



July 25, 2014

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

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 13 2014

RECEIVED

Attn: Kanicia Castillo

15-42395

RE: **Asio Otis Federal 3H**

Please find enclosed a copy of the survey from 0.00' to 4950.00' ran on the above referenced well.

Sincerely,

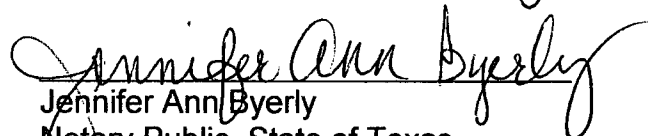

Keith Havelka
Operations

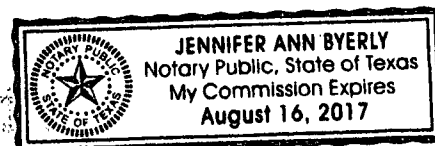
STATE OF TEXAS §

§

COUNTY OF NUECES §

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


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Asio Otis Federal/3H

Rig Name: Patriot 2
State/County: New Mexico/Eddy
Latitude: 32.04, Longitude: -104.23
GRID North is 0.05 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : R.K.B. : 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 7/25/2014 / 11:36

VES Survey International
Midland,Tx
(432)-563-5444
Surveyor: Tim Dillon
Asio Otis Federal 3H / API 30-015-42395

