



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

30-015-40481



December 7, 2012

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Cluster State Com #4H
1887' FSL & 190' FWL
Sec. 16, T26S, R17E
Eddy County, New Mexico

Dear Sir,

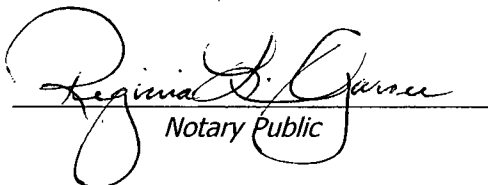
The attached is the Deviation Survey for the above captioned well.

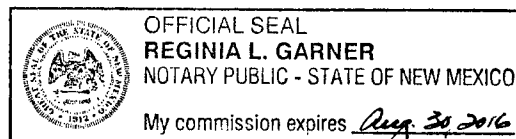
Very truly yours,


Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 7th day of December, 2012.


Notary Public



Pason DataHub Deviation Survey

Well Dossier 1353457089 - CLUSTER STATE COM 4H

# Date	Depth	Deviation	Direction	TVD
11/21/2012	187	1.10	84.50	186.99
11/21/2012	273	1.60	90.00	272.96
11/21/2012	361	1.40	97.40	390.93
11/21/2012	450	1.20	93.70	449.91
11/21/2012	544	1.20	94.50	543.89
11/21/2012	830	1.30	114.40	829.82
11/22/2012	1021	2.90	81.40	1020.71
11/22/2012	1117	3.60	64.80	1116.56
11/22/2012	1308	4.30	54.50	1307.05
11/22/2012	1403	4.20	61.00	1401.79
11/22/2012	1499	4.10	59.40	1794.58
11/22/2012	1594	3.30	32.30	1592.35
11/22/2012	1690	2.60	15.80	1688.22
11/23/2012	1976	2.10	27.50	1973.96
11/25/2012	2614	0.00	1.10	0.00
11/25/2012	3096	1.00	0.00	0.00
11/25/2012	3573	1.10	0.00	0.00
11/25/2012	4050	4.20	0.00	0.00
11/25/2012	4146	0.40	0.00	0.00
11/26/2012	4588	1.40	1.00	0.00
11/26/2012	4875	1.60	0.00	0.00
11/26/2012	5352	1.90	0.00	0.00
11/26/2012	5832	1.60	0.00	0.00
11/27/2012	6310	1.10	0.00	6388.00
11/28/2012	6642	1.00	159.40	6638.95
11/28/2012	6738	1.40	145.30	6734.93
11/28/2012	6833	1.10	144.80	6829.90
11/29/2012	7024	3.20	114.90	7020.79
11/29/2012	7087	13.60	89.80	7083.10
11/29/2012	7119	16.90	102.50	7113.97
11/29/2012	7214	26.70	90.70	7202.00
11/29/2012	7342	36.30	88.70	7310.00
11/30/2012	7373	39.00	86.60	7334.88
11/30/2012	7405	41.10	85.40	7359.32
11/30/2012	7469	47.70	86.30	7405.04
11/30/2012	7533	55.90	89.80	7444.00
11/30/2012	7692	70.50	93.70	7517.00
11/30/2012	7820	84.80	89.80	7546.00
11/30/2012	7851	86.40	89.80	7548.80
12/1/2012	7883	86.40	88.70	7550.82
12/1/2012	8174	85.90	90.30	7567.00
12/1/2012	8270	84.60	90.00	7575.00

12/1/2012	8651	86.30	90.50	759.57
12/1/2012	8747	88.50	90.70	7599.92
12/1/2012	9128	89.90	91.70	7611.56
12/2/2012	9033	87.30	91.00	7609.74
12/2/2012	9511	88.60	89.30	7616.99
12/2/2012	9988	90.00	91.90	7609.00
12/2/2012	10083	86.40	92.10	7612.00
12/2/2012	10179	84.80	91.60	7619.00
12/2/2012	10274	89.60	91.60	7628.16
12/2/2012	10369	86.10	93.80	7635.86
12/2/2012	10465	87.10	93.10	7641.55
12/3/2012	10559	88.50	92.30	7645.16
12/3/2012	10749	88.50	92.10	7648.93
12/3/2012	10844	88.70	91.40	7650.96
12/3/2012	10940	87.20	90.90	7654.40
12/3/2012	11036	87.00	90.00	7639.25
12/3/2012	11226	85.80	87.90	7673.00
12/3/2012	11322	85.90	88.00	7680.00
12/3/2012	11417	86.30	89.40	7687.25
12/3/2012	11513	90.70	87.90	7689.76
12/4/2012	11608	90.60	86.50	7688.69
12/4/2012	11704	90.20	86.30	7688.02
12/4/2012	11800	90.10	85.80	7687.76
12/4/2012	11895	89.40	86.50	7688.18

EOF

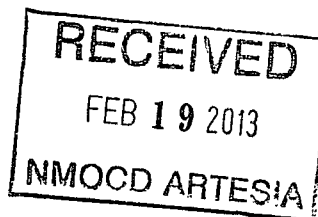


A GYRO TECHNOLOGIES INC. COMPANY

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

December 3, 2012

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701



Attn: Kanica Castillo

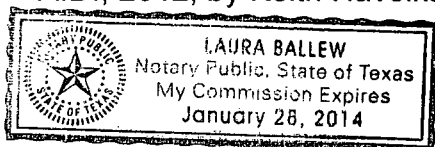
RE: **Cluster State Com No. 004H**

Please find enclosed a copy of the survey from 0.00' to 6530.00' ran on the above referenced well.

If I can be of any further service please do not hesitate to call me at 800-606-4976.

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 6th day of December, A.D., 2012, by Keith Havelka.



Laura Ballew
Notary Public, State of Texas

Sincerely,

Keith Havelka
Operations



Company: COG Operating LLC (Concho)
 Lease/Well: Cluster State Com / No. 004H
 Location: L.16 26.S 27.E .L. 1887.S 190.W
 Rig Name: Silver Oak #7
 State/County: New Mexico / Eddy
 Latitude: 32.04, Longitude: -104.20
 GRID North is 0.07 Degrees East of True North
 VS-Azi: 0.00 Degrees



Depth Reference : 22'

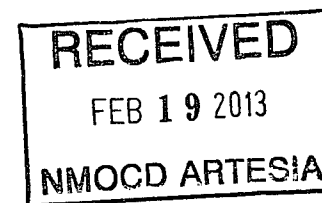
DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...state com 004h gyro survey.ut
 Minimum Curvature Method
 Report Date/Time: 12/3/2012 / 14:09

