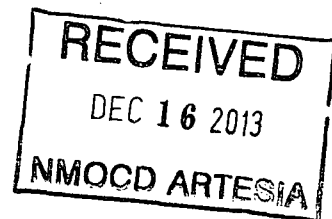


OPERATOR: COG Operating, LLC
WELL/LEASE: Graham Cracker 16 State # 2 H
COUNTY: Eddy Co., New Mexico
Sec. 16, T26S, R28E

30-015-41533

STATE OF NEW MEXICO
DEVIATION REPORT

Depth	Deviation	Depth	Deviation
272	1/2	4,733	1 1/2
443	2	5,087	2 1/4
526	1 1/4	5,380	2
610	3/4	5,663	2
697	1	5,838	2
792	1 1/2	6,023	2 1/4
887	1 1/2	6,126	2 1/4
981	1 1/4	6,293	2 1/2
1,077	3/4	6,388	2 1/2
1,267	1 1/4	6,751	3
1,362	1 1/4	6,922	1 1/2
1,455	1 3/4	6,940	2 1/4
1,550	2 1/2	7,035	2 1/4
1,646	2	7,129	1 1/2
1,741	1 3/4	7,224	1 3/4
1,836	1/4	7,318	2 1/4
1,931	1 1/2	7,430	2
2,122	2	7,461	1 3/4
2,311	2		
2,486	1		
2,642	3/4		
3,009	3/4		
3,347	1/2		
3,633	1/2		
4,234	1		
4,459	1		

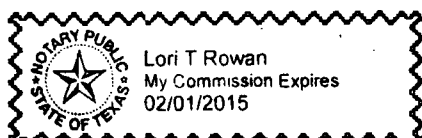


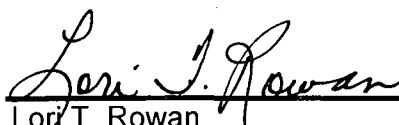
Patriot Drilling, LLC


M/Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 23rd day of
September, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015




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

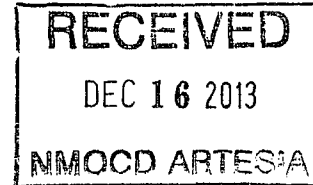


A GYRO TECHNOLOGIES INC. COMPANY

P.O. Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

September 19, 2013

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



Attn: Kanicia Castillo

RE: **Graham Cracker 16 State 2H**

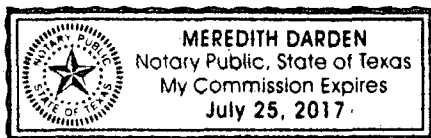
Please find enclosed a copy of the survey from 0.00' to 7345.00' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

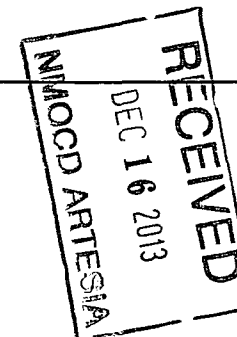
This instrument was acknowledged before me on the 19th day of September A.D., 2013, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas



Company: COG Operating LLC (Concho)
Lease/Well: Graham Cracker 16 State /2H
Location: Sec 16 T26S R28E
Rig Name: Patriot 2
State/County: New Mexico/Eddy
Latitude: 32.05, Longitude: -104.09
GRID North is 0.13 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 16 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...er 16 state #2h gyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 9/19/2013 / 15:22

