	118.40	0.25
6600.00	1.14	245.81	6598.93	-17.58	28.90	-17.58	33.82	121.31	0.19
6700.00	1.17	249.74	6698.90	-18.34	27.03	-18.34	32.67	124.15	0.08
6800.00	1.19	255.17	6798.88	-18.95	25.08	-18.95	31.43	127.08	0.11
6900.00	1.10	262.03	6898.86	-19.35	23.12	-19.35	30.15	129.93	0.16
7000.00	1.02	252.89	6998.85	-19.75	21.32	-19.75	29.06	132.81	0.19
7100.00	0.92	243.11	7098.83	-20.37	19.75	-20.37	28.37	135.89	0.19
7200.00	0.66	225.95	7198.82	-21.14	18.62	-21.14	28.17	138.63	0.35
7300.00	0.42	216.07	7298.82	-21.84	17.98	-21.84	28.29	140.53	0.25
7400.00	0.30	299.63	7398.82	-22.01	17.54	-22.01	28.14	141.45	0.49
7500.00	0.12	321.77	7498.82	-21.80	17.25	-21.80	27.79	141.65	0.19
7600.00	0.43	303.82	7598.82	-21.50	16.87	-21.50	27.33	141.89	0.32
7700.00	0.43	345.93	7698.81	-20.92	16.46	-20.92	26.62	141.81	0.31
7800.00	0.30	330.92	7798.81	-20.33	16.24	-20.33	26.02	141.38	0.16
7900.00	0.66	336.87	7898.81	-19.58	15.89	-19.58	25.22	140.93	0.36
8000.00	1.02	41.09	7998.80	-18.38	16.25	-18.38	24.54	138.52	0.94
8100.00	1.20	55.99	8098.78	-17.13	17.71	-17.13	24.63	134.05	0.34
8200.00	0.86	87.40	8198.76	-16.51	19.32	-16.51	25.41	130.50	0.65
8300.00	0.46	96.80	8298.76	-16.52	20.47	-16.52	26.30	128.90	0.41
8400.00	0.81	130.00	8398.75	-17.02	21.41	-17.02	27.36	128.48	0.50
8500.00	0.76	177.88	8498.74	-18.14	21.98	-18.14	28.50	129.54	0.64
8600.00	0.94	240.83	8598.73	-19.21	21.29	-19.21	28.67	132.05	0.90
8700.00	1.18	280.58	8698.72	-19.42	19.56	-19.42	27.56	134.78	0.76
8800.00	1.57	296.92	8798.69	-18.61	17.33	-18.61	25.43	137.04	0.55
8900.00	0.91	288.52	8898.67	-17.73	15.36	-17.73	23.46	139.11	0.68
9000.00	0.79	275.78	8998.65	-17.41	13.92	-17.41	22.29	141.37	0.22
9100.00	0.51	284.31	9098.65	-17.23	12.80	-17.23	21.47	143.39	0.30
9200.00	0.71	275.80	9198.64	-17.06	11.76	-17.06	20.72	145.43	0.23
9300.00	1.01	211.23	9298.63	-17.76	10.68	-17.76	20.72	148.98	0.96
9400.00	1.68	199.83	9398.60	-19.89	9.72	-19.89	22.14	153.95	0.71
9500.00	1.84	195.74	9498.56	-22.81	8.79	-22.81	24.45	158.93	0.20
9600.00	1.65	197.71	9598.51	-25.72	7.92	-25.72	26.92	162.89	0.20

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
9700.00	1.26	200.08	9698.48	-28.13	7.10	-28.13	29.01	165.83	0.39
9800.00	1.36	205.24	9798.45	-30.24	6.22	-30.24	30.87	168.38	0.15
9900.00	1.20	202.68	9898.43	-32.28	5.31	-32.28	32.71	170.66	0.18
10000.00	0.89	199.73	9998.41	-33.98	4.64	-33.98	34.29	172.22	0.31
10100.00	0.90	181.79	10098.40	-35.49	4.35	-35.49	35.76	173.01	0.28
10200.00	1.33	168.60	10198.38	-37.41	4.56	-37.41	37.69	173.05	0.50
10283.00	1.57	172.52	10281.35	-39.49	4.90	-39.49	39.79	172.93	0.31