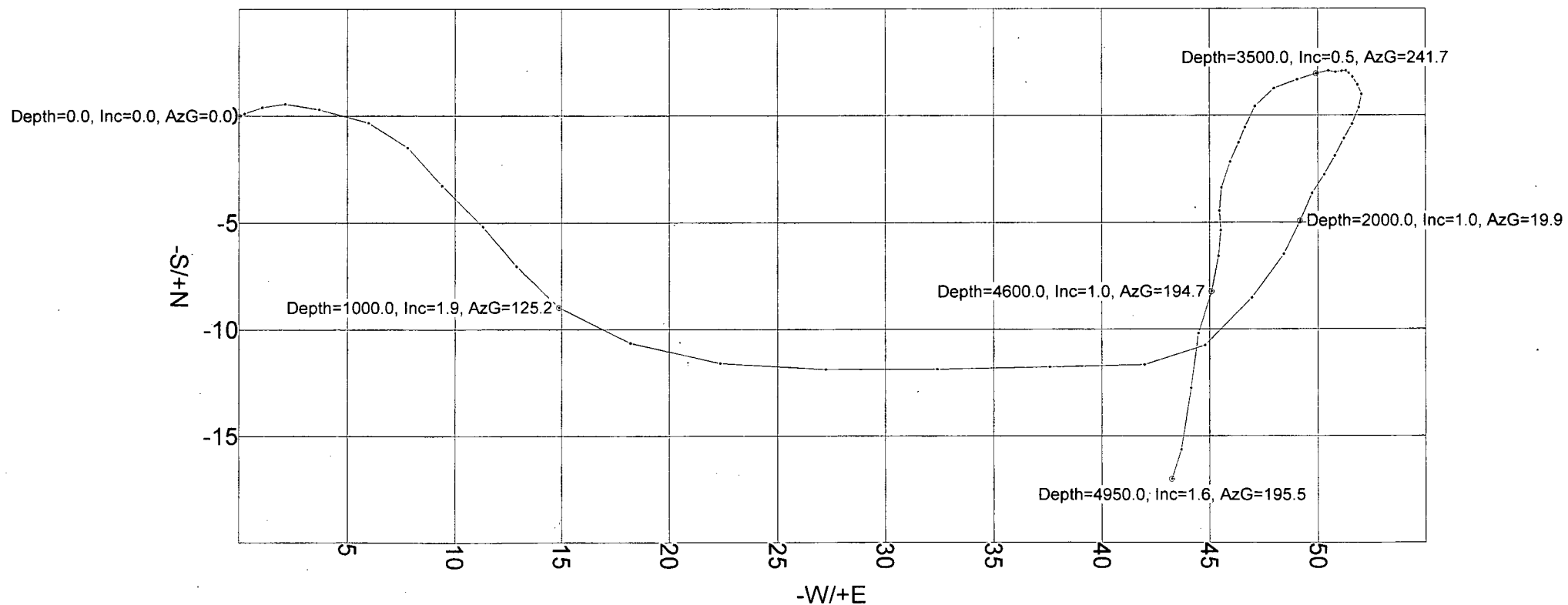
NM OIL CONSERVATION
ARTESIA DISTRICT
NOV 13 2014
RECEIVED

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	0.33	67.12	100.00	0.11	0.26	0.11	0.29	67.12	0.33
200.00	0.67	71.57	200.00	0.41	1.08	0.41	1.15	69.36	0.34
300.00	0.57	92.78	299.99	0.57	2.13	0.57	2.20	75.12	0.25
400.00	1.25	102.57	399.98	0.30	-3.69	0.30	3.71	85.29	0.69
500.00	1.47	107.58	499.95	-0.32	5.98	-0.32	5.99	93.06	0.25
600.00	1.12	142.75	599.92	-1.48	7.79	-1.48	7.93	100.78	0.85
700.00	1.64	135.06	699.90	-3.27	9.39	-3.27	9.94	109.21	0.55
800.00	1.47	134.32	799.86	-5.18	11.31	-5.18	12.44	114.59	0.17
900.00	1.34	146.04	899.83	-7.04	12.88	-7.04	14.68	118.66	0.31
1000.00	1.91	125.25	999.79	-8.97	14.90	-8.97	17.39	121.07	0.81
1100.00	2.37	109.70	1099.72	-10.63	18.21	-10.63	21.09	120.29	0.74
1200.00	2.54	96.74	1199.63	-11.59	22.35	-11.59	25.18	117.41	0.58
1300.00	3.07	90.39	1299.51	-11.87	27.23	-11.87	29.70	113.55	0.62
1400.00	2.85	89.31	1399.38	-11.86	32.39	-11.86	34.49	110.11	0.23
1500.00	3.11	88.60	1499.24	-11.76	37.58	-11.76	39.38	107.38	0.26
1600.00	1.92	88.82	1599.14	-11.66	41.97	-11.66	43.56	105.53	1.18
1700.00	1.64	52.50	1699.10	-10.75	44.78	-10.75	46.06	103.50	1.14
1800.00	1.94	37.49	1799.05	-8.54	46.95	-8.54	47.72	100.31	0.55

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	0.96	31.83	1899.02	-6.49	48.42	-6.49	48.85	97.63	0.99
2000.00	1.04	19.95	1999.00	-4.92	49.17	-4.92	49.42	95.72	0.22
2100.00	0.56	30.01	2098.99	-3.64	49.73	-3.64	49.86	94.19	0.49
2200.00	0.62	35.43	2198.98	-2.77	50.29	-2.77	50.37	93.15	0.08
2300.00	0.55	22.85	2298.98	-1.89	50.79	-1.89	50.83	92.13	0.15
2400.00	0.49	32.08	2398.98	-1.09	51.20	-1.09	51.21	91.22	0.10
