



June 12, 2014

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

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 29 2014

Attn: Kanicia Castillo

RECEIVED

RE: **Shiner Bock 1 Federal Com No. 008H**

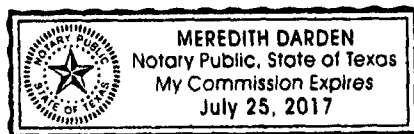
Please find enclosed a copy of the survey from 0.00' to 4,800.00' ran on the above referenced well.

Sincerely,

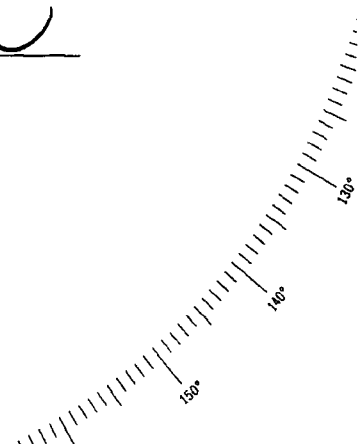

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 12th day of June, A.D., 2014, by Keith Havelka.

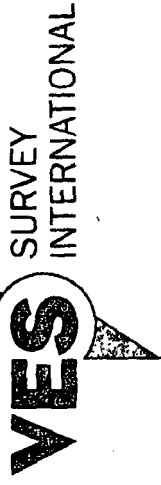



Meredith Darden
Notary Public, State of Texas





Company: COG OPERATING, LLC (CONCHO)
Lease/Well: SHINER BOCK 1 FEDERAL COM/No. 008H



Rig Name: UNITED DRILLING #43
State/County: NEW MEXICO/EDDY
Latitude: 32.86, Longitude: -103.83
GRID North is 0.27 Degrees East of True North
VS-Azi: 0.00 Degrees

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 29 2014
RECEIVED

Depth Reference : 14 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 6/12/2014 / 14:08