Vaughn Energy Services
West, Texas
432-563-5444

Surveyor: Chris Bankson
Graham Cracker 16 State 2H / API 30-015-41533

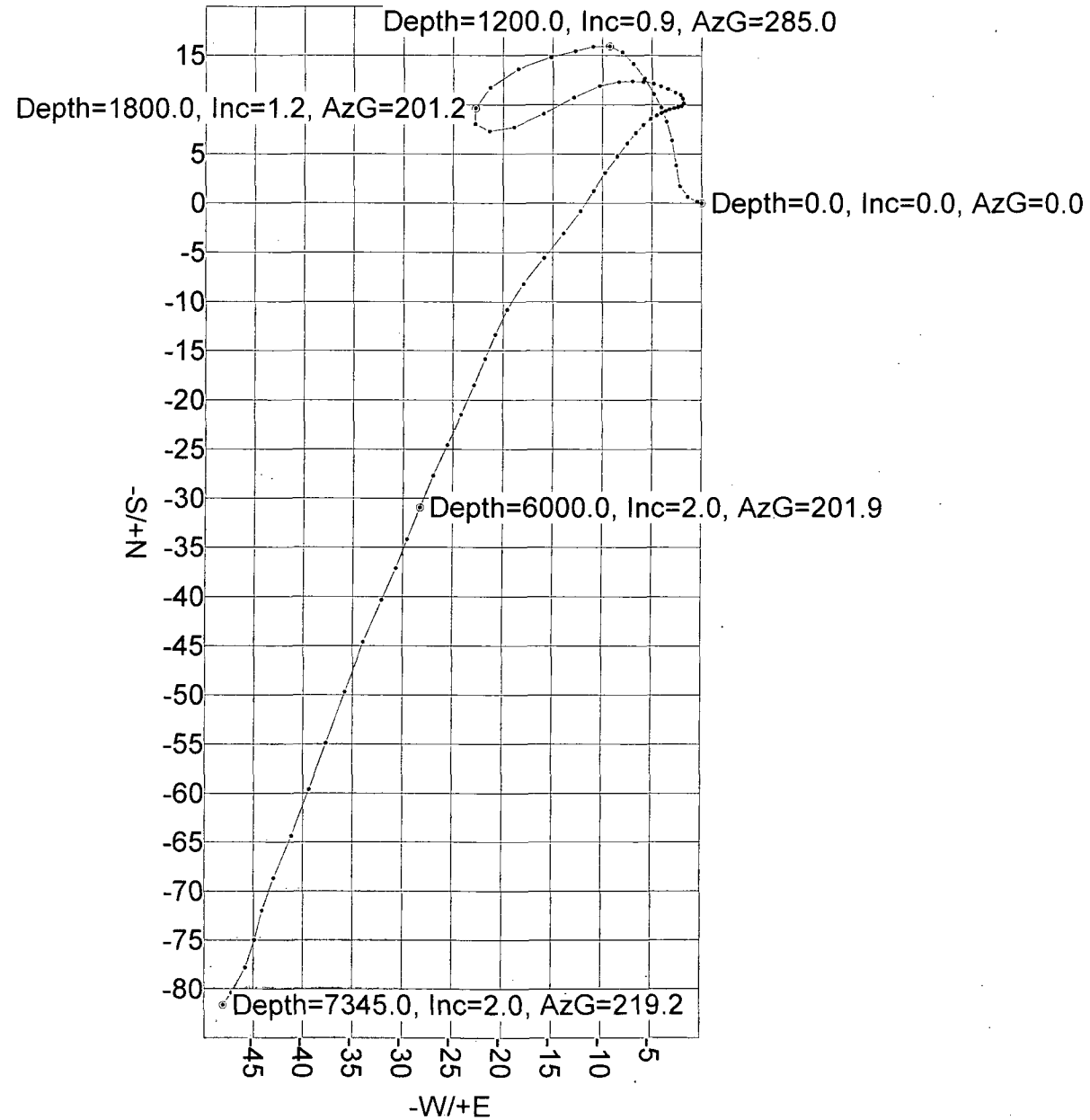
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.55	287.41	100.00	0.14	-0.46	0.14	0.48	287.41	0.55
200.00	0.70	305.12	199.99	0.64	-1.41	0.64	1.55	294.26	0.24
300.00	0.87	341.94	299.98	1.70	-2.14	1.70	2.74	308.47	0.52
400.00	1.63	354.58	399.96	3.84	-2.51	3.84	4.59	326.79	0.81
500.00	1.32	344.39	499.93	6.36	-2.96	6.36	7.02	335.08	0.41
600.00	0.98	343.69	599.91	8.29	-3.51	8.29	9.00	337.08	0.33
700.00	0.77	331.28	699.89	9.70	-4.07	9.70	10.52	337.25	0.29
800.00	1.03	329.91	799.88	11.07	-4.84	11.07	12.08	336.37	0.26
900.00	1.08	328.35	899.87	12.64	-5.78	12.64	13.90	335.42	0.06
1000.00	1.07	321.01	999.85	14.17	-6.87	14.17	15.75	334.15	0.14
1100.00	0.79	307.36	1099.83	15.32	-8.00	15.32	17.28	332.41	0.35
1200.00	0.87	284.97	1199.82	15.93	-9.29	15.93	18.44	329.76	0.33
1300.00	1.09	256.27	1299.81	15.90	-10.94	15.90	19.30	325.46	0.53
1400.00	1.01	254.83	1399.79	15.45	-12.72	15.45	20.01	320.53	0.08
1500.00	1.92	255.94	1499.76	14.81	-15.20	14.81	21.22	314.25	0.91
1600.00	2.12	245.09	1599.70	13.62	-18.50	13.62	22.98	306.36	0.43
1700.00	1.79	225.12	1699.64	11.74	-21.29	11.74	24.31	298.87	0.75
1800.00	1.22	201.20	1799.61	9.64	-22.78	9.64	24.74	292.94	0.84