VES Survey International
Fort Worth, Texas
817-741-3610
Surveyor: Eric Warner
Chaka State 3H / API 30-015-42894





NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 3 2015

RECEIVED

COG Operating LLC

Eddy County, NM

Chaka State

#3H

OH

Design: OH

Survey Report - Geographic

14 April, 2015





TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Chaka State
Project:	Eddy County, NM	TVD Reference:	KB @ 3169.6usft (Latshaw 6)
Site:	Chaka State	MD Reference:	KB @ 3169.6usft (Latshaw 6)
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:	Chaka State		
Site Position:		Northing:	461,582.30 usft
From:	Map	Easting:	552,914.10 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 8.006 N
		Longitude:	104° 9' 43.698 W
		Grid Convergence:	0.09 °

Well:	#3H		
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° 16' 8.006 N
		Longitude:	104° 9' 43.698 W
		Ground Level:	3,147.6 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	3/9/2015	7.40
			Dip Angle
			(°)
			60.04
			Field Strength
			(nT)
			48,208

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)
	0.0	0.0	0.0
			358.32

Survey Program	Date 4/14/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	9,300.0	GYRO #1 (OH)	Good_gyro
9,351.9	14,226.0	MWD #2 (OH)	Good_gyro
			Description
			Good Gyro
			Good Gyro

