



NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 27 2016

RECEIVED

30-015-43181

COG Operating LLC

Eddy County, NM (NAD-27 2015)

Beech 25 Federal #12H

API #: 30-015-43181

SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M

PP: 390' FSL, 330' FWL, Sec 25, T17S, R27E, Unit M

BHL: 398' FSL, 1678' FEL, Sec 25, T17S, R27E, Unit O

Design: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O

Standard Survey Report

06 October, 2016





TDS
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Beech 25 Federal #12H
Well: SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M
Wellbore: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O
Design: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O

Local Co-ordinate Reference: Well SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M
TVD Reference: KB @ 3604.00usft (Silver Oak 3)
MD Reference: KB @ 3604.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD-27 2015)		
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	Beech 25 Federal #12H				
Site Position:		Northing:	654,438.40 usft	Latitude:	32° 47' 56.780 N
From:	Map	Easting:	528,820.40 usft	Longitude:	104° 14' 22.345 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.05 °

Well	SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M				
Well Position	+N/-S	0.00 usft	Northing:	654,438.40 usft	Latitude: 32° 47' 56.780 N
	+E/-W	0.00 usft	Easting:	528,820.40 usft	Longitude: 104° 14' 22.345 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level: 3,586.00 usft

Wellbore	BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/9/2016	7.43	60.49	48,320

Design	BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O				
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	91.76	

Survey Program	Date	10/6/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	945.00	VES Gyro #1 (BHL: 402' FSL, 1674' FEL,	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
1,034.00	7,277.00	TDS MWD #2 (BHL: 402' FSL, 1674' FEL,	MWD	MWD - Standard	

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	
100.00	0.47	134.88	100.00	-0.29	0.29	0.30	0.47	0.47	0.00	
200.00	0.53	124.86	200.00	-0.84	0.96	0.99	0.11	0.06	-10.02	
300.00	0.50	146.61	299.99	-1.47	1.58	1.62	0.20	-0.03	21.75	
400.00	0.52	151.17	399.99	-2.23	2.04	2.11	0.05	0.02	4.56	
500.00	0.57	169.08	499.98	-3.12	2.35	2.45	0.18	0.05	17.91	
600.00	0.65	181.96	599.98	-4.17	2.43	2.55	0.16	0.08	12.88	



TDS
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Beech 25 Federal #12H
Well: SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M
Wellbore: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O
Design: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O

Local Co-ordinate Reference: Well SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M
TVD Reference: KB @ 3604.00usft (Silver Oak 3)
MD Reference: KB @ 3604.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
700.00	0.68	190.04	699.97	-5.33	2.30	2.47	0.10	0.03	8.08
800.00	0.30	243.53	799.97	-6.03	1.97	2.15	0.56	-0.38	53.49
900.00	0.30	231.12	899.97	-6.31	1.53	1.72	0.06	0.00	-12.41
945.00	0.31	267.05	944.97	-6.39	1.32	1.51	0.42	0.02	79.84
Tie-In to VES Gyro									
1,034.00	0.20	247.00	1,033.96	-6.46	0.93	1.13	0.16	-0.12	-22.53
1,129.00	1.90	243.40	1,128.94	-7.23	-0.63	-0.41	1.79	1.79	-3.79
First TDS MWD Survey									
1,223.00	4.10	256.50	1,222.81	-8.71	-5.29	-5.02	2.44	2.34	13.94
1,318.00	6.70	259.60	1,317.38	-10.51	-14.05	-13.72	2.75	2.74	3.26
1,412.00	7.00	258.60	1,410.71	-12.63	-25.05	-24.65	0.34	0.32	-1.06
1,507.00	6.70	258.90	1,505.03	-14.84	-36.17	-35.69	0.32	-0.32	0.32
1,601.00	6.50	258.20	1,598.41	-16.98	-46.76	-46.21	0.23	-0.21	-0.74
1,696.00	6.30	256.20	1,692.82	-19.33	-57.08	-56.46	0.32	-0.21	-2.11
1,790.00	6.50	255.70	1,786.23	-21.87	-67.25	-66.54	0.22	0.21	-0.53
1,885.00	6.70	255.80	1,880.60	-24.56	-77.83	-77.04	0.21	0.21	0.11
1,980.00	6.90	246.70	1,974.94	-28.18	-88.44	-87.54	1.15	0.21	-9.58
2,074.00	6.90	245.60	2,068.26	-32.74	-98.77	-97.72	0.14	0.00	-1.17
2,168.00	6.60	245.60	2,161.60	-37.31	-108.83	-107.64	0.32	-0.32	0.00
2,263.00	6.20	245.40	2,256.01	-41.70	-118.47	-117.13	0.42	-0.42	-0.21
2,357.00	7.50	244.90	2,349.34	-46.41	-128.64	-127.15	1.38	1.38	-0.53
2,452.00	7.60	243.40	2,443.52	-51.86	-139.87	-138.21	0.23	0.11	-1.58
2,546.00	7.30	242.00	2,536.72	-57.44	-150.70	-148.87	0.37	-0.32	-1.49
2,641.00	7.00	241.50	2,630.98	-63.04	-161.12	-159.11	0.32	-0.32	-0.53
2,736.00	6.70	241.30	2,725.30	-68.46	-171.07	-168.88	0.32	-0.32	-0.21
2,830.00	6.50	244.40	2,818.68	-73.39	-180.68	-178.34	0.43	-0.21	3.30
2,924.00	6.20	256.90	2,912.11	-76.84	-190.42	-187.97	1.50	-0.32	13.30
3,019.00	4.20	262.30	3,006.71	-78.47	-198.86	-196.36	2.17	-2.11	5.68
3,113.00	2.20	261.60	3,100.56	-79.20	-204.06	-201.53	2.13	-2.13	-0.74
3,207.00	2.20	262.40	3,194.49	-79.70	-207.63	-205.09	0.03	0.00	0.85
3,239.00	2.30	261.30	3,226.47	-79.88	-208.88	-206.32	0.34	0.31	-3.44
3,270.00	1.60	260.00	3,257.45	-80.05	-209.92	-207.36	2.26	-2.26	-4.19
3,302.00	0.30	129.90	3,289.45	-80.18	-210.29	-207.73	5.65	-4.06	-406.56
3,333.00	2.70	104.80	3,320.43	-80.42	-209.52	-206.96	7.84	7.74	-80.97
3,365.00	5.30	102.20	3,352.35	-80.92	-207.35	-204.77	8.14	8.13	-8.13
3,396.00	8.50	98.40	3,383.13	-81.56	-203.68	-201.08	10.42	10.32	-12.26
3,428.00	12.00	95.60	3,414.61	-82.23	-198.03	-195.41	11.04	10.94	-8.75
3,459.00	15.60	92.30	3,444.71	-82.71	-190.66	-188.03	11.88	11.61	-10.65
3,491.00	18.70	90.60	3,475.28	-82.94	-181.23	-178.59	9.81	9.69	-5.31
3,522.00	22.10	90.10	3,504.34	-83.00	-170.42	-167.79	10.98	10.97	-1.61
3,553.00	25.10	90.80	3,532.74	-83.10	-158.01	-155.39	9.72	9.68	2.26