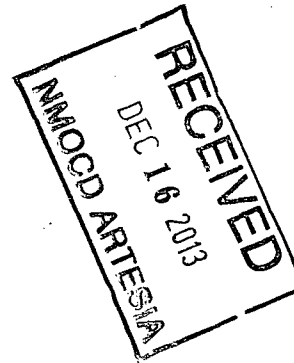
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.84	148.65	1899.59	8.03	-22.79	8.03	24.16	289.41	0.97
2000.00	1.21	95.52	1999.58	7.30	-21.35	7.30	22.57	288.88	0.98
2100.00	1.71	70.14	2099.55	7.71	-18.90	7.71	20.41	292.19	0.81
2200.00	2.02	61.46	2199.49	9.06	-15.94	9.06	18.34	299.61	0.42
2300.00	1.95	61.07	2299.43	10.73	-12.90	10.73	16.78	309.74	0.08
2400.00	1.32	72.20	2399.39	11.90	-10.32	11.90	15.75	319.08	0.70
2500.00	0.96	85.84	2499.37	12.31	-8.38	12.31	14.90	325.75	0.45
2600.00	0.62	89.16	2599.36	12.38	-7.01	12.38	14.23	330.48	0.34
2700.00	0.65	95.88	2699.36	12.33	-5.91	12.33	13.67	334.41	0.08
2800.00	0.58	108.02	2799.35	12.12	-4.86	12.12	13.06	338.14	0.15
2900.00	0.33	109.09	2899.35	11.87	-4.11	11.87	12.56	340.91	0.25
3000.00	0.51	113.39	2999.34	11.59	-3.42	11.59	12.09	343.55	0.19
3100.00	0.44	113.96	3099.34	11.26	-2.66	11.26	11.57	346.70	0.08
3200.00	0.24	122.88	3199.34	10.99	-2.14	10.99	11.20	348.99	0.21
3300.00	0.31	163.36	3299.34	10.63	-1.89	10.63	10.79	349.92	0.20
3400.00	0.25	181.58	3399.34	10.15	-1.82	10.15	10.31	349.84	0.10
3500.00	0.24	250.91	3499.34	9.87	-2.02	9.87	10.07	348.41	0.28
3600.00	0.19	258.37	3599.34	9.76	-2.39	9.76	10.05	346.27	0.05
3700.00	0.28	255.66	3699.34	9.67	-2.78	9.67	10.06	343.94	0.08
3800.00	0.25	252.32	3799.33	9.55	-3.22	9.55	10.08	341.35	0.03
3900.00	0.27	242.34	3899.33	9.37	-3.63	9.37	10.05	338.80	0.05
4000.00	0.27	242.45	3999.33	9.15	-4.05	9.15	10.01	336.13	0.01
4100.00	0.37	240.81	4099.33	8.89	-4.54	8.89	9.98	332.93	0.10
4200.00	0.47	238.59	4199.33	8.52	-5.17	8.52	9.97	328.72	0.10
4300.00	0.55	226.58	4299.32	7.98	-5.87	7.98	9.90	323.64	0.13
4400.00	0.75	219.28	4399.32	7.14	-6.63	7.14	9.75	317.12	0.22
4500.00	0.82	218.26	4499.31	6.07	-7.49	6.07	9.64	309.02	0.07
4600.00	1.11	216.26	4599.29	4.72	-8.51	4.72	9.73	299.04	0.29
4700.00	1.24	215.52	4699.27	3.07	-9.71	3.07	10.18	287.53	0.13
4800.00	1.27	210.77	4799.25	1.24	-10.90	1.24	10.97	276.46	0.11
4900.00	1.53	214.63	4899.22	-0.81	-12.23	-0.81	12.25	266.19	0.27
5000.00	1.70	218.45	4999.18	-3.07	-13.91	-3.07	14.24	257.54	0.20
5100.00	1.91	218.03	5099.13	-5.55	-15.85	-5.55	16.80	250.72	0.21
5200.00	1.91	217.50	5199.07	-8.18	-17.90	-8.18	19.68	245.43	0.02
5300.00	1.69	207.41	5299.02	-10.82	-19.59	-10.82	22.38	241.09	0.39
5400.00	1.50	202.79	5398.99	-13.34	-20.78	-13.34	24.69	237.31	0.24
5500.00	1.57	200.52	5498.95	-15.82	-21.77	-15.82	26.91	233.99	0.09
5600.00	1.75	203.67	5598.91	-18.50	-22.86	-18.50	29.40	231.02	0.20
5700.00	1.98	203.61	5698.86	-21.48	-24.16	-21.48	32.33	228.37	0.23