VES Survey International
West Texas
(432) 563-5444

Surveyor: Neil Bates

Shiner Bock 1 Federal Com No. 008H / API 30-015-42015

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	0.40	152.96	100.00	-0.31	0.16	-0.31	0.35	152.96	0.40
200.00	0.55	146.89	200.00	-1.03	0.58	-1.03	1.18	150.51	0.15
300.00	0.50	141.88	299.99	-1.77	1.11	-1.77	2.09	147.89	0.07
400.00	0.49	144.62	399.99	-2.46	1.62	-2.46	2.94	146.54	0.02
500.00	0.40	182.66	499.99	-3.15	1.85	-3.15	3.66	149.52	0.30
600.00	0.40	140.61	599.98	-3.77	2.06	-3.77	4.29	151.34	0.28
700.00	0.05	299.93	699.98	-4.01	2.24	-4.01	4.59	150.83	0.44
800.00	0.38	168.00	799.98	-4.31	2.27	-4.31	4.87	152.25	0.42
900.00	0.39	252.84	899.98	-4.74	2.01	-4.74	5.15	156.99	0.52
1000.00	0.45	223.43	999.98	-5.12	1.42	-5.12	5.32	164.55	0.22
1100.00	0.20	261.31	1099.98	-5.44	0.97	-5.44	5.52	169.85	0.32
1200.00	0.15	233.02	1199.98	-5.54	0.70	-5.54	5.59	172.85	0.10
1300.00	0.25	170.06	1299.97	-5.84	0.63	-5.84	5.87	173.87	0.22
1400.00	0.34	110.71	1399.97	-6.15	0.94	-6.15	6.22	171.32	0.30
1500.00	0.36	115.75	1499.97	-6.39	1.50	-6.39	6.57	166.80	0.04
1600.00	0.31	101.07	1599.97	-6.58	2.05	-6.58	6.89	162.71	0.10
1700.00	0.65	110.70	1699.97	-6.84	2.85	-6.84	7.41	157.39	0.35
1800.00	0.41	98.18	1799.96	-7.09	3.74	-7.09	8.02	152.19	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
1900.00	0.63	93.35	1899.96	-7.17	4.65	-7.17	8.55	147.06	0.22
2000.00	0.79	111.65	1999.95	-7.46	5.84	-7.46	9.47	141.95	0.27
2100.00	0.30	121.58	2099.95	-7.85	6.70	-7.85	10.32	139.52	0.50
2200.00	0.77	127.10	2199.94	-8.39	7.45	-8.39	11.22	138.38	0.47
2300.00	0.53	138.32	2299.93	-9.14	8.29	-9.14	12.34	137.77	0.27
2400.00	0.05	154.19	2399.93	-9.52	8.62	-9.52	12.84	137.84	0.49
2500.00	0.09	168.12	2499.93	-9.63	8.65	-9.63	12.95	138.06	0.04
2600.00	0.26	165.50	2599.93	-9.92	8.72	-9.92	13.21	138.67	0.17
2700.00	0.18	217.76	2699.93	-10.27	8.68	-10.27	13.45	139.78	0.21
2800.00	0.19	261.21	2799.93	-10.42	8.42	-10.42	13.40	141.05	0.14
2900.00	0.19	246.95	2899.93	-10.51	8.11	-10.51	13.27	142.35	0.05
3000.00	0.33	256.59	2999.93	-10.64	7.68	-10.64	13.12	144.18	0.14
3100.00	0.31	229.83	3099.93	-10.88	7.20	-10.88	13.04	146.52	0.15
3200.00	0.36	284.30	3199.93	-10.98	6.68	-10.98	12.85	148.67	0.31
3300.00	0.55	273.48	3299.92	-10.87	5.90	-10.87	12.37	151.50	0.20
3400.00	1.06	273.91	3399.91	-10.78	4.50	-10.78	11.68	157.34	0.52
3500.00	0.54	245.86	3499.90	-10.91	3.15	-10.91	11.35	163.91	0.64
3600.00	1.07	289.69	3599.89	-10.78	1.84	-10.78	10.94	170.33	0.78
3700.00	0.72	280.60	3699.88	-10.35	0.34	-10.35	10.36	178.12	0.38
3800.00	0.76	274.77	3799.87	-10.18	-0.94	-10.18	10.22	185.26	0.09
3900.00	1.29	280.16	3899.86	-9.93	-2.71	-9.93	10.29	195.29	0.54
4000.00	1.09	265.83	3999.84	-9.80	-4.78	-9.80	10.90	205.99	0.36
4100.00	1.16	268.64	4099.82	-9.89	-6.74	-9.89	11.97	214.26	0.08
4200.00	0.96	291.50	4199.80	-9.60	-8.53	-9.60	12.84	221.60	0.46
4300.00	1.03	273.62	4299.78	-9.24	-10.21	-9.24	13.77	227.85	0.32
4400.00	0.64	280.87	4399.77	-9.08	-11.66	-9.08	14.78	232.10	0.41
4500.00	0.83	244.06	4499.77	-9.29	-12.86	-9.29	15.86	234.16	0.50
4600.00	0.90	258.43	4599.75	-9.76	-14.27	-9.76	17.29	235.63	0.23
4700.00	0.60	236.95	4699.75	-10.20	-15.48	-10.20	18.54	236.61	0.41
4800.00	0.82	228.30	4799.74	-10.96	-16.45	-10.96	19.77	236.32	0.25



Standard_report



Company: COG Operating LLC Eddy County, New Mexico	Local Coordinates Referenced: TVD Reference: NVD Reference: North Reference: Survey Calculation Method: EDM 15000 ft Database	Well Shiner Bock 1 Federal Com 8H RKB=3989+135 @ 4002.50 usft (United #43) RKB=3989+135 @ 4002.50 usft (United #43) Grid: Minimum Curvature EDM 15000 ft Database
Project: Shiner Bock 1 Federal Com 8H Original Hole: Survey's Original Hole		
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: Shiner Bock 1 Federal Com 8H		
Site Position: Northing: Easting: Slot Radius: Map 0.00 usft	676,006.70 usft 654,169.20 usft 13-3/16 "	Latitude: Longitude: Grid Convergence: 32.85741876 -103.83127952 0.27 "
Position Uncertainty: Map 0.00 usft		
Well: Shiner Bock 1 Federal Com 8H		
Well Position: +N/-S +E/-W 0.00 usft 0.00 usft 0.00 usft	Northing: Easting: Wellhead Elevation: 676,594.50 usft 654,335.80 usft usft	Latitude: Longitude: Ground Level: 32.85903222 -103.83072789 3,989.00 usft
Position Uncertainty: Map 0.00 usft		
Wellbore: Original Hole		
Magnetics: Magnetic Name Sample Date 1/17/2014	Dip Angle (ft) 7.43	Field Strength (mT) 48,706
Design: Survey's Original Hole		
Audit Notes: Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00
Vertical Section: Depth from (TVD) (usft) 0.00	+N/S (usft) 0.00	+E/W (usft) 0.00
		Direction (ft) 97.43