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	461,582.30	552,914.10	32° 16' 8.006 N	104° 9' 43.698 W
100.0	0.38	90.20	100.0	0.0	0.3	461,582.30	552,914.43	32° 16' 8.006 N	104° 9' 43.694 W
200.0	0.25	71.77	200.0	0.1	0.9	461,582.37	552,914.97	32° 16' 8.007 N	104° 9' 43.688 W
300.0	0.26	1.25	300.0	0.4	1.1	461,582.66	552,915.18	32° 16' 8.010 N	104° 9' 43.686 W
400.0	0.12	8.86	400.0	0.7	1.1	461,582.99	552,915.21	32° 16' 8.013 N	104° 9' 43.685 W
500.0	0.26	5.44	500.0	1.0	1.1	461,583.32	552,915.24	32° 16' 8.016 N	104° 9' 43.685 W
600.0	0.31	355.01	600.0	1.5	1.1	461,583.82	552,915.24	32° 16' 8.021 N	104° 9' 43.685 W
700.0	0.61	358.16	700.0	2.3	1.1	461,584.62	552,915.20	32° 16' 8.029 N	104° 9' 43.685 W
800.0	0.18	354.11	800.0	3.0	1.1	461,585.31	552,915.17	32° 16' 8.036 N	104° 9' 43.686 W
900.0	0.45	345.81	900.0	3.5	1.0	461,585.84	552,915.06	32° 16' 8.041 N	104° 9' 43.687 W
1,000.0	0.05	331.24	1,000.0	4.0	0.8	461,586.26	552,914.94	32° 16' 8.045 N	104° 9' 43.688 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Chaka State
Project:	Eddy County, NM	TVD Reference:	KB @ 3169.6usft (Latshaw 6)
Site:	Chaka State	MD Reference:	KB @ 3169.6usft (Latshaw 6)
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
1,100.0	0.38	350.60	1,100.0	4.3	0.8	461,586.63	552,914.86	32° 16' 8.049 N	104° 9' 43.689 W
1,200.0	0.44	336.48	1,200.0	5.0	0.6	461,587.31	552,914.66	32° 16' 8.056 N	104° 9' 43.692 W
1,300.0	0.36	12.08	1,300.0	5.7	0.5	461,587.97	552,914.57	32° 16' 8.062 N	104° 9' 43.693 W
1,400.0	0.99	29.06	1,400.0	6.7	1.0	461,589.03	552,915.05	32° 16' 8.073 N	104° 9' 43.687 W
1,500.0	1.58	44.54	1,499.9	8.5	2.3	461,590.77	552,916.44	32° 16' 8.090 N	104° 9' 43.671 W
1,600.0	2.27	63.57	1,599.9	10.3	5.1	461,592.63	552,919.18	32° 16' 8.108 N	104° 9' 43.639 W
1,700.0	2.56	61.53	1,699.8	12.3	8.8	461,594.58	552,922.92	32° 16' 8.127 N	104° 9' 43.595 W
1,800.0	2.45	73.74	1,799.7	13.9	12.8	461,596.24	552,926.93	32° 16' 8.144 N	104° 9' 43.549 W
1,900.0	2.30	75.34	1,899.6	15.0	16.8	461,597.35	552,930.93	32° 16' 8.155 N	104° 9' 43.502 W
2,000.0	2.17	86.61	1,999.5	15.7	20.7	461,597.97	552,934.76	32° 16' 8.161 N	104° 9' 43.457 W
2,100.0	1.69	97.34	2,099.5	15.6	24.0	461,597.89	552,938.11	32° 16' 8.160 N	104° 9' 43.418 W
2,200.0	1.40	99.24	2,199.5	15.2	26.7	461,597.50	552,940.78	32° 16' 8.156 N	104° 9' 43.387 W
2,300.0	1.04	103.69	2,299.4	14.8	28.8	461,597.09	552,942.86	32° 16' 8.152 N	104° 9' 43.363 W
2,400.0	1.25	100.72	2,399.4	14.4	30.7	461,596.68	552,944.82	32° 16' 8.148 N	104° 9' 43.340 W
2,500.0	1.27	102.31	2,499.4	13.9	32.9	461,596.24	552,946.97	32° 16' 8.143 N	104° 9' 43.315 W
2,600.0	1.21	105.06	2,599.4	13.4	35.0	461,595.73	552,949.08	32° 16' 8.138 N	104° 9' 43.291 W
2,700.0	0.89	110.21	2,699.3	12.9	36.7	461,595.18	552,950.82	32° 16' 8.133 N	104° 9' 43.270 W
2,800.0	0.88	106.58	2,799.3	12.4	38.2	461,594.70	552,952.29	32° 16' 8.128 N	104° 9' 43.253 W
2,900.0	0.78	103.74	2,899.3	12.0	39.6	461,594.32	552,953.69	32° 16' 8.124 N	104° 9' 43.237 W