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	1.91	206.08	5798.80	-24.56	-25.59	-24.56	35.46	226.18	0.11
5900.00	2.02	202.13	5898.74	-27.68	-26.98	-27.68	38.65	224.27	0.17
6000.00	2.00	201.93	5998.68	-30.93	-28.29	-30.93	41.92	222.45	0.02
6100.00	1.99	200.43	6098.62	-34.17	-29.55	-34.17	45.17	220.85	0.05
6200.00	1.62	201.47	6198.57	-37.11	-30.67	-37.11	48.14	219.58	0.37
6300.00	2.43	204.79	6298.50	-40.35	-32.08	-40.35	51.54	218.49	0.81
6400.00	2.90	202.16	6398.40	-44.61	-33.92	-44.61	56.04	217.25	0.49
6500.00	3.30	198.31	6498.25	-49.69	-35.78	-49.69	61.23	215.76	0.45
6600.00	3.06	201.47	6598.10	-54.90	-37.66	-54.90	66.58	214.45	0.29
6700.00	2.71	198.83	6697.97	-59.62	-39.40	-59.62	71.47	213.46	0.37
6800.00	3.05	202.33	6797.84	-64.32	-41.17	-64.32	76.37	212.62	0.38
6900.00	2.33	201.90	6897.73	-68.67	-42.94	-68.67	80.99	212.02	0.72
7000.00	1.73	198.32	6997.67	-71.98	-44.17	-71.98	84.46	211.54	0.61
7100.00	1.85	190.54	7097.62	-75.00	-44.94	-75.00	87.44	210.93	0.27
7200.00	1.55	205.92	7197.58	-77.81	-45.83	-77.81	90.30	210.50	0.54
7300.00	1.80	209.78	7297.53	-80.38	-47.20	-80.38	93.22	210.42	0.27
7345.00	2.01	219.22	7342.51	-81.61	-48.05	-81.61	94.70	210.49	0.84



Vaughn Energy Services
West, Texas
432-563-5444
Surveyor: Chris Bankson
Graham Cracker 16 State 2H / API 30-015-41533





Concho COG Operating LLC

Eddy County, New Mexico

Graham Cracker 16 State

Well 2H

Original Hole

Design: Surveys Original Hole

Standard_report

21 September, 2013

N-ONE



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	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	Graham Cracker 16 State		
Site Position:		Northing:	381,707.70 usft
From:	Map	Easting:	574,192.60 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 57.13165629 N
		Longitude:	104° 5' 37.93417266 W
		Grid Convergence:	0.13 °

Well	Well 2H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/30/2013	7.54	59.88	48,235

Design	Surveys Original Hole			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth:
				0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.67



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey Program		Date	9/21/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	7,345.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s	
7,476.00	12,538.00	MWD TIP=7345 MD (Original Hole)	MWD	MWD - Standard	

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	381,707.70	574,192.60
100.00	0.55	287.41	100.00	0.14	-0.46	0.55	-0.15	381,707.84	574,192.14
Gyro									
200.00	0.70	305.12	199.99	0.64	-1.42	0.24	-0.65	381,708.34	574,191.18
300.00	0.87	341.94	299.98	1.71	-2.15	0.52	-1.72	381,709.41	574,190.45
400.00	1.63	354.58	399.96	3.85	-2.52	0.80	-3.86	381,711.55	574,190.08
500.00	1.32	344.39	499.93	6.37	-2.96	0.40	-6.39	381,714.07	574,189.64
600.00	0.98	343.69	599.91	8.30	-3.51	0.34	-8.32	381,716.00	574,189.09
700.00	0.77	331.28	699.89	9.71	-4.08	0.28	-9.74	381,717.41	574,188.52
800.00	1.03	329.91	799.88	11.08	-4.85	0.26	-11.11	381,718.78	574,187.75
900.00	1.08	328.35	899.87	12.66	-5.80	0.06	-12.69	381,720.36	574,186.80
1,000.00	1.07	321.01	999.85	14.19	-6.88	0.14	-14.23	381,721.89	574,185.72
1,100.00	0.79	307.36	1,099.83	15.33	-8.01	0.36	-15.38	381,723.03	574,184.59
1,200.00	0.87	284.97	1,199.82	15.95	-9.30	0.33	-16.00	381,723.65	574,183.30
1,300.00	1.09	256.27	1,299.81	15.92	-10.95	0.53	-15.98	381,723.62	574,181.65
1,400.00	1.01	254.83	1,399.79	15.46	-12.73	0.08	-15.54	381,723.16	574,179.87
1,500.00	1.92	255.94	1,499.76	14.82	-15.20	0.91	-14.91	381,722.52	574,177.40
1,600.00	2.12	245.09	1,599.70	13.64	-18.51	0.43	-13.74	381,721.34	574,174.09
1,700.00	1.79	225.12	1,699.64	11.76	-21.29	0.75	-11.88	381,719.46	574,171.31
1,800.00	1.22	201.20	1,799.61	9.66	-22.78	0.84	-9.79	381,717.36	574,169.82
1,900.00	0.84	148.65	1,899.59	8.04	-22.79	0.97	-8.18	381,715.74	574,169.81