Vaughn Energy Services
 Fort Worth, Texas
 817-741-3610

Surveyor: Jason Wilson

Cluster State Com No. 004H / API 30-015-40481

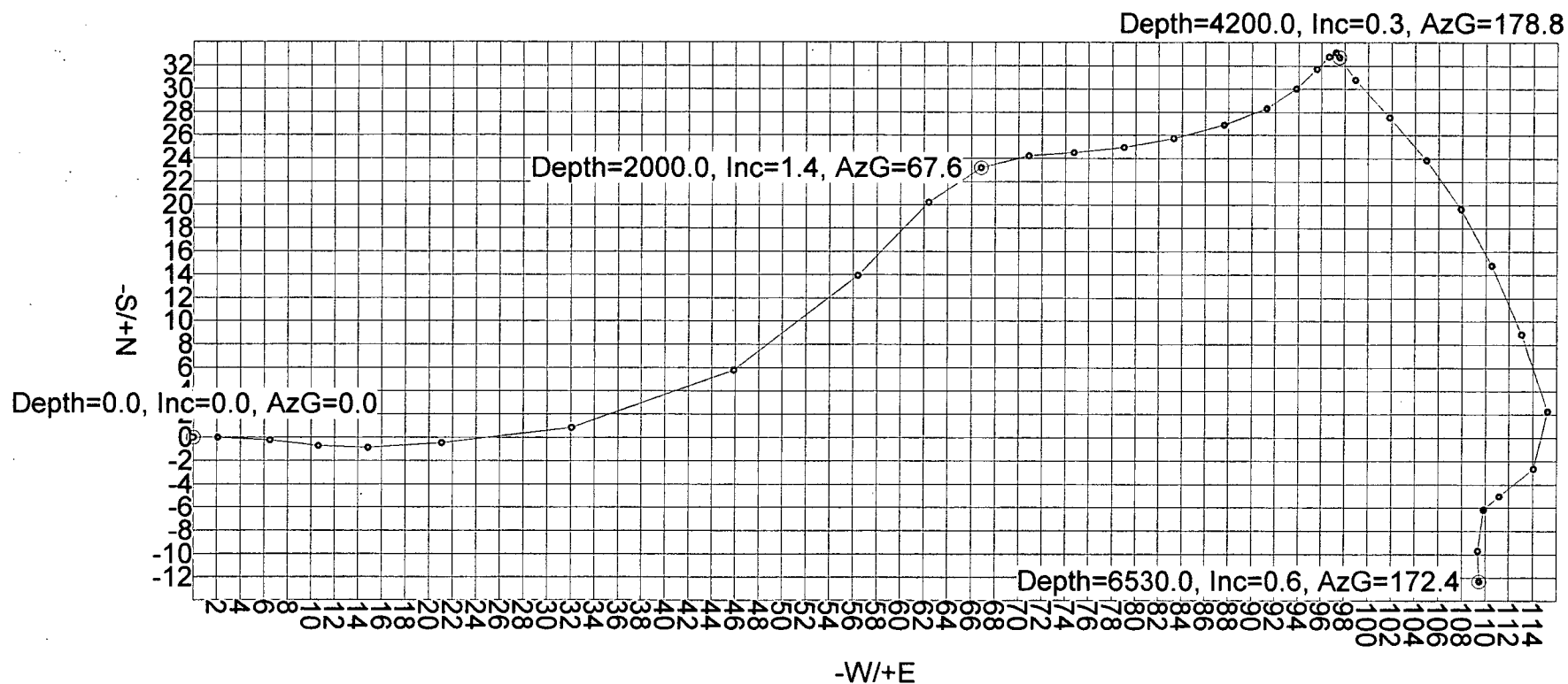


Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
200.00	1.20	90.47	199.99	-0.02	2.09	2.09	90.47	0.60
400.00	1.33	95.16	399.94	-0.24	6.49	6.49	92.14	0.08
600.00	1.05	98.27	599.89	-0.71	10.61	10.63	93.85	0.14
800.00	1.39	87.39	799.85	-0.87	14.85	14.87	93.34	0.21
1000.00	2.19	85.67	999.75	-0.47	21.08	21.08	91.27	0.40
1200.00	4.16	81.80	1199.43	0.85	32.06	32.07	88.47	0.99
1400.00	4.41	59.56	1398.89	5.78	45.86	46.23	82.81	0.83
1600.00	3.31	42.60	1598.44	13.94	56.41	58.10	76.12	0.79
1800.00	1.67	45.83	1798.24	20.22	62.41	65.60	72.05	0.83
2000.00	1.43	67.62	1998.17	23.20	66.81	70.72	70.85	0.31
2200.00	1.01	87.20	2198.12	24.24	70.89	74.92	71.12	0.29
2400.00	1.20	85.22	2398.09	24.50	74.73	78.64	71.85	0.09
2600.00	1.25	82.29	2598.04	24.96	78.97	82.82	72.46	0.04
2800.00	1.27	78.09	2797.99	25.71	83.30	87.17	72.84	0.05
3000.00	1.30	71.74	2997.94	26.88	87.62	91.65	72.94	0.07
3200.00	0.95	63.83	3197.90	28.33	91.27	95.56	72.76	0.19
3400.00	0.82	47.25	3397.88	30.03	93.81	98.50	72.25	0.14
3600.00	0.58	45.56	3597.87	31.72	95.59	100.72	71.64	0.12

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3800.00	0.26	41.09	3797.86	32.78	96.62	102.03	71.26	0.16
4000.00	0.18	84.04	3997.86	33.15	97.23	102.72	71.17	0.09
4200.00	0.26	178.78	4197.86	32.72	97.54	102.89	71.46	0.17
4400.00	1.15	137.18	4397.84	30.79	98.92	103.60	72.71	0.48
4600.00	1.35	138.79	4597.79	27.54	101.83	105.49	74.86	0.10
4800.00	1.41	140.44	4797.74	23.87	104.96	107.64	77.19	0.03
5000.00	1.53	149.53	4997.67	19.67	107.88	109.66	79.67	0.13
5200.00	1.64	153.33	5197.59	14.81	110.52	111.51	82.37	0.08
5400.00	2.05	159.64	5397.49	8.89	113.05	113.40	85.50	0.22
5600.00	1.94	164.03	5597.37	2.28	115.23	115.25	88.86	0.09
5800.00	1.54	231.46	5797.29	-2.65	114.06	114.09	91.33	0.98
6000.00	0.60	229.45	5997.26	-5.00	111.16	111.28	92.58	0.47
6200.00	0.40	226.87	6197.25	-6.16	109.86	110.03	93.21	0.10
6400.00	1.75	179.37	6397.21	-9.69	109.38	109.81	95.06	0.75
6530.00	0.58	172.37	6527.18	-12.32	109.49	110.18	96.42	0.91



Vaughn Energy Services
Fort Worth, Texas
817-741-3610
Surveyor: Jason Wilson
Cluster State Com No. 004H / API 30-015-40481





6429 Cunningham Road

Houston, Texas 77041

Phone: (713) 690-7900 Fax: (713) 466-7979

End of Well Report

Cluster State Com 4H

Eddy County, New Mexico

November 20, 2012 through December 4, 2012

Job Number: CD-12106

Directional Drillers:

Jonathan Martin / Curtis Mai





Summary
Charts
Proposed vs As Drilled
Surveys
Daily Drilling Reports
BHA's
Motor Run Reports
Slide Reports

