

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Graham Cracker 16 state # 3 H
COUNTY: Eddy Co., New Mexico
Sec. 16, T26S, R28E

15-41633

**STATE OF NEW MEXICO
DEVIATION REPORT**

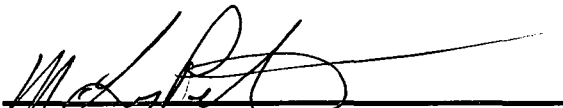
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
274	1	6,886	1 3/4
607	1 1/2	7,224	3
883	1 1/2	7,447	2 1/2
1,168	1 3/4		
1,263	1 3/4		
1,452	2		
1,574	2		
1,738	2		
1,927	2 1/4		
2,211	1 3/4		
2,390	1 3/4		
2,903	1 1/2		
3,366	1 1/2		
4,318	3/4		
5,306	1 1/4		
5,801	1		
6,316	1 3/4		
6,599	2		

RECEIVED

JAN 06 2014

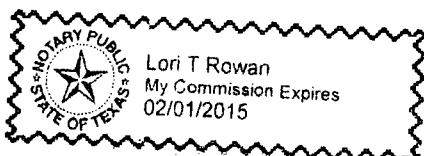
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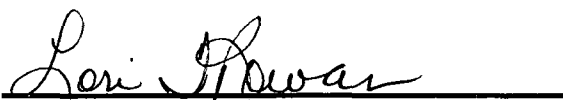
Patriot Drilling, LLC

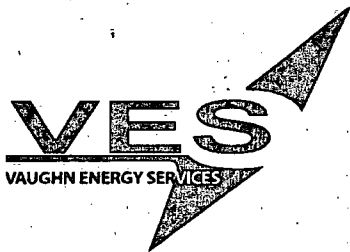

M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 9th day of October, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




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

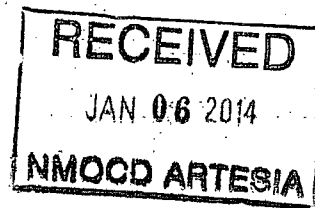


A GYRO TECHNOLOGIES INC. COMPANY

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

October 11, 2013

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



Attn: Kanicia Castillo

RE: **Graham Cracker 16 State 3H**

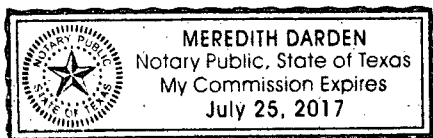
Please find enclosed a copy of the survey from 0.00' to 7350.00' ran on the above referenced well.

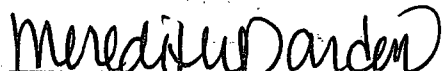
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 11 day of October, A.D., 2013, by Keith Havelka..




Meredith Darden
Notary Public, State of Texas



Company: COG Operating, LLC (Concho)
Lease/Well: Graham Cracker 16 State/3H
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: graham cracker #3h-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/11/2013 / 10:31