Standard_report



Company: Concho COG Operating LLC
Project: Eddy County, New Mexico
Site: Graham Cracker 16 State
Well: Well 2H
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well Well 2H
TVD Reference: RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
MD Reference: RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Ddatabase

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,000.00	1.21	95.52	1,999.58	7.32	-21.35	0.97	-7.44	381,715.02	574,171.25
2,100.00	1.71	70.14	2,099.55	7.72	-18.90	0.81	-7.83	381,715.42	574,173.70
2,200.00	2.02	61.46	2,199.49	9.07	-15.95	0.42	-9.16	381,716.77	574,176.65
2,300.00	1.95	61.07	2,299.43	10.74	-12.91	0.07	-10.81	381,718.44	574,179.69
2,400.00	1.32	72.20	2,399.39	11.91	-10.32	0.70	-11.97	381,719.61	574,182.28
2,500.00	0.96	85.84	2,499.37	12.32	-8.39	0.45	-12.37	381,720.02	574,184.21
2,600.00	0.62	89.16	2,599.36	12.39	-7.02	0.34	-12.43	381,720.09	574,185.58
2,700.00	0.65	95.88	2,699.36	12.34	-5.91	0.08	-12.38	381,720.04	574,186.69
2,800.00	0.58	108.02	2,799.35	12.13	-4.86	0.15	-12.16	381,719.83	574,187.74
2,900.00	0.33	109.09	2,899.35	11.88	-4.11	0.25	-11.90	381,719.58	574,188.49
3,000.00	0.51	113.39	2,999.35	11.61	-3.43	0.18	-11.63	381,719.31	574,189.17
3,100.00	0.44	113.96	3,099.34	11.27	-2.67	0.07	-11.29	381,718.97	574,189.93
3,200.00	0.24	122.88	3,199.34	11.00	-2.14	0.21	-11.02	381,718.70	574,190.46
3,300.00	0.31	163.36	3,299.34	10.63	-1.89	0.20	-10.64	381,718.33	574,190.71
3,400.00	0.25	181.58	3,399.34	10.15	-1.82	0.11	-10.16	381,717.85	574,190.78
3,500.00	0.24	250.91	3,499.34	9.87	-2.02	0.28	-9.88	381,717.57	574,190.58
3,600.00	0.19	258.37	3,599.34	9.77	-2.38	0.06	-9.78	381,717.47	574,190.22
3,700.00	0.28	255.66	3,699.34	9.67	-2.78	0.09	-9.69	381,717.37	574,189.82
3,800.00	0.25	252.32	3,799.33	9.54	-3.23	0.03	-9.56	381,717.24	574,189.37
3,900.00	0.27	242.34	3,899.33	9.37	-3.64	0.05	-9.39	381,717.07	574,188.96
4,000.00	0.27	242.45	3,999.33	9.15	-4.06	0.00	-9.17	381,716.85	574,188.54
4,100.00	0.37	240.81	4,099.33	8.88	-4.55	0.10	-8.91	381,716.58	574,188.05
4,200.00	0.47	238.59	4,199.33	8.51	-5.18	0.10	-8.54	381,716.21	574,187.42
4,300.00	0.55	226.58	4,299.32	7.97	-5.88	0.13	-8.00	381,715.67	574,186.72
4,400.00	0.75	219.28	4,399.32	7.13	-6.65	0.22	-7.17	381,714.83	574,185.95
4,500.00	0.82	218.26	4,499.31	6.06	-7.50	0.07	-6.11	381,713.76	574,185.10
4,600.00	1.11	216.26	4,599.29	4.72	-8.52	0.29	-4.77	381,712.42	574,184.08