3,000.0	0.72	104.05	2,999.3	11.7	40.9	461,594.00	552,954.96	32° 16' 8.121 N	104° 9' 43.222 W
3,100.0	0.65	99.78	3,099.3	11.5	42.0	461,593.75	552,956.12	32° 16' 8.119 N	104° 9' 43.209 W
3,200.0	0.57	95.73	3,199.3	11.3	43.1	461,593.61	552,957.18	32° 16' 8.117 N	104° 9' 43.196 W
3,300.0	0.43	99.49	3,299.3	11.2	43.9	461,593.49	552,958.04	32° 16' 8.116 N	104° 9' 43.186 W
3,400.0	0.40	106.53	3,399.3	11.0	44.6	461,593.33	552,958.75	32° 16' 8.115 N	104° 9' 43.178 W
3,500.0	0.45	109.04	3,499.3	10.8	45.4	461,593.11	552,959.45	32° 16' 8.112 N	104° 9' 43.170 W
3,600.0	0.34	111.40	3,599.3	10.6	46.0	461,592.87	552,960.10	32° 16' 8.110 N	104° 9' 43.162 W
3,700.0	0.58	115.18	3,699.3	10.2	46.7	461,592.55	552,960.84	32° 16' 8.107 N	104° 9' 43.154 W
3,800.0	0.37	110.73	3,799.3	9.9	47.5	461,592.22	552,961.60	32° 16' 8.103 N	104° 9' 43.145 W
3,900.0	0.39	116.98	3,899.3	9.6	48.1	461,591.95	552,962.20	32° 16' 8.101 N	104° 9' 43.138 W
4,000.0	0.11	122.12	3,999.3	9.4	48.5	461,591.74	552,962.59	32° 16' 8.099 N	104° 9' 43.133 W
4,100.0	0.36	112.24	4,099.3	9.3	48.9	461,591.57	552,962.96	32° 16' 8.097 N	104° 9' 43.129 W
4,200.0	0.36	120.24	4,199.3	9.0	49.4	461,591.30	552,963.52	32° 16' 8.094 N	104° 9' 43.122 W
4,300.0	0.41	126.06	4,299.3	8.6	50.0	461,590.93	552,964.08	32° 16' 8.091 N	104° 9' 43.116 W
4,400.0	0.50	143.57	4,399.3	8.1	50.5	461,590.36	552,964.63	32° 16' 8.085 N	104° 9' 43.110 W
4,500.0	0.36	155.52	4,499.3	7.4	50.9	461,589.73	552,965.02	32° 16' 8.079 N	104° 9' 43.105 W
4,600.0	0.37	161.21	4,599.3	6.8	51.2	461,589.14	552,965.25	32° 16' 8.073 N	104° 9' 43.102 W
4,700.0	0.60	179.70	4,699.3	6.0	51.3	461,588.31	552,965.36	32° 16' 8.065 N	104° 9' 43.101 W
4,800.0	0.63	198.97	4,799.3	5.0	51.1	461,587.26	552,965.18	32° 16' 8.054 N	104° 9' 43.103 W
4,900.0	0.72	202.25	4,899.3	3.9	50.7	461,586.16	552,964.77	32° 16' 8.043 N	104° 9' 43.108 W
5,000.0	0.63	206.26	4,999.2	2.8	50.2	461,585.09	552,964.29	32° 16' 8.033 N	104° 9' 43.114 W
5,100.0	0.57	201.30	5,099.2	1.8	49.8	461,584.13	552,963.86	32° 16' 8.023 N	104° 9' 43.119 W
5,200.0	0.64	209.16	5,199.2	0.9	49.3	461,583.18	552,963.41	32° 16' 8.014 N	104° 9' 43.124 W
5,300.0	0.89	203.10	5,299.2	-0.3	48.7	461,581.98	552,962.83	32° 16' 8.002 N	104° 9' 43.131 W
5,400.0	0.90	213.27	5,399.2	-1.7	48.0	461,580.61	552,962.10	32° 16' 7.989 N	104° 9' 43.139 W
5,500.0	0.77	214.30	5,499.2	-2.9	47.2	461,579.40	552,961.29	32° 16' 7.977 N	104° 9' 43.149 W
5,600.0	0.76	213.75	5,599.2	-4.0	46.4	461,578.29	552,960.54	32° 16' 7.966 N	104° 9' 43.157 W
5,700.0	0.77	211.55	5,699.2	-5.1	45.7	461,577.16	552,959.82	32° 16' 7.955 N	104° 9' 43.166 W
5,800.0	0.90	207.96	5,799.2	-6.4	45.0	461,575.90	552,959.10	32° 16' 7.942 N	104° 9' 43.174 W
5,900.0	1.41	228.20	5,899.2	-7.9	43.7	461,574.38	552,957.81	32° 16' 7.927 N	104° 9' 43.189 W
6,000.0	1.57	232.29	5,999.1	-9.6	41.7	461,572.73	552,955.81	32° 16' 7.911 N	104° 9' 43.213 W