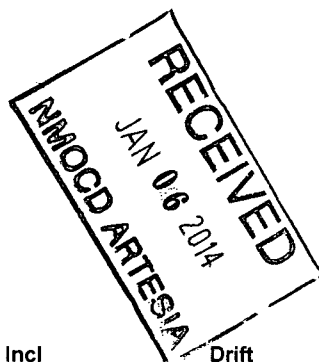
Vaughn Energy Services

West, Texas

432-563-5444

Surveyor: Chris Bankson

Graham Cracker 16 State 3H / API 30-015-41633



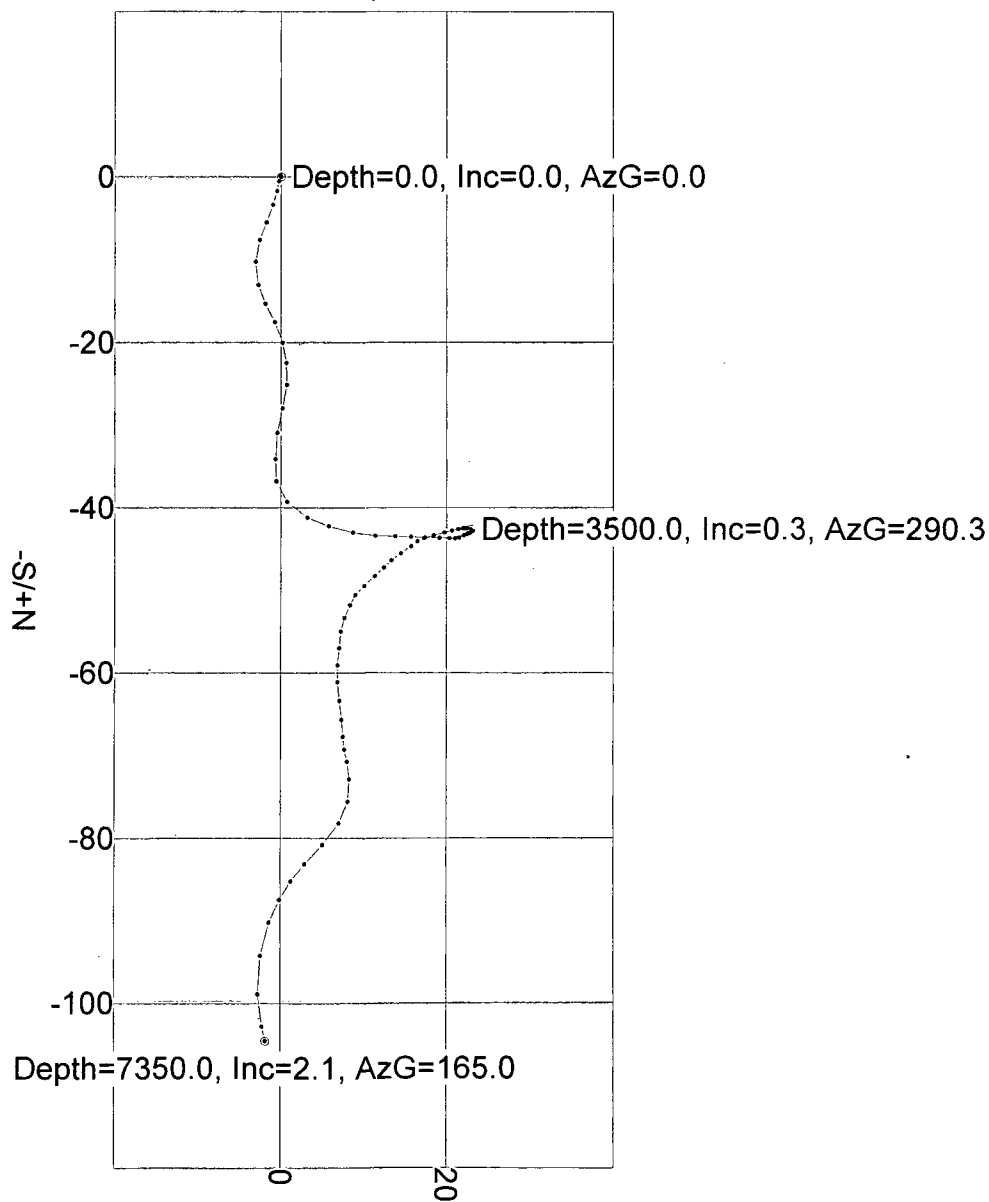
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.19	341.52	100.00	0.16	-0.05	0.16	0.16	341.52	0.19
200.00	0.11	194.91	200.00	0.22	-0.13	0.22	0.26	330.05	0.28
300.00	0.73	190.79	300.00	-0.49	-0.27	-0.49	0.56	208.77	0.63
400.00	0.68	190.75	399.99	-1.70	-0.50	-1.70	1.78	196.40	0.05
500.00	1.32	199.07	499.97	-3.38	-0.99	-3.38	3.52	196.33	0.66
600.00	1.25	199.78	599.95	-5.49	-1.74	-5.49	5.76	197.53	0.08
700.00	1.35	203.24	699.92	-7.60	-2.57	-7.60	8.03	198.67	0.13
800.00	1.79	180.62	799.89	-10.25	-3.05	-10.25	10.69	196.59	0.75
900.00	1.46	164.79	899.85	-13.03	-2.74	-13.03	13.32	191.86	0.55
1000.00	1.32	154.52	999.82	-15.30	-1.91	-15.30	15.42	187.11	0.29
1100.00	1.54	151.31	1099.79	-17.52	-0.77	-17.52	17.53	182.51	0.24
1200.00	1.55	166.89	1199.75	-20.01	0.19	-20.01	20.02	179.46	0.42
1300.00	1.28	173.09	1299.72	-22.44	0.63	-22.44	22.45	178.40	0.31
1400.00	1.78	182.20	1399.68	-25.10	0.70	-25.10	25.11	178.40	0.55
1500.00	1.58	199.59	1499.64	-27.95	0.18	-27.95	27.95	179.63	0.54
1600.00	1.93	186.32	1599.59	-30.92	-0.47	-30.92	30.92	180.87	0.53
1700.00	1.73	181.36	1699.54	-34.10	-0.69	-34.10	34.11	181.16	0.25
1800.00	1.37	172.90	1799.51	-36.80	-0.58	-36.80	36.81	180.90	0.43