2500.00	0.42	27.65	2498.97	-0.40	51.60	-0.40	51.60	90.45	0.08
2600.00	0.55	16.60	2598.97	0.38	51.90	0.38	51.90	89.58	0.16
2700.00	0.17	356.71	2698.97	0.99	52.03	0.99	52.04	88.91	0.40
2800.00	0.39	329.52	2798.97	1.42	51.85	1.42	51.87	88.43	0.25
2900.00	0.12	323.02	2898.96	1.80	51.62	1.80	51.65	88.00	0.27
3000.00	0.17	308.06	2998.96	1.98	51.44	1.98	51.48	87.80	0.06
3100.00	0.04	324.03	3098.96	2.09	51.30	2.09	51.35	87.66	0.13
3200.00	0.21	254.21	3198.96	2.07	51.10	2.07	51.15	87.68	0.20
3300.00	0.12	272.51	3298.96	2.02	50.82	2.02	50.86	87.72	0.11
3400.00	0.27	285.06	3398.96	2.09	50.49	2.09	50.53	87.63	0.15
3500.00	0.46	241.69	3498.96	1.96	49.92	1.96	49.95	87.75	0.32
3600.00	0.61	260.41	3598.96	1.68	49.04	1.68	49.07	88.03	0.23
3700.00	0.73	239.97	3698.95	1.28	47.97	1.28	47.99	88.48	0.26
3800.00	0.71	211.40	3798.94	0.43	47.10	0.43	47.10	89.48	0.36
3900.00	0.54	196.58	3898.94	-0.55	46.64	-0.55	46.64	90.68	0.24
4000.00	0.35	210.41	3998.93	-1.26	46.35	-1.26	46.37	91.56	0.22
4100.00	0.79	200.34	4098.93	-2.17	45.96	-2.17	46.01	92.70	0.45
4200.00	0.68	196.75	4198.92	-3.38	45.55	-3.38	45.68	94.24	0.12
4300.00	0.59	171.69	4298.91	-4.45	45.46	-4.45	45.67	95.59	0.29
4400.00	0.47	181.17	4398.91	-5.37	45.52	-5.37	45.84	96.73	0.15
4500.00	0.92	186.84	4498.90	-6.57	45.42	-6.57	45.89	98.24	0.45
4600.00	1.03	194.72	4598.89	-8.23	45.09	-8.23	45.84	100.35	0.17
4700.00	1.33	199.29	4698.87	-10.20	44.48	-10.20	45.64	102.91	0.32
4800.00	1.68	178.58	4798.83	-12.76	44.14	-12.76	45.94	106.12	0.64
4900.00	1.72	199.09	4898.79	-15.64	43.68	-15.64	46.40	109.70	0.61
4950.00	1.59	195.46	4948.77	-17.02	43.25	-17.02	46.48	111.48	0.33