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
4,700.00	1.24	215.52	4,699.27	3.06	-9.72	0.13	-3.12	381,710.76	574,182.88	
4,800.00	1.27	210.77	4,799.25	1.23	-10.92	0.11	-1.29	381,708.93	574,181.68	
4,900.00	1.53	214.63	4,899.22	-0.82	-12.24	0.28	0.75	381,706.88	574,180.36	
5,000.00	1.70	218.45	4,999.18	-3.08	-13.92	0.20	3.00	381,704.62	574,178.68	
5,100.00	1.91	218.03	5,099.13	-5.56	-15.87	0.21	5.47	381,702.14	574,176.73	
5,200.00	1.91	217.50	5,199.07	-8.19	-17.91	0.02	8.09	381,699.51	574,174.69	
5,300.00	1.89	207.41	5,299.02	-10.82	-19.61	0.38	10.71	381,696.88	574,172.99	
5,400.00	1.50	202.79	5,398.99	-13.34	-20.79	0.23	13.22	381,694.36	574,171.81	
5,500.00	1.57	200.52	5,498.95	-15.83	-21.78	0.09	15.70	381,691.87	574,170.82	
5,600.00	1.75	203.67	5,598.91	-18.51	-22.87	0.20	18.38	381,689.19	574,169.73	
5,700.00	1.98	203.61	5,698.86	-21.49	-24.18	0.23	21.35	381,686.21	574,168.42	
5,800.00	1.91	206.08	5,798.80	-24.57	-25.60	0.11	24.42	381,683.13	574,167.00	
5,900.00	2.02	202.13	5,898.74	-27.70	-27.00	0.17	27.55	381,680.00	574,165.60	
6,000.00	2.00	201.93	5,998.68	-30.95	-28.31	0.02	30.79	381,676.75	574,164.29	
6,100.00	1.99	200.43	6,098.62	-34.20	-29.57	0.05	34.03	381,673.50	574,163.03	
6,200.00	1.62	201.47	6,198.57	-37.14	-30.70	0.37	36.96	381,670.56	574,161.90	
6,300.00	2.43	204.79	6,298.50	-40.38	-32.10	0.82	40.20	381,667.32	574,160.50	
6,400.00	2.90	202.16	6,398.40	-44.65	-33.94	0.49	44.45	381,663.05	574,158.66	
6,500.00	3.30	198.31	6,498.25	-49.72	-35.80	0.45	49.52	381,657.98	574,156.80	
6,600.00	3.06	201.47	6,598.09	-54.94	-37.68	0.30	54.72	381,652.76	574,154.92	
6,700.00	2.71	198.83	6,697.97	-59.66	-39.42	0.37	59.43	381,648.04	574,153.18	
6,800.00	3.05	202.33	6,797.84	-64.36	-41.20	0.38	64.12	381,643.34	574,151.40	
6,900.00	2.33	201.90	6,897.73	-68.71	-42.97	0.72	68.46	381,638.99	574,149.63	
7,000.00	1.73	198.32	6,997.67	-72.03	-44.20	0.61	71.77	381,635.67	574,148.40	
7,100.00	1.85	190.54	7,097.62	-75.05	-44.97	0.27	74.79	381,632.65	574,147.63	
7,200.00	1.55	205.92	7,197.58	-77.85	-45.86	0.54	77.58	381,629.85	574,146.74	
7,300.00	1.80	209.78	7,297.53	-80.43	-47.23	0.27	80.16	381,627.27	574,145.37	



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
7,345.00	2.01	219.22	7,342.51	-81.65	-48.08	0.84	81.38	381,626.05	574,144.52	
7,476.00	1.50	255.30	7,473.45	-83.87	-51.19	0.91	83.57	381,623.83	574,141.41	
MWD surveys										
7,507.00	1.70	241.60	7,504.44	-84.19	-51.99	1.39	83.89	381,623.51	574,140.61	
7,539.00	3.10	210.70	7,536.41	-85.16	-52.84	5.81	84.85	381,622.54	574,139.76	
7,570.00	5.50	200.50	7,567.32	-87.27	-53.79	8.10	86.96	381,620.43	574,138.81	
7,602.00	7.70	198.50	7,599.11	-90.74	-55.01	6.91	90.42	381,616.96	574,137.59	
7,634.00	10.50	195.70	7,630.70	-95.58	-56.48	8.86	95.26	381,612.12	574,136.12	
7,666.00	13.60	192.30	7,661.99	-102.07	-58.07	9.93	101.73	381,605.63	574,134.53	
7,697.00	16.90	191.20	7,691.90	-110.05	-59.72	10.69	109.71	381,597.65	574,132.88	
7,729.00	20.00	189.80	7,722.25	-120.01	-61.56	9.79	119.65	381,587.69	574,131.04	
7,761.00	22.50	187.70	7,752.07	-131.47	-63.31	8.17	131.10	381,576.23	574,129.29	
7,793.00	25.30	186.40	7,781.32	-144.34	-64.89	8.90	143.96	381,563.36	574,127.71	
7,824.00	28.30	185.90	7,808.99	-158.23	-66.39	9.70	157.85	381,549.47	574,126.21	
7,856.00	30.90	186.90	7,836.81	-173.94	-68.15	8.27	173.54	381,533.76	574,124.45	
7,887.00	34.80	186.10	7,862.85	-190.64	-70.05	12.66	190.24	381,517.06	574,122.55	
7,919.00	39.00	185.40	7,888.44	-209.75	-71.97	13.19	209.34	381,497.95	574,120.63	
7,951.00	42.50	182.30	7,912.68	-230.59	-73.35	12.63	230.16	381,477.11	574,119.25	
7,982.00	46.40	178.90	7,934.80	-252.29	-73.56	14.74	251.86	381,455.41	574,119.04	
8,014.00	50.30	178.30	7,956.07	-276.19	-72.97	12.27	275.76	381,431.51	574,119.63	
8,046.00	54.50	177.70	7,975.59	-301.52	-72.08	13.21	301.10	381,406.18	574,120.52	
8,078.00	59.00	177.10	7,993.13	-328.24	-70.86	14.15	327.83	381,379.46	574,121.74	
8,109.00	63.50	176.70	8,008.04	-355.37	-69.39	14.56	354.97	381,352.33	574,123.21	
8,141.00	67.40	177.00	8,021.33	-384.43	-67.79	12.22	384.04	381,323.27	574,124.81	
8,173.00	71.70	177.60	8,032.51	-414.38	-66.38	13.55	413.99	381,293.32	574,126.22	
8,204.00	76.40	178.30	8,041.02	-444.15	-65.32	15.32	443.77	381,263.55	574,127.28	
8,236.00	81.50	178.30	8,047.15	-475.54	-64.39	15.94	475.16	381,232.16	574,128.21	