6,100.0	1.62	237.00	6,099.1	-11.2	39.4	461,571.12	552,953.54	32° 16' 7.895 N	104° 9' 43.239 W
6,200.0	1.46	239.88	6,199.0	-12.6	37.2	461,569.71	552,951.26	32° 16' 7.881 N	104° 9' 43.266 W
6,300.0	1.56	240.87	6,299.0	-13.9	34.9	461,568.41	552,948.97	32° 16' 7.868 N	104° 9' 43.292 W
6,400.0	1.47	235.01	6,399.0	-15.3	32.6	461,567.01	552,946.73	32° 16' 7.854 N	104° 9' 43.319 W
6,500.0	1.22	237.52	6,498.9	-16.6	30.7	461,565.70	552,944.78	32° 16' 7.841 N	104° 9' 43.341 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Chaka State
Project:	Eddy County, NM	TVD Reference:	KB @ 3169.6usft (Latshaw 6)
Site:	Chaka State	MD Reference:	KB @ 3169.6usft (Latshaw 6)
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	
6,600.0	1.14	245.81	6,598.9	-17.6	28.9	461,564.72	552,942.97	32° 16' 7.832 N	104° 9' 43.362 W	
6,700.0	1.17	249.74	6,698.9	-18.3	27.0	461,563.96	552,941.11	32° 16' 7.824 N	104° 9' 43.384 W	
6,800.0	1.19	255.17	6,798.9	-19.0	25.0	461,563.34	552,939.15	32° 16' 7.818 N	104° 9' 43.407 W	
6,900.0	1.10	262.03	6,898.9	-19.4	23.1	461,562.94	552,937.19	32° 16' 7.814 N	104° 9' 43.430 W	
7,000.0	1.02	252.89	6,998.8	-19.8	21.3	461,562.55	552,935.39	32° 16' 7.810 N	104° 9' 43.451 W	
7,100.0	0.92	243.11	7,098.8	-20.4	19.7	461,561.92	552,933.82	32° 16' 7.804 N	104° 9' 43.469 W	
7,200.0	0.66	225.95	7,198.8	-21.1	18.6	461,561.16	552,932.69	32° 16' 7.797 N	104° 9' 43.482 W	
7,300.0	0.42	216.07	7,298.8	-21.8	18.0	461,560.46	552,932.06	32° 16' 7.790 N	104° 9' 43.489 W	
7,400.0	0.30	299.63	7,398.8	-22.0	17.5	461,560.30	552,931.62	32° 16' 7.788 N	104° 9' 43.495 W	
7,500.0	0.12	321.77	7,498.8	-21.8	17.2	461,560.51	552,931.33	32° 16' 7.790 N	104° 9' 43.498 W	
7,600.0	0.43	303.82	7,598.8	-21.5	16.8	461,560.80	552,930.95	32° 16' 7.793 N	104° 9' 43.502 W	
7,700.0	0.43	345.93	7,698.8	-20.9	16.4	461,561.37	552,930.55	32° 16' 7.799 N	104° 9' 43.507 W	
7,800.0	0.30	330.92	7,798.8	-20.3	16.2	461,561.97	552,930.33	32° 16' 7.805 N	104° 9' 43.510 W	
7,900.0	0.66	336.87	7,898.8	-19.6	15.9	461,562.72	552,929.98	32° 16' 7.812 N	104° 9' 43.514 W	
8,000.0	1.02	41.09	7,998.8	-18.4	16.2	461,563.92	552,930.33	32° 16' 7.824 N	104° 9' 43.510 W	
8,100.0	1.20	55.99	8,098.8	-17.1	17.7	461,565.18	552,931.79	32° 16' 7.836 N	104° 9' 43.493 W	
8,200.0	0.86	87.40	8,198.8	-16.5	19.3	461,565.80	552,933.41	32° 16' 7.842 N	104° 9' 43.474 W	
8,300.0	0.46	96.80	8,298.8	-16.5	20.5	461,565.79	552,934.55	32° 16' 7.842 N	104° 9' 43.460 W	
8,400.0	0.81	130.00	8,398.8	-17.0	21.4	461,565.28	552,935.49	32° 16' 7.837 N	104° 9' 43.449 W	
8,500.0	0.76	177.88	8,498.7	-18.1	22.0	461,564.17	552,936.06	32° 16' 7.826 N	104° 9' 43.443 W	
8,600.0	0.94	240.83	8,598.7	-19.2	21.3	461,563.11	552,935.37	32° 16' 7.816 N	104° 9' 43.451 W	
8,700.0	1.18	280.58	8,698.7	-19.4	19.5	461,562.89	552,933.64	32° 16' 7.814 N	104° 9' 43.471 W	
8,800.0	1.57	296.92	8,798.7	-18.6	17.3	461,563.70	552,931.41	32° 16' 7.822 N	104° 9' 43.497 W	
8,900.0	0.91	288.52	8,898.7	-17.7	15.3	461,564.58	552,929.43	32° 16' 7.830 N	104° 9' 43.520 W	