VES Survey International
Midland, Tx
(432)-563-5444
Surveyor: Tim Dillon
Asio Otis Federal 3H / API 30-015-42395





Standard_report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Asio Otus Federal Well No. 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Site:	Asio Otus Federal	MD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Well:	Asio Otus Federal Well No. 3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Database

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
10,212.00	90.50	1.20	5,594.32	4,839.63	356.32	0.57	4,852.72	381,384.13	531,660.32
10,299.00	90.50	1.20	5,593.56	4,926.61	358.14	0.00	4,939.59	381,471.11	531,662.14
Survey projected to 10299.00 MD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N-S (usft)	+E-W (usft)	Comment	
100.00	100.00	0.11	0.27	Gyro	
4,997.00	4,995.75	-18.38	42.85	MWD surveys	
5,628.00	5,514.24	279.80	126.42	330 Hard line intercept @ 5628 MD	
10,299.00	5,593.56	4,926.61	358.14	Survey projected to 10299.00 MD	



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Asio Otus Federal Well No. 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Site:	Asio Otus Federal	MD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Well:	Asio Otus Federal Well No. 3H	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		
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	Asio Otus Federal		
Site Position:		Northing:	376,544.50 usft
From:	Map	Easting:	531,304.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.03519515
		Longitude:	-104.23231238
		Grid Convergence:	0.05 °

Well	Asio Otus Federal Well No. 3H		
Well Position	+N/-S	0.00 usft	Northing: 376,544.50 usft
	+E/-W	0.00 usft	Easting: 531,304.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.03519515
		Longitude:	-104.23231238
		Ground Level:	3,339.10 usft

Wellbore	Original Hole		
Magnetics:	Model Name	Sample Date	Declination
	IGRF2010	2/18/2014	(°)
			7.55
			Dip Angle (°)
			59.83
			Field Strength (nT)
			48,163

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
			Direction (°)
			4.31

Survey Program	Date	7/26/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	4,950.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
4,997.00	10,299.00	MWD TIP=4950 MD (Original Hole)	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)		
0.00	0.00	0.00	0.00	0.00	0.00	376,544.50	531,304.00	32.03519515	-104.23231238
100.00	0.33	67.12	100.00	0.11	0.27	376,544.61	531,304.27	32.03519545	-104.23231152
Gyro									
200.00	0.67	71.57	200.00	0.41	1.09	376,544.91	531,305.09	32.03519627	-104.23230887
300.00	0.57	92.78	299.99	0.57	2.14	376,545.07	531,306.14	32.03519671	-104.23230548
400.00	1.25	102.57	399.98	0.31	3.70	376,544.81	531,307.70	32.03519598	-104.23230044
500.00	1.47	107.58	499.95	-0.32	5.99	376,544.18	531,309.99	32.03519426	-104.23229306
600.00	1.12	142.75	599.92	-1.48	7.80	376,543.02	531,311.80	32.03519105	-104.23228721
700.00	1.64	135.06	699.89	-3.27	9.40	376,541.23	531,313.40	32.03518613	-104.23228204
800.00	1.47	134.32	799.86	-5.18	11.33	376,539.32	531,315.33	32.03518087	-104.23227583
900.00	1.34	146.04	899.83	-7.05	12.90	376,537.45	531,316.90	32.03517574	-104.23227076