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	1.96	137.58	1899.47	-39.25	0.73	-39.25	39.26	178.94	1.16
2000.00	1.64	117.70	1999.42	-41.18	3.15	-41.18	41.30	175.63	0.70
2100.00	1.60	105.56	2099.38	-42.22	5.76	-42.22	42.61	172.23	0.35
2200.00	1.80	103.61	2199.33	-42.96	8.63	-42.96	43.82	168.65	0.21
2300.00	1.42	91.32	2299.29	-43.36	11.39	-43.36	44.83	165.28	0.51
2400.00	1.31	91.38	2399.27	-43.42	13.78	-43.42	45.55	162.39	0.11
2500.00	0.89	94.17	2499.25	-43.50	15.70	-43.50	46.25	160.16	0.42
2600.00	1.06	91.56	2599.23	-43.58	17.39	-43.58	46.93	158.24	0.17
2700.00	0.95	92.11	2699.22	-43.64	19.14	-43.64	47.65	156.32	0.11
2800.00	0.47	91.04	2799.21	-43.68	20.37	-43.68	48.19	154.99	0.48
2900.00	0.27	92.35	2899.21	-43.69	21.02	-43.69	48.49	154.31	0.19
3000.00	0.31	68.44	2999.21	-43.60	21.51	-43.60	48.62	153.74	0.13
3100.00	0.43	65.58	3099.20	-43.35	22.11	-43.35	48.66	152.98	0.12
3200.00	0.08	54.33	3199.20	-43.15	22.51	-43.15	48.67	152.45	0.35
3300.00	0.31	68.30	3299.20	-43.01	22.82	-43.01	48.69	152.05	0.23
3400.00	0.16	29.09	3399.20	-42.79	23.13	-42.79	48.64	151.60	0.21
3500.00	0.33	290.28	3499.20	-42.57	22.93	-42.57	48.35	151.69	0.39
3600.00	0.19	277.68	3599.20	-42.45	22.49	-42.45	48.04	152.08	0.16
3700.00	0.15	261.37	3699.20	-42.45	22.20	-42.45	47.90	152.39	0.06
3800.00	0.10	262.23	3799.20	-42.48	21.98	-42.48	47.83	152.64	0.06
3900.00	0.54	257.73	3899.20	-42.59	21.44	-42.59	47.68	153.28	0.45
4000.00	0.36	256.54	3999.19	-42.76	20.66	-42.76	47.49	154.21	0.18
4100.00	0.75	256.93	4099.19	-42.99	19.71	-42.99	47.29	155.36	0.39
4200.00	0.75	252.06	4199.18	-43.34	18.45	-43.34	47.10	156.93	0.06
4300.00	0.65	254.92	4299.17	-43.68	17.29	-43.68	46.98	158.41	0.11
4400.00	0.37	228.62	4399.17	-44.05	16.50	-44.05	47.03	159.47	0.36
4500.00	0.74	232.49	4499.16	-44.65	15.74	-44.65	47.35	160.58	0.37
4600.00	0.99	238.75	4599.15	-45.49	14.50	-45.49	47.74	162.32	0.27
4700.00	0.67	225.75	4699.14	-46.35	13.34	-46.35	48.23	163.94	0.37
4800.00	0.79	226.98	4799.13	-47.23	12.41	-47.23	48.83	165.27	0.12
4900.00	0.94	225.77	4899.12	-48.27	11.32	-48.27	49.58	166.80	0.15
5000.00	1.05	230.47	4999.11	-49.43	10.03	-49.43	50.43	168.53	0.14
5100.00	0.73	214.92	5099.10	-50.53	8.95	-50.53	51.32	169.95	0.40
5200.00	0.87	202.92	5199.09	-51.76	8.29	-51.76	52.42	170.90	0.22
5300.00	1.06	202.08	5299.07	-53.31	7.65	-53.31	53.86	171.84	0.19
5400.00	0.93	186.59	5399.06	-54.97	7.21	-54.97	55.44	172.53	0.30
5500.00	1.37	183.77	5499.04	-56.96	7.04	-56.96	57.40	172.96	0.44
5600.00	1.04	186.94	5599.01	-59.06	6.85	-59.06	59.45	173.39	0.33
5700.00	1.28	175.81	5698.99	-61.07	6.82	-61.07	61.45	173.63	0.32

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.33	172.62	5798.97	-63.34	7.05	-63.34	63.73	173.65	0.09
5900.00	1.29	175.12	5898.94	-65.61	7.30	-65.61	66.02	173.65	0.07
6000.00	1.09	175.02	5998.92	-67.68	7.47	-67.68	68.09	173.70	0.20
6100.00	0.72	172.56	6098.91	-69.24	7.64	-69.24	69.66	173.71	0.37
6200.00	0.98	163.74	6198.90	-70.69	7.96	-70.69	71.14	173.58	0.30
6300.00	1.51	177.42	6298.87	-72.83	8.26	-72.83	73.30	173.53	0.60
6400.00	1.61	190.87	6398.84	-75.53	8.05	-75.53	75.96	173.91	0.38
6500.00	1.71	212.24	6498.80	-78.18	6.99	-78.18	78.49	174.89	0.62
6600.00	2.03	221.16	6598.74	-80.77	5.03	-80.77	80.93	176.44	0.43
6700.00	1.63	223.67	6698.69	-83.13	2.88	-83.13	83.18	178.01	0.41
6800.00	1.43	213.75	6798.66	-85.20	1.21	-85.20	85.21	179.19	0.33
6900.00	1.58	208.89	6898.62	-87.44	-0.15	-87.44	87.44	180.10	0.19
7000.00	1.87	201.18	6998.58	-90.17	-1.41	-90.17	90.18	180.89	0.37
7100.00	2.94	190.04	7098.49	-94.22	-2.45	-94.22	94.25	181.49	1.16
7200.00	2.46	176.09	7198.38	-98.88	-2.75	-98.88	98.92	181.59	0.81
7300.00	2.07	169.08	7298.30	-102.80	-2.26	-102.80	102.82	181.26	0.47
7350.00	2.11	164.98	7348.27	-104.57	-1.85	-104.57	104.59	181.01	0.31