Standard_report

Company:	COG Operating LLC	Local Coordinate Reference:	Well/Shiner Bock Federal Com. 8H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3989-13.5 @ 4002 50usft (United #43)
Site:	Shiner Bock Federal Com.	VD Reference:	RKB=3989-13.5 @ 4002 50usft (United #43)
Well:	Shiner Bock Federal Com. 8H	North Reference:	Grid:
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Survey's Original hole	Database:	EDM 5000.1 Database

Survey Program	From (usft)	To (usft)	Date	Tool Name	Description
	100.00	4,800.00	Gyro (Original hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
	4,861.00	10,048.00	MWD (Original hole)	MWD	MWD - Standard

Survey	UD (usft)	Inc (ft)	Az (azimuth)	TVD (usft)	INS (usft)	E/W (usft)	Disc (ft/100ft)	V. Sec (usft)	North (usft)	East (usft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	676,594.50	654,335.80
	100.00	0.40	152.96	100.00	-0.31	0.15	0.40	0.40	676,594.19	654,335.96
	200.00	0.55	146.89	200.00	-1.02	0.58	0.16	0.71	676,593.48	654,336.38
	300.00	0.50	141.88	299.99	-1.77	1.11	0.07	1.33	676,592.73	654,336.91
	400.00	0.49	144.62	399.99	-2.46	1.63	0.03	1.93	676,592.04	654,337.43
	500.00	0.40	182.66	499.98	-3.16	1.86	0.30	2.25	676,591.34	654,337.66
	600.00	0.40	140.61	599.98	-3.78	2.06	0.29	2.54	676,590.72	654,337.86
	700.00	0.05	299.93	699.98	-4.02	2.25	0.45	2.75	676,590.48	654,338.05
	800.00	0.38	168.00	799.98	-4.33	2.28	0.42	2.82	676,590.17	654,338.08
	900.00	0.39	252.84	899.98	-4.75	2.02	0.52	2.62	676,589.75	654,337.82
	1,000.00	0.45	223.43	999.98	-5.14	1.43	0.22	2.08	676,589.36	654,337.23
	1,100.00	0.20	261.31	1,099.98	-5.45	0.99	0.32	1.68	676,589.05	654,336.79
	1,200.00	0.15	233.02	1,199.98	-5.55	0.71	0.10	1.42	676,588.95	654,336.51
	1,300.00	0.25	170.06	1,299.97	-5.85	0.64	0.23	1.39	676,588.65	654,336.44
	1,400.00	0.34	110.71	1,399.97	-6.17	0.96	0.30	1.75	676,588.33	654,336.76
	1,500.00	0.36	115.75	1,499.97	-6.41	1.52	0.04	2.33	676,588.09	654,337.32
	1,600.00	0.31	101.07	1,599.97	-6.60	2.07	0.10	2.90	676,587.90	654,337.87
	1,700.00	0.65	110.70	1,699.97	-6.85	2.86	0.35	3.72	676,587.65	654,338.66
	1,800.00	0.41	98.18	1,799.96	-7.10	3.75	0.27	4.63	676,587.40	654,339.55
	1,900.00	0.63	93.35	1,899.96	-7.18	4.65	0.22	5.54	676,587.32	654,340.45