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Asio Otus Federal Well No. 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Site:	Asio Otus Federal	MD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Well:	Asio Otus Federal Well No. 3H	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	1.91	125.25	999.79	-8.98	14.92	376,535.52	531,318.92	32.03517042	-104.23226427
1,100.00	2.37	109.70	1,099.72	-10.64	18.22	376,533.86	531,322.23	32.03516585	-104.23225360
1,200.00	2.54	96.74	1,199.63	-11.60	22.37	376,532.90	531,326.37	32.03516321	-104.23224022
1,300.00	3.07	90.39	1,299.51	-11.87	27.25	376,532.62	531,331.25	32.03516243	-104.23222448
1,400.00	2.85	89.31	1,399.37	-11.86	32.41	376,532.64	531,336.41	32.03516245	-104.23220781
1,500.00	3.11	88.60	1,499.24	-11.77	37.61	376,532.73	531,341.61	32.03516270	-104.23219104
1,600.00	1.92	88.82	1,599.14	-11.67	42.00	376,532.83	531,346.00	32.03516297	-104.23217688
1,700.00	1.64	52.50	1,699.10	-10.76	44.81	376,533.74	531,348.81	32.03516545	-104.23216781
1,800.00	1.94	37.49	1,799.05	-8.55	46.97	376,535.95	531,350.97	32.03517153	-104.23216082
1,900.00	0.96	31.83	1,899.01	-6.49	48.44	376,538.01	531,352.45	32.03517718	-104.23215606
2,000.00	1.04	19.95	1,999.00	-4.93	49.20	376,539.57	531,353.20	32.03518148	-104.23215363
2,100.00	0.56	30.01	2,098.99	-3.65	49.75	376,540.85	531,353.75	32.03518499	-104.23215184
2,200.00	0.62	35.43	2,198.98	-2.79	50.31	376,541.71	531,354.31	32.03518736	-104.23215003
2,300.00	0.55	22.85	2,298.98	-1.90	50.81	376,542.60	531,354.81	32.03518979	-104.23214842
2,400.00	0.49	32.08	2,398.97	-1.10	51.22	376,543.40	531,355.22	32.03519200	-104.23214708
2,500.00	0.42	27.65	2,498.97	-0.41	51.62	376,544.09	531,355.62	32.03519389	-104.23214580
2,600.00	0.55	16.60	2,598.97	0.37	51.93	376,544.87	531,355.93	32.03519604	-104.23214480
2,700.00	0.17	356.71	2,698.97	0.98	52.05	376,545.48	531,356.06	32.03519771	-104.23214439
2,800.00	0.39	329.52	2,798.96	1.42	51.87	376,545.92	531,355.88	32.03519893	-104.23214497
2,900.00	0.12	323.02	2,898.96	1.80	51.64	376,546.30	531,355.64	32.03519996	-104.23214573
3,000.00	0.17	308.06	2,998.96	1.98	51.46	376,546.47	531,355.46	32.03520045	-104.23214631
3,100.00	0.04	324.03	3,098.96	2.10	51.32	376,546.59	531,355.32	32.03520077	-104.23214675
3,200.00	0.21	254.21	3,198.96	2.07	51.12	376,546.57	531,355.13	32.03520072	-104.23214739
3,300.00	0.12	272.51	3,298.96	2.03	50.84	376,546.53	531,354.85	32.03520059	-104.23214829
3,400.00	0.27	285.06	3,398.96	2.09	50.51	376,546.59	531,354.51	32.03520077	-104.23214937
3,500.00	0.46	241.69	3,498.96	1.96	49.93	376,546.46	531,353.93	32.03520042	-104.23215124
3,600.00	0.61	260.41	3,598.96	1.69	49.05	376,546.18	531,353.05	32.03519966	-104.23215408
3,700.00	0.73	239.97	3,698.95	1.28	47.98	376,545.78	531,351.98	32.03519854	-104.23215755
3,800.00	0.71	211.40	3,798.94	0.43	47.10	376,544.93	531,351.10	32.03519621	-104.23216037
3,900.00	0.54	196.58	3,898.94	-0.55	46.64	376,543.95	531,350.65	32.03519352	-104.23216185
4,000.00	0.35	210.41	3,998.93	-1.26	46.35	376,543.23	531,350.36	32.03519155	-104.23216279
4,100.00	0.79	200.34	4,098.93	-2.17	45.96	376,542.32	531,349.96	32.03518905	-104.23216406
4,200.00	0.68	196.75	4,198.92	-3.39	45.55	376,541.11	531,349.55	32.03518571	-104.23216539
4,300.00	0.59	171.69	4,298.91	-4.47	45.45	376,540.03	531,349.46	32.03518275	-104.23216571
4,400.00	0.47	181.17	4,398.91	-5.39	45.52	376,539.11	531,349.52	32.03518022	-104.23216550
4,500.00	0.92	186.84	4,498.90	-6.59	45.42	376,537.90	531,349.42	32.03517690	-104.23216584
4,600.00	1.03	194.72	4,598.89	-8.26	45.09	376,536.24	531,349.09	32.03517232	-104.23216689
4,700.00	1.33	199.29	4,698.87	-10.22	44.48	376,534.27	531,348.48	32.03516692	-104.23216887
4,800.00	1.68	178.58	4,798.83	-12.79	44.13	376,531.71	531,348.13	32.03515989	-104.23216999
4,900.00	1.72	199.09	4,898.79	-15.67	43.68	376,528.83	531,347.68	32.03515196	-104.23217147
4,950.00	1.59	195.46	4,948.77	-17.05	43.25	376,527.45	531,347.25	32.03514817	-104.23217286
4,997.00	1.80	197.30	4,995.75	-18.38	42.85	376,526.12	531,346.86	32.03514451	-104.23217414
MWD surveys									
5,029.00	1.20	15.90	5,027.74	-18.54	42.80	376,525.96	531,346.80	32.03514408	-104.23217432
5,060.00	5.60	15.90	5,058.68	-16.77	43.30	376,527.73	531,347.30	32.03514893	-104.23217269
5,092.00	9.90	12.40	5,090.38	-12.58	44.32	376,531.92	531,348.32	32.03516045	-104.23216939
5,123.00	14.10	9.60	5,120.70	-6.25	45.52	376,538.25	531,349.52	32.03517785	-104.23216549
5,155.00	17.80	10.70	5,151.46	2.40	47.08	376,546.90	531,351.08	32.03520163	-104.23216044
5,186.00	21.30	12.80	5,180.67	12.55	49.21	376,557.05	531,353.21	32.03522952	-104.23215354
5,218.00	24.50	14.50	5,210.14	24.65	52.16	376,569.14	531,356.16	32.03526277	-104.23214398
5,250.00	28.00	12.80	5,238.84	38.40	55.48	376,582.90	531,359.49	32.03530057	-104.23213321
5,282.00	30.80	11.40	5,266.72	53.76	58.77	376,598.26	531,362.77	32.03534278	-104.23212256
5,313.00	33.30	11.70	5,292.99	69.87	62.06	376,614.37	531,366.07	32.03538708	-104.23211188
5,345.00	36.10	12.10	5,319.29	87.70	65.82	376,632.20	531,369.82	32.03543606	-104.23209970
5,377.00	38.20	12.40	5,344.80	106.58	69.92	376,651.08	531,373.93	32.03548796	-104.23208640