9,000.0	0.79	275.78	8,998.7	-17.4	13.9	461,564.90	552,927.99	32° 16' 7.834 N	104° 9' 43.537 W	
9,100.0	0.51	284.31	9,098.6	-17.2	12.8	461,565.08	552,926.88	32° 16' 7.835 N	104° 9' 43.550 W	
9,200.0	0.71	275.80	9,198.6	-17.1	11.7	461,565.25	552,925.83	32° 16' 7.837 N	104° 9' 43.562 W	
9,300.0	1.01	211.23	9,298.6	-17.7	10.7	461,564.56	552,924.75	32° 16' 7.830 N	104° 9' 43.574 W	
TIE-IN to VES Gyro										
9,359.0	1.40	200.10	9,357.6	-18.9	10.1	461,563.44	552,924.24	32° 16' 7.819 N	104° 9' 43.581 W	
9,391.0	1.80	328.70	9,389.6	-18.8	9.7	461,563.50	552,923.84	32° 16' 7.820 N	104° 9' 43.585 W	
9,422.0	7.10	346.70	9,420.5	-16.5	9.0	461,565.78	552,923.15	32° 16' 7.842 N	104° 9' 43.593 W	
9,454.0	11.60	353.20	9,452.1	-11.4	8.2	461,570.90	552,922.31	32° 16' 7.893 N	104° 9' 43.603 W	
9,486.0	16.50	357.70	9,483.1	-3.7	7.6	461,578.64	552,921.75	32° 16' 7.970 N	104° 9' 43.609 W	
9,517.0	19.40	359.30	9,512.6	5.9	7.4	461,588.19	552,921.51	32° 16' 8.064 N	104° 9' 43.612 W	
9,549.0	23.00	0.50	9,542.4	17.5	7.4	461,599.76	552,921.50	32° 16' 8.179 N	104° 9' 43.612 W	
9,581.0	26.60	359.60	9,571.5	30.9	7.4	461,613.18	552,921.50	32° 16' 8.312 N	104° 9' 43.611 W	
9,612.0	29.90	359.30	9,598.8	45.6	7.3	461,627.85	552,921.36	32° 16' 8.457 N	104° 9' 43.613 W	
9,644.0	33.50	358.80	9,626.0	62.4	7.0	461,644.66	552,921.08	32° 16' 8.623 N	104° 9' 43.616 W	
9,676.0	36.50	358.10	9,652.2	80.7	6.5	461,663.01	552,920.58	32° 16' 8.805 N	104° 9' 43.621 W	
9,707.0	39.90	358.60	9,676.6	99.9	5.9	461,682.17	552,920.03	32° 16' 8.994 N	104° 9' 43.627 W	
9,739.0	44.10	358.70	9,700.3	121.3	5.4	461,703.57	552,919.52	32° 16' 9.206 N	104° 9' 43.633 W	
9,771.0	48.10	359.00	9,722.5	144.3	5.0	461,726.62	552,919.06	32° 16' 9.434 N	104° 9' 43.638 W	
9,802.0	52.50	359.20	9,742.3	168.2	4.6	461,750.46	552,918.69	32° 16' 9.670 N	104° 9' 43.642 W	
9,834.0	56.70	358.80	9,760.9	194.2	4.1	461,776.53	552,918.23	32° 16' 9.928 N	104° 9' 43.647 W	
9,866.0	61.20	358.10	9,777.4	221.6	3.4	461,803.93	552,917.49	32° 16' 10.199 N	104° 9' 43.655 W	
9,897.0	64.70	357.20	9,791.5	249.2	2.2	461,831.51	552,916.35	32° 16' 10.472 N	104° 9' 43.667 W	
9,929.0	69.00	357.00	9,804.0	278.6	0.8	461,860.89	552,914.86	32° 16' 10.763 N	104° 9' 43.684 W	
9,961.0	74.00	357.80	9,814.2	308.9	-0.6	461,891.20	552,913.49	32° 16' 11.063 N	104° 9' 43.700 W	
9,993.0	77.60	358.30	9,822.0	339.9	-1.7	461,922.20	552,912.44	32° 16' 11.370 N	104° 9' 43.711 W	
10,025.0	81.60	358.20	9,827.8	371.3	-2.6	461,953.65	552,911.47	32° 16' 11.681 N	104° 9' 43.722 W	
10,056.0	86.00	357.60	9,831.2	402.1	-3.8	461,984.44	552,910.34	32° 16' 11.986 N	104° 9' 43.735 W	
10,088.0	89.60	357.20	9,832.4	434.1	-5.2	462,016.38	552,908.89	32° 16' 12.302 N	104° 9' 43.751 W	
10,120.0	89.20	356.90	9,832.7	466.0	-6.9	462,048.33	552,907.25	32° 16' 12.618 N	104° 9' 43.769 W	
10,215.0	92.40	358.60	9,831.4	560.9	-10.6	462,143.23	552,903.52	32° 16' 13.557 N	104° 9' 43.811 W	