Standard_report



Company				COG Operating LLC				Local Co-ordinate Reference				Well/Shiner Bock 1 Federal Com 8H			
Project				Eddy County, New Mexico				TVD Reference				RKB=3989-13.5 @ 4002.50ustf (United #43)			
Site				Shiner Bock 1 Federal Com				MDP Reference				RKB=3989-13.5 @ 4002.50ustf (United #43)			
Well				Shiner Bock 1 Federal Com 8H				North Reference				Grid			
Wellbore				Original hole				Survey Calculation Method				Minimum Curvature			
Design				Surveys Original hole				Database				EDM 5000.1 Database			
Survey	MD (ustf)	Inc (°)	Azi (azimuth)	TVD (ustf)	N/S (ustf)	E/W (ustf)	Dis (ft)	V/Sec (ustf)	Northing (ustf)	Easting (ustf)					
	2,000.00	0.79	111.65	1,999.95	-7.47	5.84	0.28	6.76	676,587.03	654,341.84					
	2,100.00	0.30	121.58	2,099.95	-7.86	6.70	0.50	7.66	676,586.64	654,342.50					
	2,200.00	0.77	127.10	2,199.94	-8.40	7.46	0.47	8.49	676,586.10	654,343.26					
	2,300.00	0.53	136.32	2,299.93	-9.16	8.31	0.27	9.42	676,585.34	654,344.11					
	2,400.00	0.05	154.19	2,399.93	-9.54	8.63	0.48	9.79	676,584.96	654,344.43					
	2,500.00	0.09	168.12	2,499.93	-9.66	8.67	0.04	9.84	676,584.84	654,344.47					
	2,600.00	0.26	165.50	2,599.93	-9.95	8.74	0.17	9.95	676,584.55	654,344.54					
	2,700.00	0.18	217.76	2,699.93	-10.30	8.70	0.21	9.96	676,584.20	654,344.50					
	2,800.00	0.19	261.21	2,799.93	-10.45	8.44	0.14	9.72	676,584.05	654,344.24					
	2,900.00	0.19	246.95	2,899.93	-10.54	8.12	0.05	9.42	676,583.96	654,343.92					
	3,000.00	0.33	256.59	2,999.93	-10.67	7.89	0.15	9.01	676,583.83	654,343.49					
	3,100.00	0.31	229.83	3,099.93	-10.91	7.20	0.15	8.55	676,583.59	654,343.00					
	3,200.00	0.36	284.30	3,199.93	-11.01	6.89	0.31	8.06	676,583.49	654,342.49					
	3,300.00	0.55	273.48	3,299.92	-10.90	5.91	0.21	7.27	676,583.60	654,341.71					
	3,400.00	1.06	273.91	3,399.91	-10.81	4.51	0.51	5.87	676,583.69	654,340.31					
	3,500.00	0.54	245.86	3,499.90	-10.94	3.16	0.64	4.54	676,583.56	654,338.96					
	3,600.00	1.07	289.69	3,599.89	-10.82	1.85	0.78	3.23	676,583.68	654,337.65					
	3,700.00	0.72	280.60	3,699.88	-10.39	0.35	0.38	1.69	676,584.11	654,336.15					
	3,800.00	0.76	274.77	3,799.87	-10.21	-0.93	0.09	0.40	676,584.29	654,334.87					
	3,900.00	1.29	280.16	3,899.86	-9.96	-2.70	0.54	-1.39	676,584.54	654,333.10					
	4,000.00	1.09	265.83	3,999.84	-9.83	-4.75	0.36	-3.44	676,584.67	654,331.05					
	4,100.00	1.16	268.64	4,099.82	-9.92	-6.72	0.09	-5.38	676,584.58	654,329.08					
	4,200.00	0.96	291.50	4,199.80	-9.64	-8.51	0.46	-7.19	676,584.86	654,327.29					
	4,300.00	1.03	273.62	4,299.78	-9.28	-10.18	0.32	-8.90	676,585.22	654,325.62					
	4,400.00	0.64	280.87	4,399.77	-9.12	-11.63	0.40	-10.35	676,585.38	654,324.17					
	4,500.00	0.83	244.06	4,499.77	-9.33	-12.83	0.50	-11.51	676,585.17	654,322.97					
	4,600.00	0.90	258.43	4,599.75	-9.80	-14.25	0.23	-12.86	676,584.70	654,321.55					



Standard_report



Company		COG Operating LLC		Well Shiner Bock 1 Federal Com 8H	
Project		Eddy County, New Mexico		RKB=3989+13.5 @ 4002.50usft (United #43)	
Site		Shiner Bock 1 Federal Com		RKB=3989+13.5 @ 4002.50usft (United #43)	
Well		Shiner Bock 1 Federal Com 8H		Grid	
Wellbore		Original hole		Minimum Curvature	
Design		Surveys:Original hole		EDM 5000.1 Database	
Local Co-ordinate Reference					
TVD Reference		MD Reference		North Reference	
Survey		Survey		Survey	
Calculation Method		Database		Database	
North Reference					
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Standard_report