Vaughn Energy Services
West, Texas
432-563-5444
Surveyor: Chris Bankson
Graham Cracker 16 State 3H / API 30-015-41633



-W/+E
VES Survey Date: 10/21/2013



Concho COG Operating LLC

Eddy County, New Mexico

Graham Cracker 16 State

Well 3H

Original Hole

Design: Surveys Original Hole

Standard_report

08 October, 2013

N=ONE



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 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	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 3H				
Well Position	+N/-S	0.00 usft	Northing:	381,705.60 usft	Latitude:	32° 2' 57.08140891 N
	+E/-W	0.00 usft	Easting:	575,523.10 usft	Longitude:	104° 5' 22.47487238 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,056.30 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/20/2013	7.53	59.88	48,230

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	177.64



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well-Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey Program

Date 10/8/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	7,350.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
7,447.00	12,520.00	MWD (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	381,705.60	575,523.10
100.00	0.19	341.52	100.00	0.16	-0.05	0.19	-0.16	381,705.76	575,523.05
Gyro									
200.00	0.11	194.91	200.00	0.22	-0.13	0.29	-0.23	381,705.82	575,522.97
300.00	0.73	190.79	300.00	-0.50	-0.27	0.62	0.49	381,705.10	575,522.83
400.00	0.68	190.75	399.99	-1.71	-0.50	0.05	1.68	381,703.89	575,522.60
500.00	1.32	199.07	499.97	-3.38	-0.99	0.65	3.33	381,702.22	575,522.11
600.00	1.25	199.78	599.95	-5.49	-1.74	0.07	5.42	381,700.11	575,521.36
700.00	1.35	203.24	699.92	-7.60	-2.57	0.13	7.49	381,698.00	575,520.53
800.00	1.79	180.62	799.89	-10.25	-3.05	0.75	10.11	381,695.35	575,520.05
900.00	1.46	164.79	899.85	-13.04	-2.73	0.55	12.91	381,692.56	575,520.37
1,000.00	1.32	154.52	999.82	-15.31	-1.90	0.29	15.21	381,690.29	575,521.20
1,100.00	1.54	151.31	1,099.79	-17.52	-0.76	0.23	17.48	381,688.08	575,522.34
1,200.00	1.55	166.89	1,199.75	-20.02	0.19	0.42	20.01	381,685.58	575,523.29
1,300.00	1.28	173.09	1,299.72	-22.45	0.63	0.31	22.45	381,683.15	575,523.73
1,400.00	1.78	182.20	1,399.68	-25.11	0.70	0.55	25.11	381,680.49	575,523.80
1,500.00	1.58	199.59	1,499.64	-27.96	0.18	0.54	27.94	381,677.64	575,523.28
1,600.00	1.93	186.32	1,599.59	-30.93	-0.47	0.53	30.88	381,674.67	575,522.63
1,700.00	1.73	181.36	1,699.54	-34.11	-0.69	0.25	34.06	381,671.49	575,522.41
1,800.00	1.37	172.90	1,799.51	-36.81	-0.58	0.43	36.75	381,668.79	575,522.52
1,900.00	1.96	137.58	1,899.47	-39.26	0.73	1.16	39.25	381,666.34	575,523.83



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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)
2,000.00	1.64	117.70	1,999.42	-41.18	3.15	0.70	41.28	381,664.42	575,526.25
2,100.00	1.60	105.56	2,099.38	-42.22	5.76	0.34	42.43	381,663.38	575,528.86
2,200.00	1.80	103.61	2,199.33	-42.97	8.63	0.21	43.29	381,662.63	575,531.73
2,300.00	1.42	91.32	2,299.29	-43.37	11.40	0.51	43.80	381,662.23	575,534.50
2,400.00	1.31	91.38	2,399.27	-43.42	13.78	0.11	43.95	381,662.18	575,536.88
2,500.00	0.89	94.17	2,499.25	-43.51	15.69	0.42	44.12	381,662.09	575,538.79
2,600.00	1.06	91.56	2,599.23	-43.59	17.39	0.18	44.27	381,662.01	575,540.49
2,700.00	0.95	92.11	2,699.22	-43.64	19.15	0.11	44.40	381,661.96	575,542.25
2,800.00	0.47	91.04	2,799.21	-43.68	20.38	0.48	44.48	381,661.92	575,543.48
2,900.00	0.27	92.35	2,899.21	-43.70	21.03	0.20	44.53	381,661.90	575,544.13
3,000.00	0.31	68.44	2,999.21	-43.61	21.52	0.13	44.46	381,661.99	575,544.62
3,100.00	0.43	65.58	3,099.20	-43.35	22.11	0.12	44.23	381,662.25	575,545.21
3,200.00	0.08	54.33	3,199.20	-43.16	22.51	0.35	44.05	381,662.44	575,545.61
3,300.00	0.31	68.30	3,299.20	-43.02	22.82	0.23	43.92	381,662.58	575,545.92
3,400.00	0.16	29.09	3,399.20	-42.80	23.14	0.21	43.71	381,662.80	575,546.24
3,500.00	0.33	290.28	3,499.20	-42.57	22.93	0.39	43.48	381,663.03	575,546.03
3,600.00	0.19	277.68	3,599.20	-42.45	22.50	0.15	43.34	381,663.15	575,545.60
3,700.00	0.15	261.37	3,699.20	-42.45	22.21	0.06	43.33	381,663.15	575,545.31
3,800.00	0.10	262.23	3,799.20	-42.48	21.99	0.05	43.35	381,663.12	575,545.09
3,900.00	0.54	257.73	3,899.20	-42.59	21.44	0.44	43.44	381,663.01	575,544.54
4,000.00	0.36	256.54	3,999.19	-42.77	20.68	0.18	43.58	381,662.83	575,543.78
4,100.00	0.75	256.93	4,099.19	-42.99	19.73	0.39	43.76	381,662.61	575,542.83
4,200.00	0.75	252.06	4,199.18	-43.34	18.47	0.06	44.06	381,662.26	575,541.57
4,300.00	0.65	254.92	4,299.17	-43.69	17.30	0.11	44.36	381,661.91	575,540.40
4,400.00	0.37	228.62	4,399.17	-44.05	16.51	0.36	44.69	381,661.55	575,539.61
4,500.00	0.74	232.49	4,499.16	-44.65	15.76	0.37	45.26	381,660.95	575,538.86
4,600.00	0.99	238.75	4,599.15	-45.50	14.51	0.27	46.05	381,660.10	575,537.61