TDS
Survey Report



Company: COG Operating LLC

Local Co-ordinate Reference: Well SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M

Project: Eddy County, NM (NAD-27 2015)

TVD Reference: KB @ 3604.00usft (Silver Oak 3)

Site: Beech 25 Federal #12H

MD Reference: KB @ 3604.00usft (Silver Oak 3)

Well: SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M

North Reference: Grid

Wellbore: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O

Survey Calculation Method: Minimum Curvature

Design: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O

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)
3,585.00	27.90	92.70	3,561.38	-83.55	-143.75	-141.11	9.14	8.75	5.94
3,616.00	31.00	93.20	3,588.37	-84.34	-128.53	-125.88	10.03	10.00	1.61
3,648.00	34.40	92.80	3,615.29	-85.24	-111.26	-108.59	10.65	10.63	-1.25
3,679.00	37.40	92.20	3,640.40	-86.03	-93.11	-90.42	9.74	9.68	-1.94
3,711.00	40.60	91.90	3,665.26	-86.75	-72.98	-70.29	10.02	10.00	-0.94
3,742.00	42.90	91.80	3,688.39	-87.41	-52.35	-49.64	7.42	7.42	-0.32
3,774.00	43.20	92.00	3,711.78	-88.14	-30.52	-27.80	1.03	0.94	0.63
3,805.00	43.00	92.10	3,734.41	-88.90	-9.35	-6.62	0.68	-0.65	0.32
3,837.00	44.10	91.60	3,757.60	-89.61	12.68	15.43	3.60	3.44	-1.56
3,868.00	44.40	91.40	3,779.81	-90.17	34.31	37.06	1.07	0.97	-0.65
3,900.00	44.10	91.40	3,802.73	-90.72	56.63	59.39	0.94	-0.94	0.00
3,931.00	44.20	90.90	3,824.97	-91.15	78.22	80.98	1.17	0.32	-1.61
3,952.02	45.58	89.50	3,839.87	-91.20	93.05	95.81	8.05	6.54	-6.64
As-Drilled PP									
3,963.00	46.30	88.80	3,847.50	-91.08	100.94	103.69	8.05	6.60	-6.41
3,994.00	49.20	86.60	3,868.34	-90.15	123.86	126.57	10.73	9.35	-7.10
4,020.00	52.00	86.50	3,884.85	-88.94	143.91	146.58	10.77	10.77	-0.38
4,052.00	55.10	86.90	3,903.85	-87.46	169.61	172.22	9.74	9.69	1.25
4,083.00	59.20	87.10	3,920.67	-86.10	195.61	198.16	13.24	13.23	0.65
4,115.00	64.30	86.80	3,935.81	-84.60	223.75	226.24	15.96	15.94	-0.94
4,146.00	69.40	87.50	3,947.99	-83.19	252.21	254.64	16.58	16.45	2.26
4,178.00	74.40	88.70	3,957.93	-82.18	282.60	284.99	16.03	15.63	3.75
4,209.00	79.60	89.90	3,964.90	-81.82	312.79	315.16	17.19	16.77	3.87
4,241.00	84.60	91.10	3,969.30	-82.10	344.48	346.83	16.06	15.63	3.75
4,277.00	88.60	90.50	3,971.43	-82.60	380.40	382.76	11.23	11.11	-1.67
4,340.00	88.70	90.70	3,972.92	-83.26	443.38	445.73	0.35	0.16	0.32
4,435.00	91.10	90.20	3,973.08	-84.00	538.37	540.70	2.58	2.53	-0.53
4,529.00	91.40	90.30	3,971.03	-84.41	632.35	634.64	0.34	0.32	0.11
4,623.00	91.10	90.50	3,968.98	-85.07	726.32	728.59	0.38	-0.32	0.21
4,717.00	90.40	89.90	3,967.75	-85.40	820.31	822.55	0.98	-0.74	-0.64
4,812.00	90.10	89.30	3,967.34	-84.74	915.31	917.48	0.71	-0.32	-0.63
4,906.00	91.60	91.00	3,965.94	-84.98	1,009.29	1,011.42	2.41	1.60	1.81
5,000.00	91.70	91.30	3,963.24	-86.87	1,103.23	1,105.38	0.34	0.11	0.32
5,094.00	91.60	91.70	3,960.53	-89.33	1,197.16	1,199.34	0.44	-0.11	0.43
5,189.00	91.60	91.10	3,957.88	-91.65	1,292.10	1,294.30	0.63	0.00	-0.63
5,283.00	90.30	91.60	3,956.32	-93.86	1,386.05	1,388.28	1.48	-1.38	0.53
5,377.00	90.40	91.70	3,955.74	-96.57	1,480.01	1,482.28	0.15	0.11	0.11
5,471.00	90.20	91.10	3,955.25	-98.86	1,573.98	1,576.28	0.67	-0.21	-0.64
5,566.00	90.00	91.30	3,955.09	-100.85	1,668.96	1,671.27	0.30	-0.21	0.21
5,660.00	90.10	90.90	3,955.00	-102.66	1,762.95	1,765.27	0.44	0.11	-0.43
5,754.00	90.10	90.80	3,954.84	-104.05	1,856.93	1,859.25	0.11	0.00	-0.11