Company		COG Operating LLC		Eddy County New Mexico		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Original hole		Surveys Original hole		Local Coordinate Reference		Well Shiner, Bock & Federal Com		RKB=9989+13.5 @ 400250usft (United #43)		RKB=9989+13.5 @ 400250usft (United #43)		Grid		Minimum Curvature		EDM150001 Database			
Project		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com	
Site		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com	
Well		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com	
Wellbore Design		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com	
Survey		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com		Shiner, Bock & Federal Com	
MD	(usft)	Inc	(ft)	Azimuth	(ft)	TVD	(usft)	N/S	(usft)	EW	(usft)	BLG	(ft)	V-Log	(usft)	North	(usft)	East	(usft)	North	(usft)	East	(usft)	North	(usft)	East	(usft)	North	(usft)	East	(usft)
5,555.00		61.90		97.50		5,420.12		-71.50		322.30		9.41		328.84		676,523.00		654,658.10		676,523.00		654,658.10		676,523.00		654,658.10		676,523.00		654,658.10	
5,587.00		65.10		97.20		5,434.40		-75.16		350.70		10.04		357.48		676,519.34		654,686.50		676,519.34		654,686.50		676,519.34		654,686.50		676,519.34		654,686.50	
5,618.00		67.60		97.20		5,446.83		-78.72		378.87		8.06		385.87		676,515.78		654,714.87		676,515.78		654,714.87		676,515.78		654,714.87		676,515.78		654,714.87	
5,649.00		70.40		96.80		5,457.94		-82.25		407.60		9.11		414.81		676,512.25		654,743.40		676,512.25		654,743.40		676,512.25		654,743.40		676,512.25		654,743.40	
5,681.00		73.40		96.80		5,467.88		-85.85		437.80		9.37		445.22		676,508.65		654,773.60		676,508.65		654,773.60		676,508.65		654,773.60		676,508.65		654,773.60	
5,712.00		75.50		96.10		5,476.19		-89.20		467.47		7.11		475.08		676,505.30		654,803.27		676,505.30		654,803.27		676,505.30		654,803.27		676,505.30		654,803.27	
5,744.00		77.20		94.70		5,483.74		-92.13		498.43		6.80		506.15		676,502.37		654,834.23		676,502.37		654,834.23		676,502.37		654,834.23		676,502.37		654,834.23	
5,775.00		79.70		93.60		5,489.95		-94.33		528.72		8.78		536.47		676,500.17		654,864.52		676,500.17		654,864.52		676,500.17		654,864.52		676,500.17		654,864.52	
5,807.00		82.50		92.90		5,494.90		-96.12		560.28		9.01		568.00		676,498.38		654,896.08		676,498.38		654,896.08		676,498.38		654,896.08		676,498.38		654,896.08	
5,838.00		85.50		94.30		5,498.14		-98.05		591.04		10.87		598.76		676,496.45		654,926.84		676,496.45		654,926.84		676,496.45		654,926.84		676,496.45		654,926.84	
5,867.00		88.90		97.50		5,499.55		-101.03		619.85		16.09		627.71		676,493.47		654,955.65		676,493.47		654,955.65		676,493.47		654,955.65		676,493.47		654,955.65	
5,961.00		90.80		98.20		5,499.80		-113.87		712.96		2.15		721.70		676,480.63		655,048.76		676,480.63		655,048.76		676,480.63		655,048.76		676,480.63		655,048.76	
6,056.00		91.00		97.20		5,498.31		-126.60		807.09		1.07		816.68		676,467.90		655,142.89		676,467.90		655,142.89		676,467.90		655,142.89		676,467.90		655,142.89	
6,150.00		91.00		96.80		5,496.67		-138.05		900.37		0.43		910.67		676,456.45		655,236.17		676,456.45		655,236.17		676,456.45		655,236.17		676,456.45		655,236.17	
6,245.00		91.30		96.50		5,494.76		-149.05		994.72		0.45		1,005.64		676,445.45		655,330.52		676,445.45		655,330.52		676,445.45		655,330.52		676,445.45		655,330.52	
6,340.00		91.50		96.10		5,492.44		-159.47		1,089.11		0.47		1,100.59		676,435.03		655,424.91		676,435.03		655,424.91		676,435.03		655,424.91		676,435.03		655,424.91	
6,434.00		91.70		96.10		5,489.82		-169.46		1,182.55		0.21		1,194.53		676,425.04		655,518.35		676,425.04		655,518.35		676,425.04		655,518.35		676,425.04		655,518.35	
6,529.00		90.10		95.40		5,488.32		-178.97		1,277.05		1.84		1,289.47		676,415.53		655,612.85		676,415.53		655,612.85		676,415.53		655,612.85		676,415.53		655,612.85	
6,623.00		90.10		95.40		5,488.16		-187.82		1,370.63		0.00		1,383.41		676,406.68		655,706.43		676,406.68		655,706.43		676,406.68		655,706.43		676,406.68		655,706.43	
6,718.00		90.40		95.40		5,487.74		-196.76		1,465.21		0.32		1,478.35		676,397.74		655,801.01		676,397.74		655,801.01		676,397.74		655,801.01		676,397.74		655,801.01	
6,813.00		89.70		95.40		5,487.66		-205.76		1,559.78		0.74		1,573.29		676,388.80		655,895.59		676,388.80		655,895.59		676,388.80		655,895.59		676,388.80		655,895.59	
6,907.00		90.10		95.40		5,487.83		-214.54		1,653.37		0.43		1,667.23		676,379.96		655,989.17		676,379.96		655,989.17		676,379.96		655,989.17		676,379.96		655,989.17	
7,002.00		90.60		95.40		5,487.25		-223.48		1,747.95		0.53		1,762.17		676,371.02		656,083.75		676,371.02		656,083.75		676,371.02		656,083.75		676,371.02		656,083.75	
7,097.00		89.20		95.40		5,487.41		-232.42		1,842.52		1.47		1,857.11		676,362.08		656,178.32		676,362.08		656,178.32		676,362.08		656,178.32		676,362.08		656,178.32	
7,192.00		88.00		94.70		5,489.73		-240.78		1,937.13		1.46		1,952.00		676,353.72		656,272.93		676,353.72		656,272.93		676,353.72		656,272.93		676,353.72		656,272.93	
7,286.00		88.70		95.40		5,492.44		-249.06		2,030.72		1.05		2,045.88		676,345.44		656,366.52		676,345.44		656,366.52		676,345.44		656,366.52		676,345.44		656,366.52	
7,381.00		89.00		96.10		5,494.35		-258.57		2,125.22		0.80		2,140.82		676,335.93		656,461.02		676,335.93		656,461.02		676,335.93		656,461.02		676,335.93		656,461.02	