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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	0.67	225.75	4,699.14	-46.35	13.35	0.37	46.86	381,659.25	575,536.45
4,800.00	0.79	226.98	4,799.13	-47.23	12.43	0.12	47.70	381,658.37	575,535.53
4,900.00	0.94	225.77	4,899.12	-48.27	11.34	0.15	48.70	381,657.33	575,534.44
5,000.00	1.05	230.47	4,999.11	-49.43	10.04	0.14	49.80	381,656.17	575,533.14
5,100.00	0.73	214.92	5,099.10	-50.53	8.97	0.40	50.86	381,655.07	575,532.07
5,200.00	0.87	202.92	5,199.09	-51.75	8.31	0.22	52.05	381,653.85	575,531.41
5,300.00	1.06	202.08	5,299.07	-53.31	7.67	0.19	53.58	381,652.29	575,530.77
5,400.00	0.93	186.59	5,399.06	-54.97	7.23	0.30	55.23	381,650.63	575,530.33
5,500.00	1.37	183.77	5,499.04	-56.97	7.05	0.44	57.22	381,648.63	575,530.15
5,600.00	1.04	186.94	5,599.01	-59.07	6.87	0.34	59.30	381,646.53	575,529.97
5,700.00	1.28	175.81	5,698.99	-61.08	6.84	0.33	61.31	381,644.52	575,529.94
5,800.00	1.33	172.62	5,798.97	-63.35	7.07	0.09	63.58	381,642.25	575,530.17
5,900.00	1.29	175.12	5,898.94	-65.62	7.31	0.07	65.86	381,639.98	575,530.41
6,000.00	1.09	175.02	5,998.92	-67.69	7.49	0.20	67.94	381,637.91	575,530.59
6,100.00	0.72	172.56	6,098.91	-69.26	7.66	0.37	69.52	381,636.34	575,530.76
6,200.00	0.98	163.74	6,198.90	-70.70	7.98	0.29	70.97	381,634.90	575,531.08
6,300.00	1.51	177.42	6,298.87	-72.84	8.28	0.60	73.12	381,632.76	575,531.38
6,400.00	1.61	190.87	6,398.84	-75.54	8.07	0.38	75.80	381,630.06	575,531.17
6,500.00	1.71	212.24	6,498.80	-78.18	7.01	0.62	78.40	381,627.42	575,530.11
6,600.00	2.03	221.16	6,598.74	-80.77	5.05	0.43	80.91	381,624.83	575,528.15
6,700.00	1.63	223.67	6,698.69	-83.14	2.90	0.41	83.18	381,622.46	575,526.00
6,800.00	1.43	213.75	6,798.66	-85.20	1.22	0.33	85.18	381,620.40	575,524.32
6,900.00	1.58	208.89	6,898.62	-87.45	-0.14	0.20	87.37	381,618.15	575,522.96
7,000.00	1.87	201.18	6,998.58	-90.17	-1.39	0.37	90.04	381,615.43	575,521.71
7,100.00	2.94	190.04	7,098.49	-94.22	-2.43	1.16	94.04	381,611.38	575,520.67
7,200.00	2.46	176.09	7,198.38	-98.89	-2.73	0.81	98.69	381,606.71	575,520.37
7,300.00	2.07	169.08	7,298.30	-102.80	-2.24	0.48	102.62	381,602.80	575,520.86