END OF WELL SUMMARY

Customer: Concho

Well Name: State Cluster Com 4H

Date: 11-20-2012 to 12-4-2012

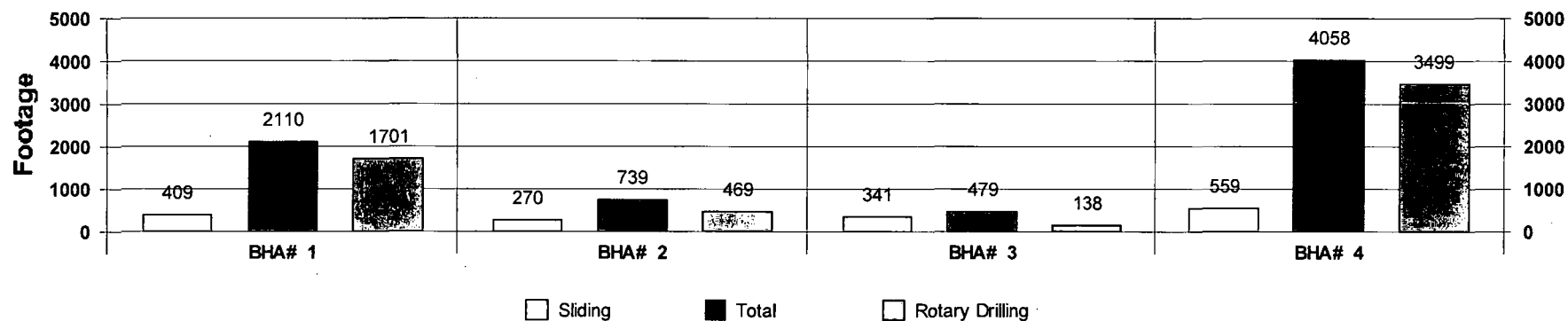
BHA's

To be completed at later date

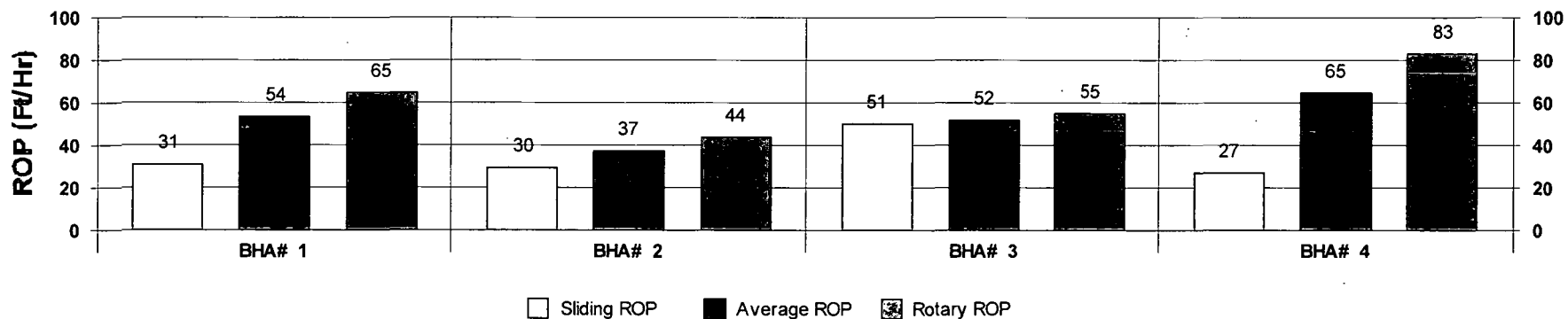


JOB NO.:	CDD-12106	FIELD:	
Company:	COG	Township:	
LOCATION:	Eddy Co	SECT/RANGE:	
RIG NAME:	Silver Oak #7	COMMENT	
STATE:	New Mexico		
COUNTY:	Eddy co		
WELL NAME:	Cluster State Com # 4H		