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
8,268.00	87.00	178.60	8,050.36	-507.35	-63.53	17.21	506.98	381,200.35	574,129.07
8,300.00	91.30	179.20	8,050.83	-539.33	-62.91	13.57	538.96	381,168.37	574,129.69
8,363.00	92.30	179.60	8,048.85	-602.30	-62.26	1.71	601.93	381,105.40	574,130.34
8,458.00	91.70	179.60	8,045.54	-697.24	-61.59	0.63	696.87	381,010.46	574,131.01
8,553.00	91.30	178.80	8,043.05	-792.20	-60.27	0.94	791.84	380,915.50	574,132.33
8,649.00	90.90	178.50	8,041.21	-888.15	-58.01	0.52	887.80	380,819.55	574,134.59
8,744.00	89.90	178.40	8,040.55	-983.11	-55.44	1.06	982.78	380,724.59	574,137.16
8,839.00	90.30	177.80	8,040.38	-1,078.06	-52.29	0.76	1,077.74	380,629.64	574,140.31
8,934.00	91.50	177.60	8,038.89	-1,172.97	-48.47	1.28	1,172.67	380,534.73	574,144.13
9,029.00	90.00	177.00	8,037.64	-1,267.85	-44.00	1.70	1,267.58	380,439.85	574,148.60
9,124.00	91.00	176.70	8,036.82	-1,362.70	-38.78	1.10	1,362.46	380,345.00	574,153.82
9,219.00	90.10	175.80	8,035.90	-1,457.50	-32.57	1.34	1,457.28	380,250.20	574,160.03
9,314.00	88.70	178.00	8,036.90	-1,552.34	-27.43	2.74	1,552.16	380,155.36	574,165.17
9,409.00	89.40	177.40	8,038.47	-1,647.25	-23.62	0.97	1,647.09	380,060.45	574,168.98
9,504.00	90.40	177.40	8,038.64	-1,742.15	-19.31	1.05	1,742.01	379,965.55	574,173.29
9,600.00	91.50	177.00	8,037.05	-1,838.02	-14.62	1.22	1,837.91	379,869.68	574,177.98
9,695.00	90.60	177.60	8,035.31	-1,932.90	-10.14	1.14	1,932.81	379,774.80	574,182.46
9,790.00	90.50	179.10	8,034.40	-2,027.85	-7.41	1.58	2,027.78	379,679.85	574,185.19
9,885.00	89.50	179.10	8,034.40	-2,122.84	-5.92	1.05	2,122.77	379,584.86	574,186.68
9,980.00	90.00	178.20	8,034.81	-2,217.81	-3.68	1.08	2,217.75	379,489.89	574,188.92
10,075.00	90.90	178.40	8,034.06	-2,312.77	-0.86	0.97	2,312.72	379,394.93	574,191.74
10,171.00	91.60	177.70	8,031.97	-2,408.69	2.40	1.03	2,408.66	379,299.01	574,195.00
10,266.00	89.00	177.50	8,031.47	-2,503.59	6.38	2.74	2,503.59	379,204.11	574,198.98
10,361.00	88.40	178.80	8,033.63	-2,598.52	9.45	1.51	2,598.53	379,109.18	574,202.05
10,456.00	89.40	179.10	8,035.45	-2,693.48	11.19	1.10	2,693.50	379,014.22	574,203.79
10,551.00	90.80	179.10	8,035.29	-2,788.47	12.68	1.47	2,788.50	378,919.23	574,205.28
10,646.00	91.90	178.90	8,033.05	-2,883.43	14.34	1.18	2,883.46	378,824.27	574,206.94