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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)	
7,350.00	2.11	164.98	7,348.26	-104.58	-1.83	0.31	104.41	381,601.02	575,521.27	
7,447.00	2.30	169.60	7,445.19	-108.22	-1.02	0.27	108.08	381,597.38	575,522.08	
MWD surveys										
7,479.00	2.20	180.00	7,477.17	-109.46	-0.90	1.31	109.33	381,596.14	575,522.20	
7,511.00	3.50	185.30	7,509.13	-111.05	-0.99	4.14	110.91	381,594.55	575,522.11	
7,543.00	5.90	185.40	7,541.02	-113.66	-1.24	7.50	113.51	381,591.94	575,521.86	
7,575.00	8.00	186.30	7,572.78	-117.51	-1.63	6.57	117.34	381,588.09	575,521.47	
7,606.00	9.80	184.10	7,603.41	-122.29	-2.06	5.91	122.10	381,583.31	575,521.04	
7,638.00	12.00	183.00	7,634.83	-128.33	-2.43	6.91	128.12	381,577.27	575,520.67	
7,670.00	14.00	182.70	7,666.01	-135.52	-2.79	6.25	135.29	381,570.08	575,520.31	
7,702.00	15.80	182.20	7,696.93	-143.74	-3.13	5.64	143.48	381,561.86	575,519.97	
7,733.00	19.00	179.10	7,726.51	-153.00	-3.22	10.74	152.74	381,552.60	575,519.88	
7,765.00	23.40	178.00	7,756.33	-164.57	-2.91	13.81	164.31	381,541.03	575,520.19	
7,797.00	27.90	179.30	7,785.17	-178.41	-2.60	14.17	178.15	381,527.19	575,520.50	
7,828.00	32.20	179.80	7,812.00	-193.93	-2.48	13.89	193.66	381,511.67	575,520.62	
7,860.00	36.70	180.80	7,838.38	-212.03	-2.59	14.17	211.74	381,493.57	575,520.51	
7,890.00	41.10	180.50	7,861.72	-230.86	-2.80	14.68	230.55	381,474.74	575,520.30	
7,922.00	45.30	179.20	7,885.05	-252.76	-2.73	13.42	252.43	381,452.84	575,520.37	
7,953.00	48.70	177.60	7,906.19	-275.42	-2.09	11.60	275.10	381,430.18	575,521.01	
7,985.00	52.30	176.30	7,926.54	-300.07	-0.77	11.68	299.78	381,405.53	575,522.33	
8,017.00	56.40	176.80	7,945.18	-326.02	0.79	12.88	325.77	381,379.58	575,523.89	
8,049.00	60.80	176.20	7,961.85	-353.27	2.46	13.84	353.08	381,352.33	575,525.56	
8,080.00	64.20	175.50	7,976.16	-380.69	4.46	11.15	380.56	381,324.91	575,527.56	
8,112.00	66.70	175.60	7,989.46	-409.71	6.71	7.82	409.64	381,295.89	575,529.81	
8,143.00	68.60	175.70	8,001.25	-438.30	8.89	6.14	438.29	381,267.30	575,531.99	
8,175.00	71.50	176.00	8,012.16	-468.30	11.06	9.11	468.36	381,237.30	575,534.16	
8,207.00	74.60	176.50	8,021.49	-498.84	13.06	9.80	498.95	381,206.76	575,536.16	



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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)	
8,238.00	77.40	176.10	8,028.99	-528.85	15.01	9.12	529.02	381,176.75	575,538.11	
8,270.00	79.70	177.50	8,035.34	-560.16	16.75	8.37	560.38	381,145.44	575,539.85	
8,302.00	82.90	178.20	8,040.18	-591.77	17.94	10.23	592.00	381,113.83	575,541.04	
8,333.00	86.80	178.50	8,042.96	-622.62	18.83	12.62	622.87	381,082.98	575,541.93	
8,365.00	88.40	178.80	8,044.30	-654.59	19.58	5.09	654.84	381,051.01	575,542.68	
8,460.00	89.60	178.60	8,045.96	-749.54	21.74	1.28	749.80	380,956.06	575,544.84	
8,556.00	90.50	178.30	8,045.88	-845.51	24.33	0.99	845.79	380,860.09	575,547.43	
8,651.00	89.60	177.30	8,045.80	-940.44	27.98	1.42	940.79	380,765.16	575,551.08	
8,746.00	90.20	176.80	8,045.96	-1,035.31	32.87	0.82	1,035.78	380,670.29	575,555.97	
8,841.00	89.60	175.40	8,046.13	-1,130.09	39.33	1.60	1,130.75	380,575.51	575,562.43	
8,935.00	90.50	174.90	8,046.05	-1,223.75	47.28	1.10	1,224.66	380,481.85	575,570.38	
9,030.00	89.50	177.20	8,046.05	-1,318.52	53.82	2.64	1,319.61	380,387.08	575,576.92	
9,126.00	90.70	177.20	8,045.88	-1,414.40	58.51	1.25	1,415.61	380,291.20	575,581.61	
9,221.00	89.10	178.00	8,046.04	-1,509.31	62.49	1.88	1,510.60	380,196.29	575,585.59	
9,316.00	90.50	177.80	8,046.38	-1,604.24	65.97	1.49	1,605.60	380,101.36	575,589.07	
9,411.00	89.40	177.70	8,046.46	-1,699.17	69.70	1.16	1,700.60	380,006.43	575,592.80	
9,506.00	91.20	177.80	8,045.96	-1,794.09	73.43	1.90	1,795.59	379,911.51	575,596.53	
9,602.00	89.30	176.20	8,045.54	-1,889.95	78.45	2.59	1,891.58	379,815.65	575,601.55	
9,697.00	90.50	175.40	8,045.71	-1,984.69	85.41	1.52	1,986.53	379,720.91	575,608.51	
9,792.00	88.80	175.00	8,046.29	-2,079.36	93.36	1.84	2,081.44	379,626.24	575,616.46	
9,887.00	90.40	174.30	8,046.95	-2,173.94	102.22	1.84	2,176.30	379,531.66	575,625.32	
9,981.00	88.30	173.90	8,048.02	-2,267.43	111.88	2.27	2,270.11	379,438.17	575,634.98	
10,077.00	89.60	172.90	8,049.78	-2,362.77	122.91	1.71	2,365.83	379,342.83	575,646.01	
10,172.00	88.70	174.00	8,051.19	-2,457.14	133.75	1.50	2,460.56	379,248.46	575,656.85	
10,267.00	89.60	176.50	8,052.60	-2,551.79	141.61	2.80	2,555.46	379,153.81	575,664.71	
10,362.00	88.90	178.30	8,053.84	-2,646.68	145.92	2.03	2,650.45	379,058.92	575,669.02	
10,457.00	90.30	178.60	8,054.50	-2,741.64	148.49	1.51	2,745.43	378,963.96	575,671.59	