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Asio Otus Federal Well No. 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Site:	Asio Otus Federal	MD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Well:	Asio Otus Federal Well No. 3H	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
5,408.00	37.10	15.60	5,369.35	124.95	74.50	376,669.45	531,378.50	32.03553845	-104.23207159
5,440.00	39.60	18.40	5,394.44	143.93	80.31	376,688.43	531,384.31	32.03559061	-104.23205276
5,472.00	43.10	18.70	5,418.46	163.97	87.04	376,708.46	531,391.04	32.03564568	-104.23203100
5,504.00	46.60	18.70	5,441.14	185.34	94.27	376,729.84	531,398.28	32.03570442	-104.23200759
5,535.00	50.30	19.10	5,461.70	207.28	101.79	376,751.78	531,405.79	32.03576472	-104.23198327
5,567.00	54.00	18.70	5,481.33	231.19	109.97	376,775.68	531,413.97	32.03583041	-104.23195679
5,599.00	57.40	18.70	5,499.36	256.22	118.44	376,800.72	531,422.45	32.03589921	-104.23192937
5,628.00	60.86	18.70	5,514.24	279.80	126.42	376,824.29	531,430.43	32.03596400	-104.23190355
330 Hard line intercept @ 5628 MD									
5,630.00	61.10	18.70	5,515.21	281.45	126.98	376,825.95	531,430.99	32.03596855	-104.23190173
5,662.00	65.10	17.30	5,529.69	308.59	135.80	376,853.09	531,439.80	32.03604313	-104.23187322
5,694.00	69.00	16.30	5,542.16	336.79	144.31	376,881.29	531,448.31	32.03612065	-104.23184566
5,725.00	72.70	15.90	5,552.33	364.92	152.43	376,909.42	531,456.43	32.03619796	-104.23181938
5,757.00	78.10	14.90	5,560.39	394.77	160.64	376,939.27	531,464.64	32.03627998	-104.23179277
5,783.00	82.20	14.50	5,564.84	419.54	167.14	376,964.04	531,471.14	32.03634807	-104.23177172
5,815.00	85.00	13.80	5,568.41	450.37	174.91	376,994.87	531,478.92	32.03643281	-104.23174655
5,847.00	87.60	13.10	5,570.47	481.43	182.34	377,025.93	531,486.34	32.03651816	-104.23172249
5,879.00	88.70	13.10	5,571.50	512.58	189.59	377,057.08	531,493.59	32.03660378	-104.23169900
5,942.00	89.20	9.60	5,572.66	574.33	201.98	377,118.83	531,505.99	32.03677350	-104.23165881
6,037.00	89.70	6.80	5,573.57	668.34	215.53	377,212.84	531,519.53	32.03703191	-104.23161481
6,132.00	89.60	6.10	5,574.15	762.74	226.20	377,307.24	531,530.20	32.03729139	-104.23158008
6,227.00	88.30	2.90	5,575.89	857.42	233.65	377,401.91	531,537.66	32.03755164	-104.23155574
6,323.00	88.70	2.20	5,578.40	953.29	237.92	377,497.79	531,541.93	32.03781519	-104.23154167
6,418.00	89.00	1.50	5,580.31	1,048.22	240.99	377,592.72	531,544.99	32.03807615	-104.23153149
6,513.00	91.50	1.90	5,579.90	1,143.17	243.81	377,687.67	531,547.81	32.03833717	-104.23152211
6,608.00	90.30	1.20	5,578.40	1,238.12	246.38	377,782.62	531,550.38	32.03859819	-104.23151353
6,703.00	89.40	2.20	5,578.65	1,333.07	249.20	377,877.57	531,553.20	32.03885922	-104.23150414
6,799.00	89.90	2.20	5,579.24	1,429.00	252.88	377,973.50	531,556.88	32.03912292	-104.23149196
6,894.00	90.30	1.50	5,579.07	1,523.95	255.95	378,068.45	531,559.95	32.03938394	-104.23148177
6,989.00	90.30	1.20	5,578.58	1,618.92	258.19	378,163.42	531,562.19	32.03964502	-104.23147426
7,084.00	92.20	0.50	5,576.50	1,713.88	259.59	378,258.38	531,563.60	32.03990607	-104.23146942
7,179.00	88.50	1.20	5,575.92	1,808.86	261.00	378,353.35	531,565.01	32.04016715	-104.23146459
7,274.00	89.70	1.20	5,577.42	1,903.82	262.99	378,448.32	531,567.00	32.04042821	-104.23145788
7,372.00	90.50	0.80	5,577.25	2,001.81	264.70	378,546.30	531,568.71	32.04069757	-104.23145206
7,467.00	89.30	1.90	5,577.41	2,096.78	266.94	378,641.27	531,570.94	32.04095865	-104.23144455
7,562.00	87.60	2.50	5,579.98	2,191.67	270.59	378,736.17	531,574.59	32.04121950	-104.23143249
7,657.00	88.50	2.20	5,583.21	2,286.53	274.48	378,831.03	531,578.48	32.04148028	-104.23141964
7,752.00	88.50	1.40	5,585.70	2,381.45	277.46	378,925.95	531,581.46	32.04174121	-104.23140973
7,847.00	88.70	1.00	5,588.02	2,476.40	279.45	379,020.90	531,583.45	32.04200223	-104.23140302
7,942.00	88.00	0.50	5,590.76	2,571.35	280.69	379,115.85	531,584.70	32.04226326	-104.23139872
8,037.00	90.70	0.50	5,591.83	2,666.33	281.52	379,210.83	531,585.53	32.04252437	-104.23139575
8,132.00	91.60	1.70	5,589.93	2,761.29	283.35	379,305.79	531,587.35	32.04278542	-104.23138958
8,227.00	91.70	2.10	5,587.19	2,856.20	286.50	379,400.70	531,590.50	32.04304632	-104.23137913
8,309.00	90.90	2.10	5,585.33	2,938.13	289.50	379,482.62	531,593.50	32.04327152	-104.23136918
8,404.00	88.80	2.70	5,585.58	3,033.04	293.48	379,577.54	531,597.48	32.04353243	-104.23135606
8,499.00	88.80	2.20	5,587.57	3,127.93	297.54	379,672.43	531,601.54	32.04379328	-104.23134266
8,594.00	89.80	2.40	5,588.73	3,222.84	301.35	379,767.34	531,605.35	32.04405420	-104.23133007
8,689.00	90.40	1.80	5,588.56	3,317.78	304.83	379,862.28	531,608.83	32.04431517	-104.23131855
8,785.00	90.00	0.60	5,588.23	3,413.76	306.84	379,958.25	531,610.84	32.04457901	-104.23131177
8,880.00	90.10	0.50	5,588.15	3,508.75	307.75	380,053.25	531,611.75	32.04484016	-104.23130853
8,975.00	88.40	2.00	5,589.39	3,603.71	309.82	380,148.21	531,613.83	32.04510122	-104.23130156
9,070.00	89.00	2.00	5,591.55	3,698.63	313.14	380,243.13	531,617.14	32.04536214	-104.23129057
9,165.00	90.40	2.00	5,592.04	3,793.57	316.45	380,338.07	531,620.46	32.04562313	-104.23127958
9,260.00	88.60	2.80	5,592.87	3,888.48	320.43	380,432.98	531,624.43	32.04588403	-104.23126645
9,355.00	89.00	2.80	5,594.86	3,983.34	325.07	380,527.84	531,629.07	32.04614481	-104.23125119