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
10,741.00	90.00	179.00	8,031.47	-2,978.39	16.08	2.00	2,978.44	378,729.31	574,208.68	
10,836.00	88.10	177.70	8,033.05	-3,073.33	18.81	2.42	3,073.39	378,634.37	574,211.41	
10,931.00	88.50	176.80	8,035.87	-3,168.18	23.37	1.04	3,168.26	378,539.52	574,215.97	
11,027.00	89.50	177.60	8,037.54	-3,264.05	28.06	1.33	3,264.16	378,443.65	574,220.66	
11,122.00	90.00	177.70	8,037.96	-3,358.97	31.95	0.54	3,359.10	378,348.73	574,224.55	
11,217.00	90.30	179.80	8,037.71	-3,453.94	34.03	2.23	3,454.08	378,253.76	574,226.63	
11,312.00	89.40	179.10	8,037.96	-3,548.94	34.94	1.20	3,549.08	378,158.76	574,227.54	
11,407.00	91.80	179.20	8,036.96	-3,643.91	36.35	2.53	3,644.06	378,063.79	574,228.95	
11,502.00	92.40	179.90	8,033.48	-3,738.84	37.09	0.97	3,739.00	377,968.86	574,229.69	
11,597.00	92.80	178.80	8,029.17	-3,833.74	38.17	1.23	3,833.90	377,873.96	574,230.77	
11,692.00	91.40	179.60	8,025.69	-3,928.66	39.49	1.70	3,928.83	377,779.04	574,232.09	
11,787.00	90.60	180.70	8,024.03	-4,023.65	39.25	1.43	4,023.81	377,684.05	574,231.85	
11,882.00	90.40	180.60	8,023.20	-4,118.64	38.17	0.24	4,118.79	377,589.06	574,230.77	
11,977.00	90.40	180.00	8,022.54	-4,213.63	37.67	0.63	4,213.78	377,494.07	574,230.27	
12,072.00	90.50	179.40	8,021.79	-4,308.63	38.17	0.64	4,308.78	377,399.07	574,230.77	
12,166.00	89.30	180.30	8,021.96	-4,402.62	38.41	1.60	4,402.77	377,305.08	574,231.01	
12,261.00	89.80	180.50	8,022.70	-4,497.62	37.75	0.57	4,497.76	377,210.08	574,230.35	
12,356.00	89.90	180.00	8,022.95	-4,592.62	37.34	0.54	4,592.76	377,115.08	574,229.94	
12,488.00	90.30	179.60	8,022.72	-4,724.62	37.80	0.43	4,724.76	376,983.08	574,230.40	
12,538.00	90.30	179.60	8,022.46	-4,774.61	38.15	0.00	4,774.75	376,933.09	574,230.75	

Survey projected to 12538 MD



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 2H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
Well:	Well 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.14	-0.46	Gyro
7,476.00	7,473.45	-83.87	-51.19	MWD surveys
12,538.00	8,022.46	-4,774.61	38.15	Survey projected to 12538 MD

Checked By: _____	Approved By: _____	Date: _____
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Concho COG Operating LLC
Eddy County, New Mexico
Graham Cracker 16 State
Well 2H
rev1
Patriot Rig 2

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	7345.00	2.01	219.22	7342.51	-81.65	-48.08	0.00	0.00	81.37	Survey @ 7345 MD
2	7592.14	2.01	219.22	7589.50	-88.37	-53.56	0.00	0.00	88.06	KOP Begin 12°/100' build/turn
3	8336.04	90.80	178.88	8054.03	-572.44	-54.82	12.00	-40.34	572.12	Begin 90.8° lateral
4	12565.81	90.80	178.88	7995.00	-4801.00	27.70	0.00	0.00	4801.08	PBHL/TD

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
100.00	100.00	0.55	287.41	0.14	-0.46	-0.15	0.48	Gyro
7473.45	7476.00	1.50	255.30	-83.87	-51.19	83.57	169.05	MWD surveys
8022.46	12538.00	90.30	179.60	-4774.61	38.15	4774.75	4864.78	Survey projected to 12538 MD

Surface Location: RKB=3072.2+17 @ 3089.20usft (Patriot Rig 2)
US State Plane 1927 (Exact solution)
New Mexico East 3001

Northing 381707.70 Easting 574192.60 32° 2' 57.13165629 N 04° 5' 37.93417266 W

Total Correction (M → G) To convert a Magnetic Direction to a Grid Direction, Add 7.41°

N-ZONE



Azimuths to Grid North
True North: -0.13°
Magnetic North: 7.41°

Magnetic Field
Strength: 48235.4nT
Dip Angle: 59.88°
Date: 8/30/2013
Model: IGRF2010