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Chaka State
Project:	Eddy County, NM	TVD Reference:	KB @ 3169.6usft (Latshaw 6)
Site:	Chaka State	MD Reference:	KB @ 3169.6usft (Latshaw 6)
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
10,309.0	89.90	357.60	9,829.5	654.9	-13.7	462,237.16	552,900.40	32° 16' 14.487 N	104° 9' 43.846 W
10,404.0	90.00	356.60	9,829.6	749.7	-18.5	462,332.03	552,895.60	32° 16' 15.426 N	104° 9' 43.900 W
10,498.0	89.50	355.70	9,830.0	843.5	-24.8	462,425.82	552,889.28	32° 16' 16.354 N	104° 9' 43.972 W
10,593.0	89.60	354.70	9,830.7	938.2	-32.8	462,520.48	552,881.33	32° 16' 17.291 N	104° 9' 44.062 W
10,688.0	90.20	356.40	9,830.9	1,032.9	-40.1	462,615.19	552,873.96	32° 16' 18.228 N	104° 9' 44.147 W
10,783.0	89.00	357.70	9,831.6	1,127.8	-45.0	462,710.06	552,869.08	32° 16' 19.167 N	104° 9' 44.202 W
10,879.0	91.60	0.50	9,831.1	1,223.7	-46.5	462,806.03	552,867.57	32° 16' 20.117 N	104° 9' 44.218 W
10,974.0	91.70	358.60	9,828.3	1,318.7	-47.3	462,900.98	552,866.82	32° 16' 21.057 N	104° 9' 44.224 W
11,069.0	90.90	0.30	9,826.2	1,413.6	-48.2	462,995.95	552,865.91	32° 16' 21.997 N	104° 9' 44.233 W
11,164.0	88.90	359.70	9,826.3	1,508.6	-48.2	463,090.94	552,865.91	32° 16' 22.937 N	104° 9' 44.232 W
11,259.0	88.70	358.60	9,828.3	1,603.6	-49.6	463,185.91	552,864.50	32° 16' 23.877 N	104° 9' 44.246 W
11,354.0	88.30	358.50	9,830.8	1,698.5	-52.0	463,280.85	552,862.10	32° 16' 24.816 N	104° 9' 44.272 W
11,450.0	90.10	358.50	9,832.2	1,794.5	-54.5	463,376.80	552,859.59	32° 16' 25.766 N	104° 9' 44.300 W
11,545.0	89.50	358.80	9,832.5	1,889.5	-56.8	463,471.77	552,857.35	32° 16' 26.706 N	104° 9' 44.324 W
11,640.0	90.10	358.30	9,832.8	1,984.4	-59.2	463,566.74	552,854.94	32° 16' 27.646 N	104° 9' 44.350 W
11,735.0	90.40	357.60	9,832.4	2,079.4	-62.6	463,661.68	552,851.55	32° 16' 28.585 N	104° 9' 44.388 W
11,830.0	89.60	358.30	9,832.4	2,174.3	-66.0	463,756.62	552,848.15	32° 16' 29.525 N	104° 9' 44.426 W
11,926.0	89.50	357.90	9,833.2	2,270.3	-69.1	463,852.56	552,844.96	32° 16' 30.474 N	104° 9' 44.461 W
12,021.0	88.90	357.60	9,834.5	2,365.2	-72.9	463,947.48	552,841.24	32° 16' 31.414 N	104° 9' 44.503 W
12,116.0	88.90	358.60	9,836.3	2,460.1	-76.0	464,042.41	552,838.09	32° 16' 32.353 N	104° 9' 44.538 W
12,211.0	90.80	358.70	9,836.6	2,555.1	-78.3	464,137.38	552,835.85	32° 16' 33.293 N	104° 9' 44.562 W
12,306.0	90.20	358.20	9,835.7	2,650.0	-80.8	464,232.34	552,833.28	32° 16' 34.233 N	104° 9' 44.590 W
12,401.0	90.20	358.70	9,835.4	2,745.0	-83.4	464,327.30	552,830.71	32° 16' 35.173 N	104° 9' 44.619 W