Standard_report



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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)	
10,553.00	92.00	178.30	8,052.58	-2,837.58	151.09	1.80	2,841.40	378,868.02	575,674.19	
10,648.00	91.60	179.00	8,049.59	-2,932.51	153.32	0.85	2,936.34	378,773.09	575,676.42	
10,743.00	90.50	178.80	8,047.85	-3,027.48	155.15	1.18	3,031.30	378,678.12	575,678.25	
10,837.00	92.30	178.50	8,045.55	-3,121.42	157.36	1.94	3,125.25	378,584.18	575,680.46	
10,932.00	90.70	177.90	8,043.07	-3,216.33	160.34	1.80	3,220.21	378,489.27	575,683.44	
11,027.00	90.00	178.20	8,042.49	-3,311.28	163.58	0.80	3,315.20	378,394.32	575,686.68	
11,122.00	89.80	179.30	8,042.65	-3,406.25	165.65	1.18	3,410.18	378,299.35	575,688.75	
11,218.00	89.50	178.60	8,043.24	-3,502.23	167.41	0.79	3,506.16	378,203.37	575,690.51	
11,313.00	90.80	178.40	8,042.99	-3,597.20	169.89	1.38	3,601.14	378,108.40	575,692.99	
11,408.00	88.10	177.90	8,043.90	-3,692.14	172.96	2.89	3,696.13	378,013.46	575,696.06	
11,503.00	89.70	177.80	8,045.73	-3,787.05	176.52	1.69	3,791.11	377,918.55	575,699.62	
11,599.00	91.00	177.80	8,045.14	-3,882.97	180.21	1.35	3,887.10	377,822.63	575,703.31	
11,694.00	90.00	178.70	8,044.31	-3,977.92	183.11	1.42	3,982.09	377,727.68	575,706.21	
11,789.00	92.70	179.10	8,042.07	-4,072.87	184.93	2.87	4,077.03	377,632.73	575,708.03	
11,884.00	91.60	179.20	8,038.51	-4,167.79	186.34	1.16	4,171.93	377,537.81	575,709.44	
11,979.00	87.70	178.80	8,039.09	-4,262.76	188.00	4.13	4,266.88	377,442.84	575,711.10	
12,074.00	91.60	178.80	8,039.67	-4,357.72	189.99	4.11	4,361.84	377,347.88	575,713.09	
12,169.00	89.80	178.40	8,038.51	-4,452.68	192.31	1.94	4,456.82	377,252.92	575,715.41	
12,264.00	89.50	178.80	8,039.09	-4,547.65	194.63	0.53	4,551.80	377,157.95	575,717.73	
12,360.00	91.00	179.70	8,038.67	-4,643.63	195.89	1.82	4,647.76	377,061.97	575,718.99	
12,473.00	94.00	179.40	8,033.74	-4,756.51	196.77	2.67	4,760.58	376,949.09	575,719.87	
12,520.00	94.00	179.40	8,030.46	-4,803.39	197.26	0.00	4,807.44	376,902.21	575,720.36	

Survey projected to 12520 MD



Company:	Concho COG Operating LLC	Local Co-ordinate Reference:	Well Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Site:	Graham Cracker 16 State	MD Reference:	RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
Well:	Well 3H	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	0.16	-0.05	Gyro
7,447.00	7,445.19	-108.22	-1.02	MWD surveys
12,520.00	8,030.46	-4,803.39	197.26	Survey projected to 12520 MD

Checked By: _____ Approved By: _____ Date: _____



Concho COG Operating LLC
Eddy County, New Mexico
Graham Cracker 16 State
Well 3H
rev1
Original Well Elev

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	7350.00	2.11	164.98	7348.26	-104.58	-1.83	0.00	0.00	104.41	Survey @ 7350 MD
2	7593.90	2.11	164.98	7592.00	-113.25	0.50	0.00	0.00	113.17	KOP Begin 12°/100' bu
3	8327.80	90.13	177.63	8052.30	-590.80	24.00	12.00	12.66	591.38	Begin 90.13° lateral
4	12544.42	90.13	177.63	8043.00	-4803.90	198.40	0.00	0.00	4808.00	PBHL/TD