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Company		COG Operating LLC		Local Co-ordinate Reference		Well Shiner Bock 1 Federal Com 8H			
Project		Eddy County, New Mexico		TVD Reference		RKB=3989+13.5 @ 4002.50ust (United #43)			
Site		Shiner Bock 1 Federal Com		MD Reference		RKB=3989+13.5 @ 4002.50ust (United #43)			
Well		Shiner Bock 1 Federal Com 8H		North Reference		Grid			
Wellbore		Original hole		Survey Calculation Method		Minimum Curvature			
Design		Surveys Original hole		Database		EDM 5000.1 Database			
Survey									
MD (ust)	Inc (°)	Azi (azimuth) (°)	TVD (ust)	N/S (ust)	EW (ust)	D Leg (°/100ft)	V Sec (ust)	Norming (ust)	Easting (ust)
7,475.00	90.40	97.50	5,494.84	-269.70	2,218.56	2.11	2,234.80	676,324.80	656,554.36
7,570.00	90.40	98.60	5,494.17	-283.00	2,312.62	1.16	2,329.79	676,311.50	656,648.42
7,665.00	92.20	97.90	5,492.02	-296.63	2,406.60	2.03	2,424.76	676,297.87	656,742.40
7,760.00	90.40	96.80	5,489.86	-308.78	2,500.79	2.22	2,519.73	676,285.72	656,836.59
7,856.00	91.30	97.50	5,488.44	-320.73	2,596.03	1.19	2,615.71	676,273.77	656,931.83
7,951.00	93.10	98.20	5,484.79	-333.69	2,690.07	2.03	2,710.64	676,260.81	657,025.87
8,046.00	92.90	97.90	5,479.82	-346.98	2,784.01	0.38	2,805.50	676,247.52	657,119.81
8,140.00	93.30	97.20	5,474.74	-359.31	2,877.05	0.86	2,899.36	676,235.19	657,212.85
8,235.00	93.60	96.80	5,469.02	-370.87	2,971.17	0.53	2,994.19	676,223.63	657,306.97
8,330.00	92.90	96.80	5,463.64	-382.10	3,065.35	0.74	3,089.03	676,212.40	657,401.15
8,425.00	92.60	96.50	5,459.08	-393.09	3,159.61	0.45	3,183.91	676,201.41	657,495.41
8,519.00	92.20	97.20	5,455.14	-404.29	3,252.85	0.86	3,277.82	676,190.21	657,588.65
8,614.00	92.00	97.20	5,451.66	-416.19	3,347.04	0.21	3,372.76	676,178.31	657,682.84
8,708.00	92.00	96.80	5,448.38	-427.64	3,440.28	0.43	3,466.70	676,166.86	657,776.08
8,803.00	92.90	96.80	5,444.32	-438.87	3,534.53	0.95	3,561.60	676,155.63	657,870.33
8,898.00	92.20	96.80	5,440.09	-450.11	3,628.76	0.74	3,656.50	676,144.39	657,964.56
8,992.00	90.30	96.50	5,438.04	-460.99	3,722.11	2.05	3,750.47	676,133.51	658,057.91
9,087.00	88.50	96.50	5,439.04	-471.75	3,816.49	1.89	3,845.44	676,122.75	658,152.29
9,182.00	89.40	97.20	5,440.78	-483.07	3,910.79	1.20	3,940.42	676,111.43	658,246.59
9,277.00	89.90	97.90	5,441.36	-495.56	4,004.96	0.91	4,035.42	676,098.94	658,340.76
9,371.00	91.50	98.90	5,440.21	-509.29	4,097.94	2.01	4,129.39	676,085.21	658,433.74
9,465.00	91.50	98.90	5,437.75	-523.82	4,190.78	0.00	4,223.33	676,070.68	658,526.58
9,560.00	91.00	98.90	5,435.68	-538.52	4,284.61	0.53	4,318.28	676,055.98	658,620.41
9,654.00	90.40	98.60	5,434.53	-552.82	4,377.51	0.71	4,412.24	676,041.68	658,713.31
9,749.00	90.40	98.20	5,433.86	-566.69	4,471.49	0.42	4,507.23	676,027.81	658,807.29
9,844.00	90.40	97.90	5,433.20	-580.00	4,565.55	0.32	4,602.22	676,014.50	658,901.35
9,987.00	91.10	98.20	5,431.33	-600.02	4,707.13	0.53	4,745.20	675,994.48	659,042.93