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Asio Otus Federal Well No. 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Site:	Asio Otus Federal	MD Reference:	RKB=3339.1+17 @ 3356.10usft (Patriot 2)
Well:	Asio Otus Federal Well No. 3H	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
9,451.00	88.50	2.50	5,596.96	4,079.22	329.51	380,623.72	531,633.51	32.04640836	-104.23123657
9,547.00	89.30	2.60	5,598.80	4,175.10	333.78	380,719.60	531,637.78	32.04667195	-104.23122250
9,642.00	89.30	2.60	5,599.96	4,270.00	338.09	380,814.50	531,642.09	32.04693281	-104.23120830
9,737.00	90.20	2.00	5,600.37	4,364.92	341.90	380,909.42	531,645.90	32.04719374	-104.23119571
9,832.00	90.00	1.80	5,600.21	4,459.87	345.05	381,004.37	531,649.05	32.04745475	-104.23118525
9,927.00	92.20	2.30	5,598.38	4,554.78	348.45	381,099.28	531,652.45	32.04771567	-104.23117400
10,022.00	90.10	2.00	5,596.48	4,649.69	352.01	381,194.19	531,656.01	32.04797657	-104.23116221
10,117.00	91.00	1.00	5,595.57	4,744.65	354.50	381,289.15	531,658.50	32.04823762	-104.23115389
10,212.00	90.50	1.20	5,594.32	4,839.63	356.32	381,384.13	531,660.32	32.04849871	-104.23114771
10,299.00	90.50	1.20	5,593.56	4,926.61	358.14	381,471.10	531,662.15	32.04873781	-104.23114157
Survey projected to 10299.00 MD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.11	0.27	Gyro
4,997.00	4,995.75	-18.38	42.85	MWD surveys
5,628.00	5,514.24	279.80	126.42	330 Hard line intercept @ 5628 MD
10,299.00	5,593.56	4,926.61	358.14	Survey projected to 10299.00 MD