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
100.00	100.00	0.19	341.52	0.16	-0.05	-0.16	0.17	Gyro
7445.19	7447.00	2.30	169.60	-108.22	-1.02	108.08	144.27	MWD surveys
8030.46	12520.00	94.00	179.40	-4803.39	197.26	4807.44	4845.72	Survey projected to 12520 MD

Surface Location: RKB=3056.3+17 @ 3073.30usft (Original Well Elev)
US State Plane 1927 (Exact solution)
New Mexico East 3001

Northing Easting Latitude Longitude
381705.60 575523.10 32° 2' 57.08140891 N 04° 5' 22.47487238 W

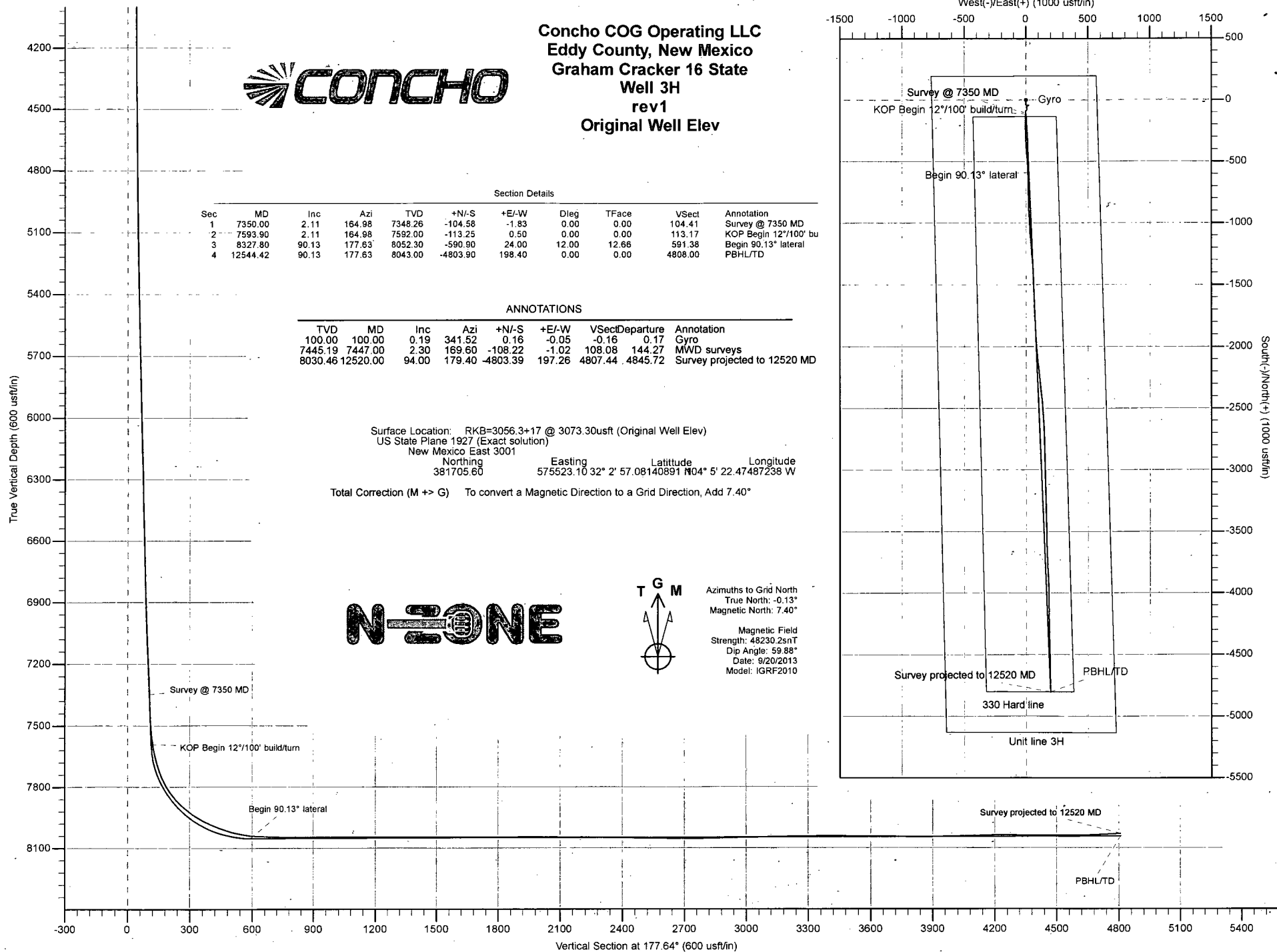
Total Correction (M ↔ G) To convert a Magnetic Direction to a Grid Direction, Add 7.40°

N=ONE



Azimuths to Grid North
True North: -0.13°
Magnetic North: 7.40°

Magnetic Field
Strength: 48230.25nT
Dip Angle: 59.88°
Date: 9/20/2013
Model: IGRF2010



Vertical Section at 177.64° (600 usft/in)