12,496.0	92.00	359.90	9,833.6	2,840.0	-84.6	464,422.27	552,829.55	32° 16' 36.112 N	104° 9' 44.630 W
12,591.0	89.30	357.50	9,832.5	2,934.9	-86.7	464,517.22	552,827.39	32° 16' 37.052 N	104° 9' 44.654 W
12,687.0	90.00	356.60	9,833.1	3,030.8	-91.7	464,613.09	552,822.45	32° 16' 38.001 N	104° 9' 44.709 W
12,782.0	91.60	357.60	9,831.8	3,125.7	-96.5	464,707.96	552,817.65	32° 16' 38.940 N	104° 9' 44.764 W
12,877.0	90.20	356.90	9,830.3	3,220.5	-101.0	464,802.83	552,813.09	32° 16' 39.879 N	104° 9' 44.815 W
12,972.0	89.60	357.70	9,830.4	3,315.4	-105.5	464,897.73	552,808.61	32° 16' 40.818 N	104° 9' 44.865 W
13,067.0	86.00	359.10	9,834.1	3,410.3	-108.1	464,992.60	552,805.96	32° 16' 41.757 N	104° 9' 44.895 W
13,162.0	88.90	0.50	9,838.3	3,505.2	-108.5	465,087.50	552,805.63	32° 16' 42.696 N	104° 9' 44.897 W
13,257.0	93.00	0.60	9,836.7	3,600.2	-107.6	465,182.46	552,806.54	32° 16' 43.636 N	104° 9' 44.884 W
13,352.0	92.60	0.20	9,832.1	3,695.0	-106.9	465,277.34	552,807.21	32° 16' 44.575 N	104° 9' 44.875 W
13,447.0	91.60	359.80	9,828.6	3,790.0	-106.9	465,372.28	552,807.21	32° 16' 45.514 N	104° 9' 44.873 W
13,542.0	89.80	358.10	9,827.4	3,884.9	-108.6	465,467.25	552,805.47	32° 16' 46.454 N	104° 9' 44.891 W
13,637.0	91.70	0.00	9,826.2	3,979.9	-110.2	465,562.22	552,803.89	32° 16' 47.394 N	104° 9' 44.908 W
13,732.0	90.50	359.00	9,824.4	4,074.9	-111.0	465,657.19	552,803.06	32° 16' 48.334 N	104° 9' 44.916 W
13,828.0	87.90	359.00	9,825.7	4,170.9	-112.7	465,753.16	552,801.39	32° 16' 49.284 N	104° 9' 44.934 W
13,923.0	87.10	358.80	9,829.9	4,265.8	-114.5	465,848.05	552,799.56	32° 16' 50.223 N	104° 9' 44.953 W
14,018.0	87.60	359.50	9,834.3	4,360.6	-115.9	465,942.94	552,798.16	32° 16' 51.162 N	104° 9' 44.968 W
14,113.0	90.50	1.30	9,835.8	4,455.6	-115.3	466,037.91	552,798.82	32° 16' 52.102 N	104° 9' 44.958 W
14,171.0	89.60	0.60	9,835.8	4,513.6	-114.3	466,095.90	552,799.78	32° 16' 52.676 N	104° 9' 44.946 W
Final MWD Survey									
14,226.0	89.60	0.60	9,836.2	4,568.6	-113.7	466,150.90	552,800.36	32° 16' 53.220 N	104° 9' 44.938 W
Projection to Bit/TD									



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Chaka State
Project:	Eddy County, NM	TVD Reference:	KB @ 3169.6usft (Latshaw 6)
Site:	Chaka State	MD Reference:	KB @ 3169.6usft (Latshaw 6)
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,300.0	9,298.6	-17.7	10.7	TIE-IN to VES Gyro
14,171.0	9,835.8	4,513.6	-114.3	Final MWD Survey
14,226.0	9,836.2	4,568.6	-113.7	Projection to Bit/TD

Checked By: _____	Approved By: _____	Date: _____
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