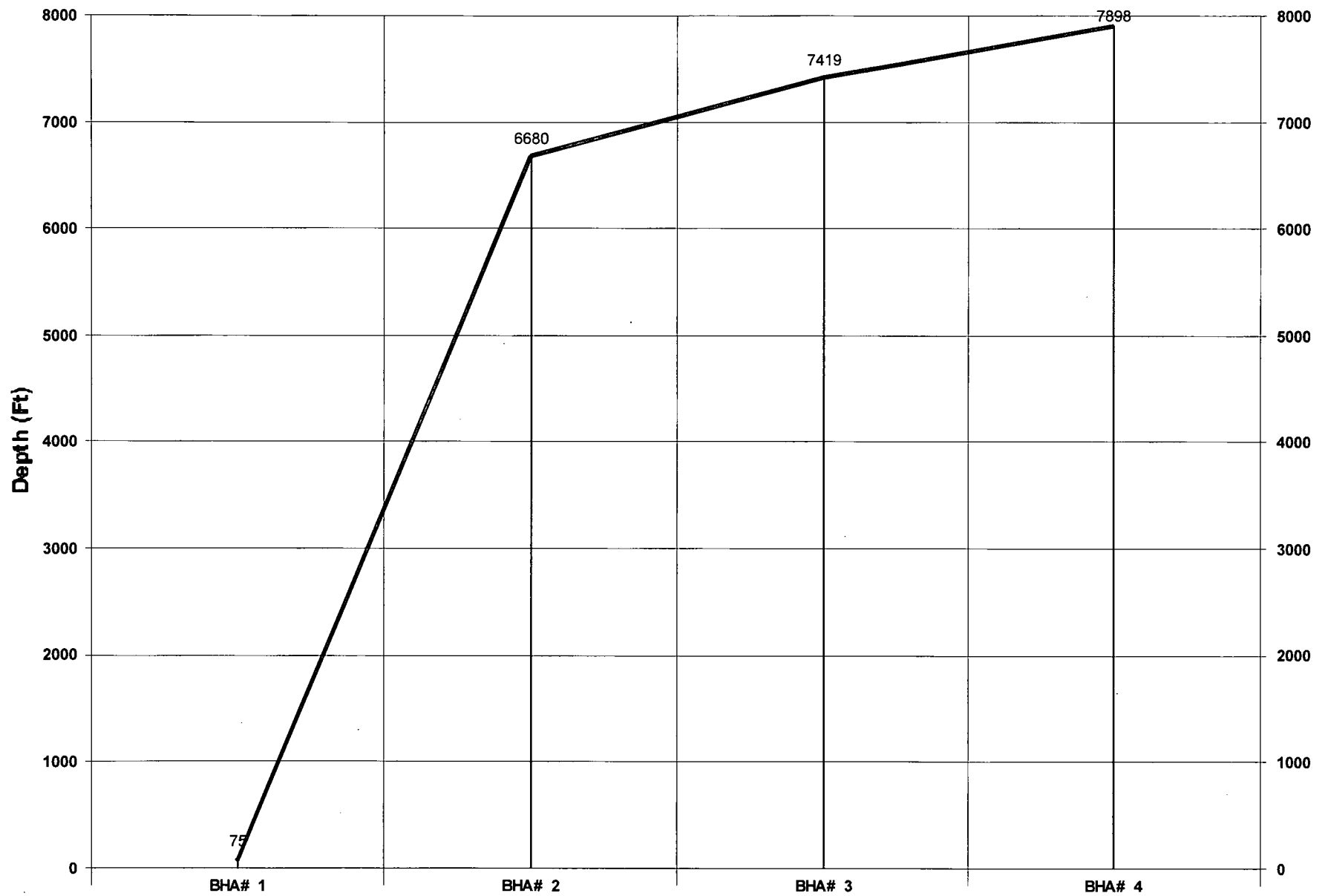
Footage Drilled with BHA



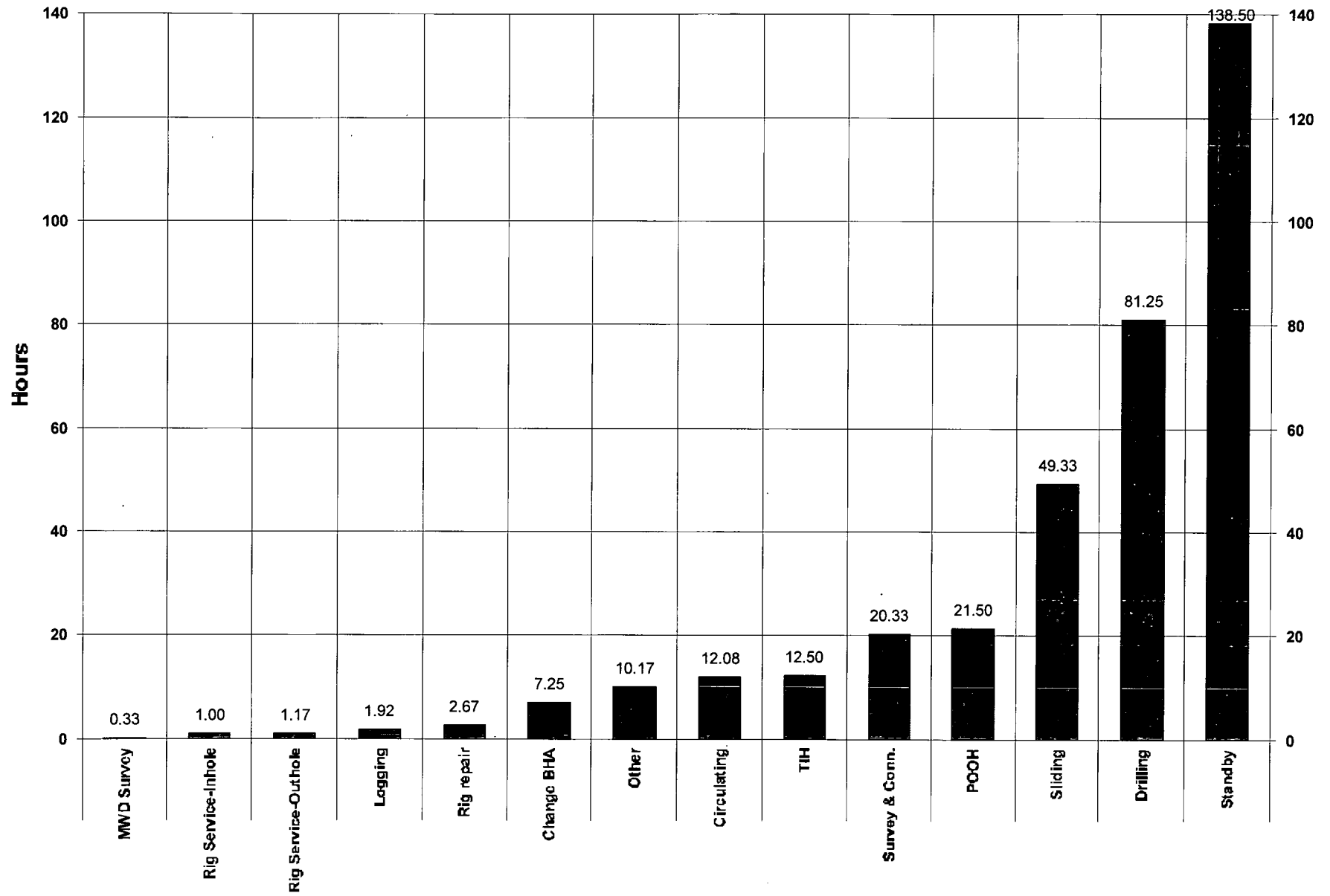
ROP vs BHA



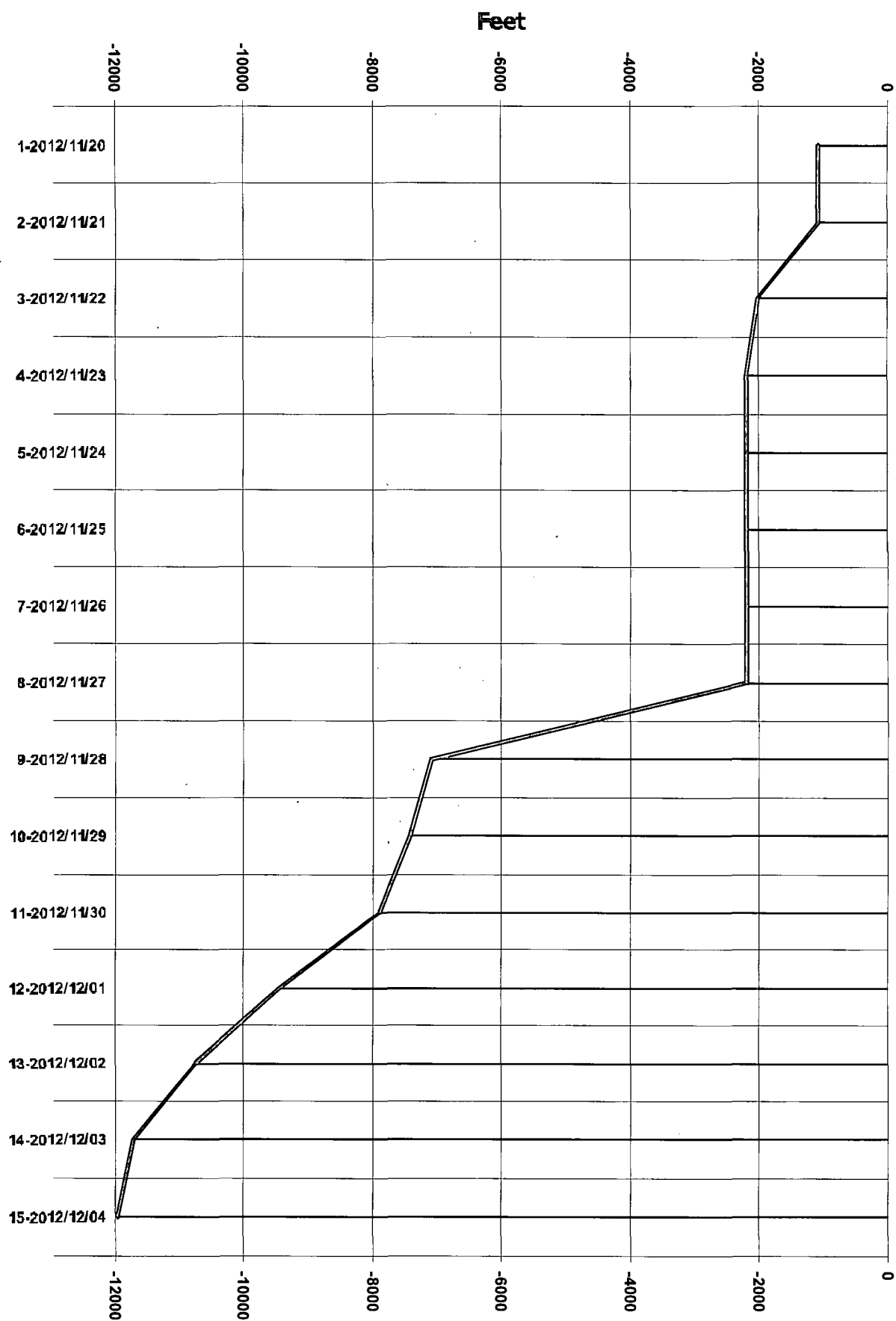
Depth vs BHA



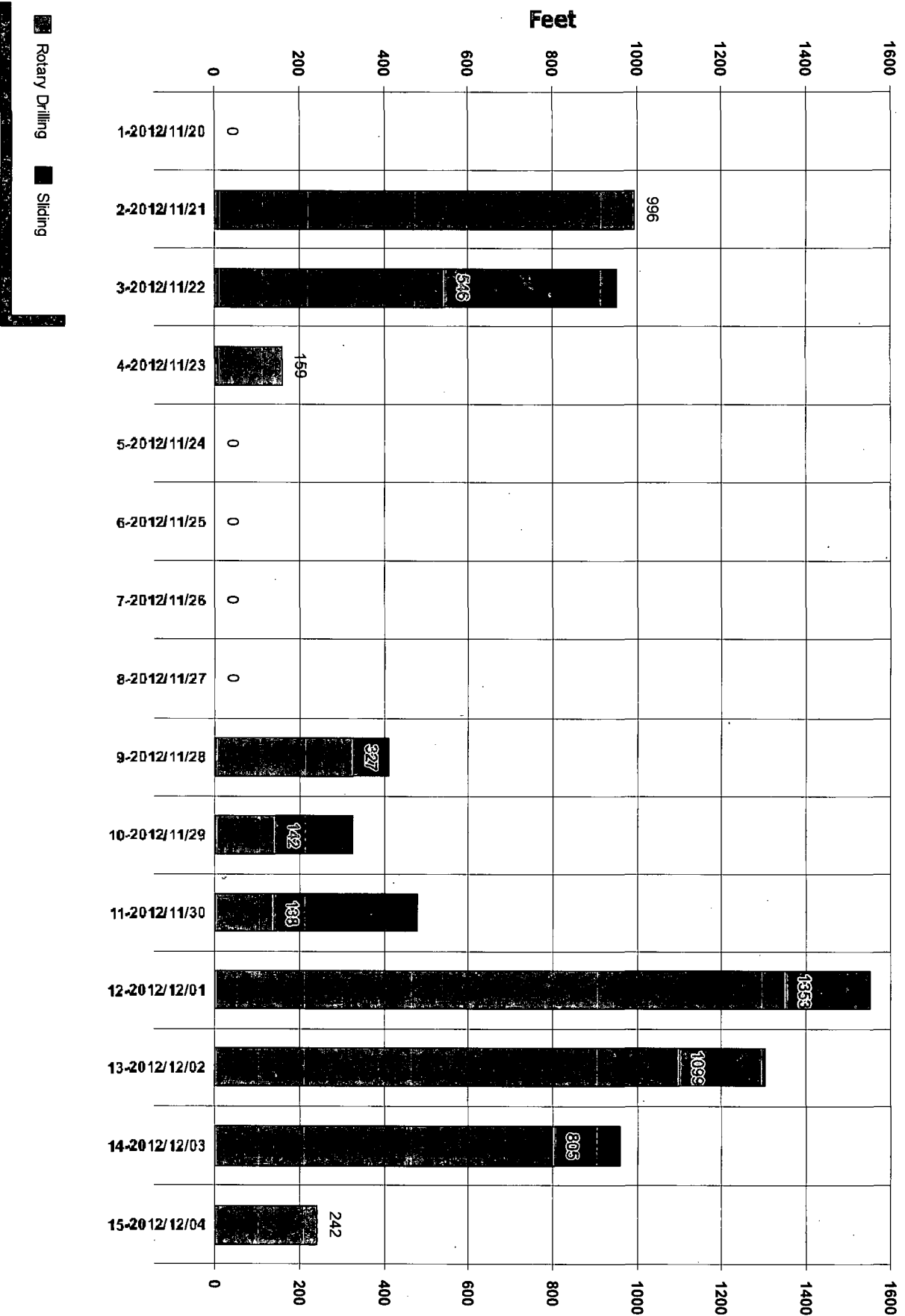
Activity Histogram



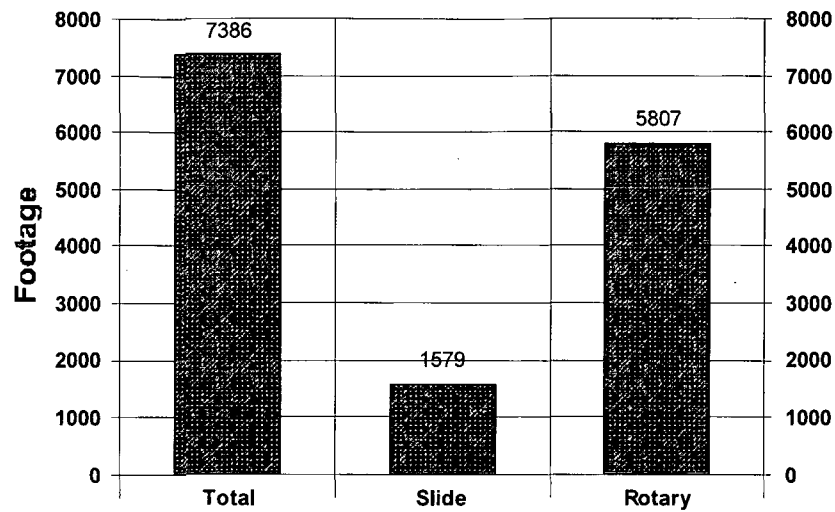
Measured Depth vs Days



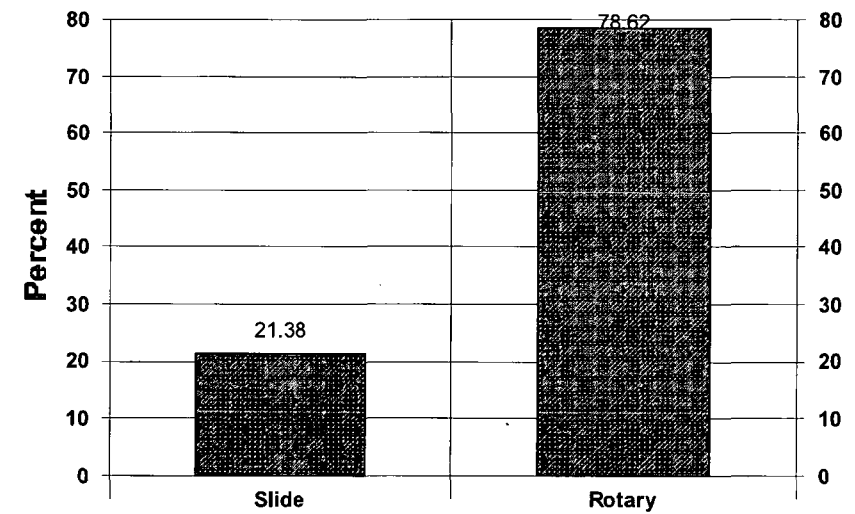
Daily Footage



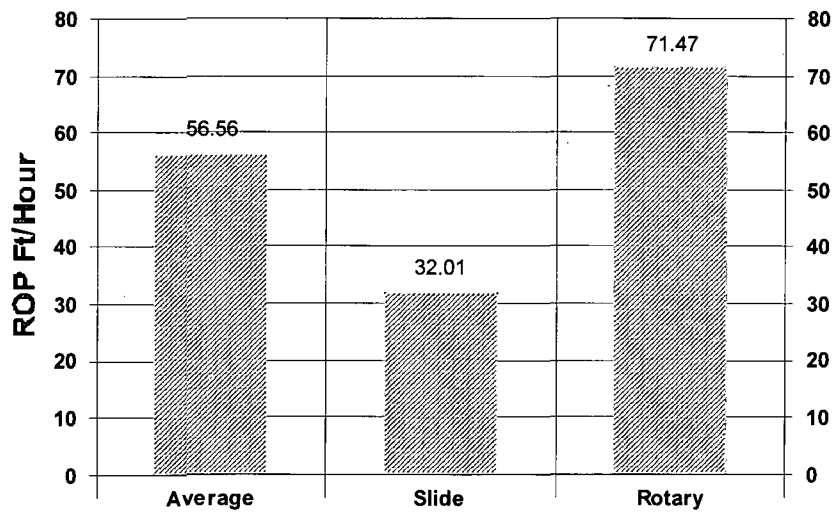
Footage Drilled Totals



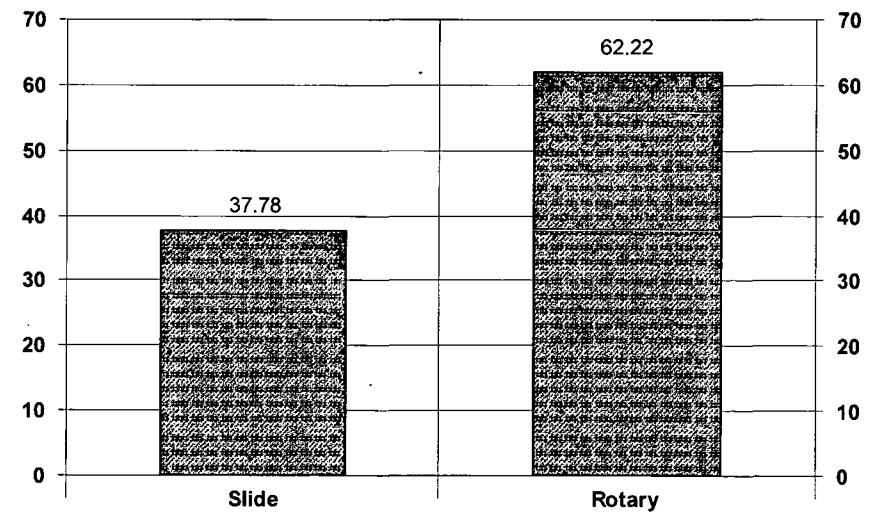
Footage Percent



Rate of Penetration Totals



Time Percent





Company Name: COG Operating, LLC
 Site: Cluster State Com
 4H
 Project: Eddy County, NM (NAD27)
 Rig Name: Silver Oak 7



Created By: Gall Deering
 Date: 7:17, December 04 2012
 Plan: Design #2

ANNOTATIONS

MD	TVD	Inc	Azi	+N/-S	+E/-W	VS	Departure	Annotation
6530.00	6527.18	0.58	172.37	-12.32	109.49	109.63	0.00	VES gyro tie in @ 6530' MD