Standard_report

Company: Project: Site: Well: Wellbore: Design:	COC Operating LLC Eddy County New Mexico Shiner Block Federal Com #H Shiner Block Federal Com #H Original hole Survey's Original hole	Local Coordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method: Database:	Well Shiner Block Federal Com #H RKB-3989-1315 @ 4002/50 unit (United #43) RKB-3989-1315 @ 4002/50 unit (United #43) Grid: Minimum Curvature EDM-5000-1 Database						
Survey									
MD (unit)	Inc (ft)	Asl (primach) (ft)	TVD (unit)	NIS (unit)	EW (unit)	Dip (1/100ft)	V-Str (unit)	Northing (unit)	Easting (unit)
10,048.00	91.10	98.20	5,430.16	-608.72	4,767.50	0.00	4,806.18	675,985.78	659,103.30
Survey projected to 10048.00 MD									

Design Annotations					Local Coordinates		
Measured Depth (unit)	Vertical Depth (unit)	+N-S (unit)	+EW (unit)	Comment			
100.00	100.00	-0.31	0.16	Gyro			
4,861.00	4,860.73	-11.49	-17.07	MWD surveys			
5,380.00	5,319.67	-55.70	180.36	330 Hard line intercept @ 5380 MD			
10,048.00	5,430.16	-608.72	4,767.50	Survey projected to 10048.00 MD			