7076.38	7073.53	0.58	172.37	-17.81	110.23	110.43	5.53	Build @ 12.00°/100'
7808.72	7550.00	87.96	90.40	-25.63	570.87	570.93	466.19	Lateral Hold @ 87.96° INC, 90.40° AZM
12026.32	7700.00	87.96	90.40	-55.00	4785.50	4785.82	4681.13	PBHL

WELL DETAILS 4H

Ground Level:	3294.00
Northing	Easting
378360.00	540526.00

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL	7700.00	-55.00	4785.50	378305.00	545311.50

CASING DETAILS

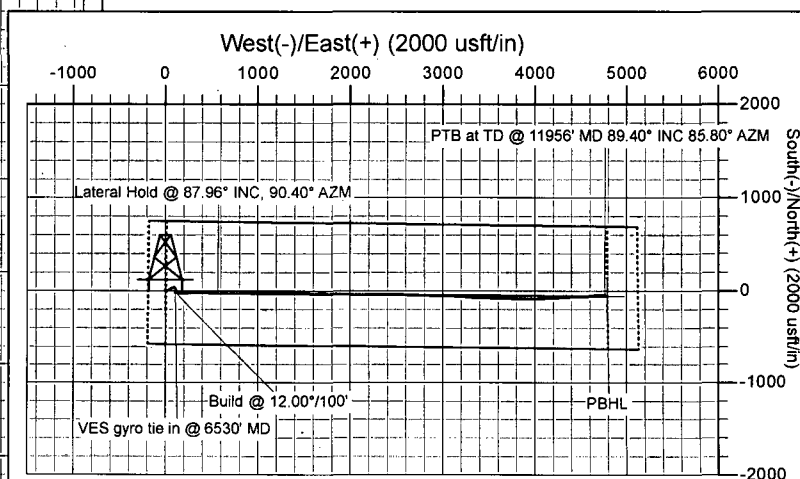
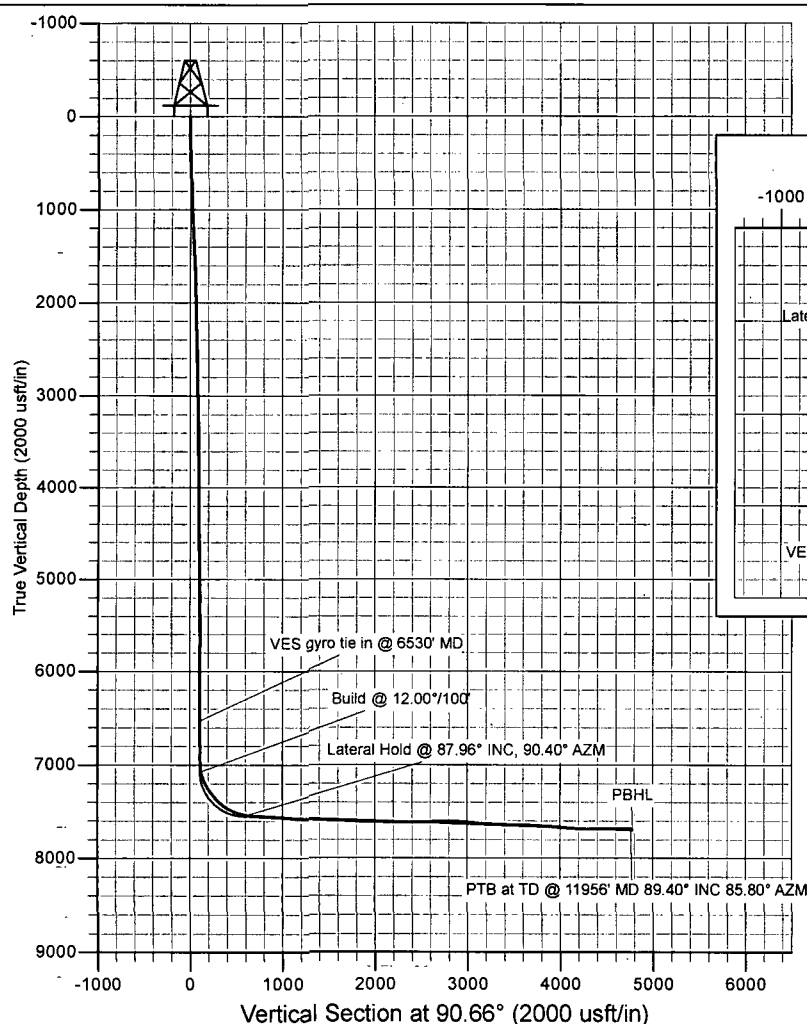
No casing data is available



Azimuths to Grid North
 True North: -0.07°
 Magnetic North: 7.62°

Magnetic Field
 Strength: 46293.9nT
 Dip Angle: 59.87°
 Date: 11/16/2012
 Model: IGRF2010

**Magnetic Azimuth Apply:
 7.62° to convert to Grid North**



FORMATION TOP DETAILS

No formation data is available



COG Operating, LLC

Eddy County, NM (NAD27)

Cluster State Com

4H

Wellbore #1

Design: Surveys

Standard Survey Report

04 December, 2012





Childress Directional Drilling Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Eddy County, NM (NAD27)	TVD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Site:	Cluster State Com	MD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD27)		
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	Cluster State Com				
Site Position:		Northing:	378,360.00 usft	Latitude:	32° 2' 24.572 N
From:	Map	Easting:	540,526.00 usft	Longitude:	104° 12' 9.162 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.07 °

Well	4H					
Well Position	+N/-S	0.00 usft	Northing:	378,360.00 usft	Latitude:	32° 2' 24.572 N
	+E/-W	0.00 usft	Easting:	540,526.00 usft	Longitude:	104° 12' 9.162 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,294.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/16/12	7.69	59.87	48,294

Design	Surveys				
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	90.66	

Survey Program	Date 12/04/12				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.00	6,530.00	VES gyro (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
6,642.00	11,956.00	Childress MWD (Wellbore #1)	MWD	MWD - CHILDRESS MWD	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	1.20	90.47	199.99	-0.02	2.09	2.09	0.60	0.60	0.00
400.00	1.33	95.16	399.94	-0.24	6.50	6.50	0.08	0.07	2.35
600.00	1.05	98.27	599.89	-0.72	10.63	10.63	0.14	-0.14	1.56
800.00	1.39	87.39	799.85	-0.87	14.86	14.87	0.20	0.17	-5.44
1,000.00	2.19	85.67	999.75	-0.47	21.10	21.10	0.40	0.40	-0.86
1,200.00	4.16	81.80	1,199.43	0.85	32.09	32.08	0.99	0.99	-1.94
1,400.00	4.41	59.56	1,398.89	5.78	45.90	45.83	0.83	0.13	-11.12
1,600.00	3.31	42.60	1,598.44	13.93	56.44	56.27	0.79	-0.55	-8.48
1,800.00	1.67	45.83	1,798.24	20.21	62.43	62.20	0.82	-0.82	1.62



Childress Directional Drilling Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Eddy County, NM (NAD27)	TVD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Site:	Cluster State Com	MD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,000.00	1.43	67.62	1,998.17	23.19	66.83	66.56	0.32	-0.12	10.90
2,200.00	1.01	87.20	2,198.12	24.23	70.90	70.62	0.29	-0.21	9.79
2,400.00	1.20	85.22	2,398.09	24.49	74.75	74.46	0.10	0.10	-0.99
2,600.00	1.25	82.29	2,598.04	24.96	79.00	78.70	0.04	0.03	-1.47
2,800.00	1.27	78.09	2,797.99	25.71	83.33	83.03	0.05	0.01	-2.10
3,000.00	1.30	71.74	2,997.94	26.88	87.65	87.34	0.07	0.02	-3.18
3,200.00	0.95	63.83	3,197.90	28.32	91.29	90.96	0.19	-0.18	-3.96
3,400.00	0.82	47.25	3,397.88	30.02	93.83	93.48	0.14	-0.07	-8.29
3,600.00	0.58	45.56	3,597.87	31.70	95.61	95.23	0.12	-0.12	-0.85
3,800.00	0.26	41.09	3,797.86	32.75	96.63	96.24	0.16	-0.16	-2.24
4,000.00	0.18	84.04	3,997.86	33.13	97.24	96.85	0.09	-0.04	21.48
4,200.00	0.26	178.78	4,197.86	32.70	97.56	97.18	0.16	0.04	47.37
4,400.00	1.15	137.18	4,397.84	30.78	98.93	98.57	0.49	0.45	-20.80
4,600.00	1.35	138.79	4,597.79	27.53	101.85	101.53	0.10	0.10	0.81
4,800.00	1.41	140.44	4,797.74	23.86	104.97	104.69	0.04	0.03	0.83
5,000.00	1.53	149.53	4,997.67	19.67	107.89	107.66	0.13	0.06	4.55
5,200.00	1.64	153.33	5,197.59	14.81	110.53	110.35	0.08	0.06	1.90
5,400.00	2.05	159.64	5,397.49	8.90	113.06	112.95	0.23	0.21	3.16
5,600.00	1.94	164.03	5,597.37	2.29	115.23	115.20	0.09	-0.06	2.20
5,800.00	1.54	231.46	5,797.29	-2.64	114.06	114.09	0.98	-0.20	33.72
6,000.00	0.60	229.45	5,997.26	-5.00	111.17	111.22	0.47	-0.47	-1.01
6,200.00	0.40	226.87	6,197.25	-6.15	109.86	109.92	0.10	-0.10	-1.29
6,400.00	1.75	179.37	6,397.21	-9.69	109.38	109.49	0.75	0.68	-23.75
6,530.00	0.58	172.37	6,527.18	-12.32	109.49	109.63	0.90	-0.90	-5.38
6,642.00	1.00	159.40	6,639.17	-13.80	109.91	110.06	0.41	0.38	-11.58
6,738.00	1.40	145.30	6,735.15	-15.55	110.88	111.05	0.51	0.42	-14.69
6,833.00	1.10	144.80	6,830.13	-17.25	112.06	112.25	0.32	-0.32	-0.53
6,928.00	1.80	161.00	6,925.10	-19.40	113.07	113.29	0.85	0.74	17.05
7,024.00	3.20	114.90	7,021.01	-21.96	115.99	116.24	2.44	1.46	-48.02
7,055.00	7.50	100.50	7,051.87	-22.69	118.77	119.02	14.42	13.87	-46.45
7,087.00	13.60	89.80	7,083.32	-23.06	124.59	124.85	19.94	19.06	-33.44
7,119.00	16.90	102.50	7,114.20	-24.05	132.90	133.17	14.62	10.31	39.69
7,151.00	19.10	96.70	7,144.63	-25.67	142.64	142.93	8.86	6.88	-18.13
7,182.00	23.70	93.30	7,173.49	-26.62	153.91	154.20	15.36	14.84	-10.97
7,214.00	27.60	90.70	7,202.33	-27.08	167.74	168.05	12.68	12.19	-8.13
7,246.00	30.70	91.00	7,230.27	-27.32	183.33	183.63	9.70	9.69	0.94
7,278.00	33.30	90.90	7,257.41	-27.60	200.28	200.59	8.13	8.13	-0.31
7,310.00	33.60	90.00	7,284.11	-27.73	217.92	218.22	1.81	0.94	-2.81
7,342.00	36.30	88.70	7,310.33	-27.52	236.25	236.55	8.75	8.44	-4.06
7,373.00	39.00	86.60	7,334.88	-26.73	255.16	255.45	9.64	8.71	-6.77
7,405.00	41.40	85.40	7,359.32	-25.29	275.76	276.04	7.88	7.50	-3.75
7,437.00	44.20	85.20	7,382.79	-23.50	297.43	297.68	8.76	8.75	-0.63
7,469.00	47.70	86.30	7,405.04	-21.81	320.36	320.59	11.21	10.94	3.44



Childress Directional Drilling
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Eddy County, NM (NAD27)	TVD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Site:	Cluster State Com	MD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,501.00	51.70	88.20	7,425.73	-20.65	344.73	344.95	13.29	12.50	5.94
7,533.00	55.90	89.80	7,444.63	-20.21	370.55	370.75	13.73	13.13	5.00
7,565.00	58.70	90.50	7,461.92	-20.28	397.47	397.68	8.94	8.75	2.19
7,597.00	60.90	91.00	7,478.01	-20.64	425.12	425.33	7.01	6.88	1.56
7,628.00	63.70	92.60	7,492.42	-21.51	452.55	452.77	10.12	9.03	5.16
7,660.00	66.50	93.50	7,505.89	-23.06	481.53	481.77	9.11	8.75	2.81
7,692.00	70.50	93.70	7,517.62	-24.93	511.24	511.50	12.51	12.50	0.63
7,724.00	74.10	92.30	7,527.35	-26.52	541.68	541.95	12.00	11.25	-4.38
7,756.00	76.40	92.30	7,535.49	-27.76	572.60	572.88	7.19	7.19	0.00
7,788.00	79.70	90.90	7,542.12	-28.63	603.89	604.18	11.17	10.31	-4.38
7,820.00	84.80	89.80	7,546.43	-28.82	635.58	635.87	16.30	15.94	-3.44
7,851.00	86.40	89.80	7,548.81	-28.72	666.49	666.78	5.16	5.16	0.00
7,883.00	86.40	88.70	7,550.82	-28.30	698.42	698.70	3.43	0.00	-3.44
7,983.00	87.80	90.30	7,555.88	-27.43	798.29	798.55	2.12	1.40	1.60
8,079.00	87.00	90.30	7,560.24	-27.93	894.19	894.45	0.83	-0.83	0.00
8,174.00	85.90	90.30	7,566.12	-28.43	989.00	989.26	1.16	-1.16	0.00
8,270.00	84.60	90.00	7,574.07	-28.68	1,084.67	1,084.93	1.39	-1.35	-0.31
8,365.00	87.50	90.10	7,580.61	-28.76	1,179.43	1,179.69	3.05	3.05	0.11
8,461.00	87.60	90.50	7,584.71	-29.26	1,275.34	1,275.60	0.43	0.10	0.42
8,556.00	86.50	90.10	7,589.60	-29.76	1,370.22	1,370.47	1.23	-1.16	-0.42
8,651.00	86.30	90.50	7,595.57	-30.25	1,465.03	1,465.28	0.47	-0.21	0.42
8,747.00	88.50	90.70	7,599.92	-31.26	1,560.92	1,561.17	2.30	2.29	0.21
8,842.00	88.50	91.60	7,602.41	-33.17	1,655.86	1,656.14	0.95	0.00	0.95
8,938.00	88.00	91.20	7,605.34	-35.51	1,751.79	1,752.08	0.67	-0.52	-0.42
9,033.00	87.30	91.00	7,609.24	-37.33	1,846.69	1,847.00	0.77	-0.74	-0.21
9,128.00	89.90	91.70	7,611.56	-39.57	1,941.63	1,941.96	2.83	2.74	0.74
9,224.00	88.70	91.60	7,612.73	-42.33	2,037.58	2,037.93	1.25	-1.25	-0.10
9,319.00	89.60	90.00	7,614.14	-43.66	2,132.56	2,132.92	1.93	0.95	-1.68
9,415.00	89.20	89.40	7,615.15	-43.16	2,228.55	2,228.90	0.75	-0.42	-0.63
9,511.00	88.60	89.30	7,616.99	-42.07	2,324.52	2,324.85	0.63	-0.63	-0.10
9,607.00	90.00	90.50	7,618.16	-41.90	2,420.51	2,420.83	1.92	1.46	1.25
9,702.00	92.20	91.20	7,616.34	-43.31	2,515.48	2,515.81	2.43	2.32	0.74
9,797.00	92.00	91.00	7,612.86	-45.13	2,610.40	2,610.74	0.30	-0.21	-0.21
9,892.00	91.30	91.00	7,610.12	-46.79	2,705.34	2,705.70	0.74	-0.74	0.00
9,988.00	90.00	91.90	7,609.03	-49.22	2,801.30	2,801.68	1.65	-1.35	0.94
10,083.00	86.40	92.10	7,612.02	-52.53	2,896.18	2,896.60	3.80	-3.79	0.21
10,179.00	84.80	91.60	7,619.38	-55.62	2,991.85	2,992.29	1.75	-1.67	-0.52
10,274.00	84.60	91.60	7,628.16	-58.26	3,086.40	3,086.87	0.21	-0.21	0.00
10,369.00	86.10	93.80	7,635.86	-62.72	3,180.98	3,181.49	2.80	1.58	2.32
10,465.00	87.10	93.80	7,641.55	-69.08	3,276.60	3,277.17	1.04	1.04	0.00
10,559.00	88.50	92.30	7,645.16	-74.07	3,370.39	3,371.02	2.18	1.49	-1.60
10,654.00	89.40	91.90	7,646.90	-77.55	3,465.31	3,465.97	1.04	0.95	-0.42
10,749.00	88.50	92.10	7,648.64	-80.87	3,560.23	3,560.93	0.97	-0.95	0.21



Childress Directional Drilling
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Eddy County, NM (NAD27)	TVD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Site:	Cluster State Com	MD Reference:	WELL @ 3311.50usft (Silver Oak 7)
Well:	4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,844.00	87.70	91.40	7,651.79	-83.77	3,655.13	3,655.86	1.12	-0.84	-0.74
10,940.00	87.20	90.90	7,656.06	-85.69	3,751.02	3,751.76	0.74	-0.52	-0.52
11,036.00	87.00	90.00	7,660.92	-86.45	3,846.89	3,847.63	0.96	-0.21	-0.94
11,131.00	85.80	89.80	7,666.88	-86.28	3,941.70	3,942.44	1.28	-1.26	-0.21
11,226.00	85.80	87.90	7,673.84	-84.38	4,036.42	4,037.13	1.99	0.00	-2.00
11,322.00	85.90	88.00	7,680.79	-80.95	4,132.11	4,132.77	0.15	0.10	0.10
11,417.00	86.30	89.40	7,687.25	-78.80	4,226.86	4,227.49	1.53	0.42	1.47
11,513.00	90.70	87.90	7,689.76	-76.54	4,322.78	4,323.37	4.84	4.58	-1.56
11,608.00	90.60	86.50	7,688.69	-71.90	4,417.66	4,418.19	1.48	-0.11	-1.47
11,704.00	90.20	86.30	7,688.02	-65.87	4,513.46	4,513.92	0.47	-0.42	-0.21
11,800.00	90.10	85.80	7,687.76	-59.26	4,609.24	4,609.61	0.53	-0.10	-0.52
11,895.00	89.40	85.80	7,688.18	-52.30	4,703.98	4,704.27	0.74	-0.74	0.00
11,956.00	89.40	85.80	7,688.82	-47.84	4,764.81	4,765.05	0.00	0.00	0.00
PTB at TD @ 11956' MD 89.40° INC 85.80° AZM									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,956.00	7,688.82	-47.84	4,764.81	PTB at TD @ 11956' MD 89.40° INC 85.80° AZM

Checked By: _____ Approved By: _____ Date: _____



JOB NO.:	CDD-12106	Report Time:	2400	1 of 15
Company:	COG	API JOB #	30-015-40481	
LOCATION:	Eddy Co	WORK ORDER#		
RIG NAME:	Silver Oak #7	FIELD:		
STATE:	New Mexico	Township:		
COUNTY:	Eddy co	SECT/RANGE:		
WELL NAME:	Cluster State Com # 4H			

From Tuesday, November 20, 2012 at 0000 to Tuesday, November 20, 2012 at 2400

Start Depth	0.00	Rotary Hours	0.00	WOB	0	Pick UP	0	Slack Off	0	SPM
End Depth	0.00	Circulating Hours	0.00	RAB	0	SPP	0	FlowRate	0-0	0
Total Drilled:	0.00	Avg. Total ROP:	NA	Mud Data						
Total Rotary Drilled:	0.00	Avg. Rotary ROP:	NA	Type		PV	0	SOLID	0	
Total Drilled Sliding:	0.00	Avg. Slide ROP:	NA	Weight	0	GAS	0	YP	0	BHT°
Slide Hours:	0.00	Percent Rotary:	NA	Viscosity	0	SAND	0	PH	0	Flow T°
Below Rotary Hrs.	0.00	Percent Slide:	NA	Chlorides	0	WL	0		Oil %	0

Lead Directional :	Johnathon Martin	Size	Lb/ft	Set Depth	N/A
Second Directional :					
MWD Operator1	Trea Carter				
MWD Operator2	Cole Shipley				
Directional Company:	Childress				
Geologist:		Signature:			
Company Man:	Corey Bragg/ Ted Laprairie	Daily Cost		\$15,500.00	
Incl. In:	0	Azm. In:	0	Incl. Out:	3.2
		Azm. Out:	114.9	Cummulative Cost:	\$15,500.00

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
20-Nov-12	00:00	24:00	24.00	0	0	Standby	Standby