TDS
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Beech 25 Federal #12H
Well: SHL: 481' FSL, 237' FWL, Sec 25, T17S, R27E, Unit M
Wellbore: BHL: 402' FSL, 1674' FEL, Sec 25, T17S, R27E, Unit O
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TVD Reference: KB @ 3604.00usft (Silver Oak 3)
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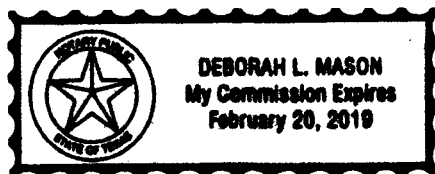
Survey

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)
5,848.00	90.20	89.10	3,954.59	-103.97	1,950.93	1,953.20	1.81	0.11	-1.81
5,943.00	90.10	88.60	3,954.35	-102.06	2,045.91	2,048.08	0.54	-0.11	-0.53
6,037.00	89.90	89.10	3,954.35	-100.18	2,139.89	2,141.96	0.57	-0.21	0.53
6,131.00	89.60	89.00	3,954.76	-98.62	2,233.88	2,235.85	0.34	-0.32	-0.11
6,226.00	89.50	88.70	3,955.50	-96.71	2,328.86	2,330.73	0.33	-0.11	-0.32
6,320.00	89.00	90.30	3,956.73	-95.89	2,422.84	2,424.64	1.78	-0.53	1.70
6,414.00	90.70	91.10	3,956.98	-97.04	2,516.83	2,518.62	2.00	1.81	0.85
6,509.00	90.90	91.40	3,955.65	-99.11	2,611.80	2,613.61	0.38	0.21	0.32
6,603.00	90.70	91.40	3,954.34	-101.41	2,705.76	2,707.60	0.21	-0.21	0.00
6,697.00	90.20	91.70	3,953.60	-103.95	2,799.72	2,801.59	0.62	-0.53	0.32
6,791.00	89.60	89.30	3,953.77	-104.77	2,893.71	2,895.56	2.63	-0.64	-2.55
6,886.00	90.70	90.40	3,953.52	-104.52	2,988.71	2,990.51	1.64	1.16	1.16
6,980.00	90.80	90.40	3,952.29	-105.18	3,082.70	3,084.47	0.11	0.11	0.00
7,074.00	90.50	90.60	3,951.22	-106.00	3,176.69	3,178.44	0.38	-0.32	0.21
7,168.00	90.10	90.70	3,950.73	-107.07	3,270.68	3,272.43	0.44	-0.43	0.11
7,200.00	90.00	90.60	3,950.70	-107.43	3,302.68	3,304.42	0.44	-0.31	-0.31
Last TDS MWD Survey									
7,277.00	90.00	90.60	3,950.70	-108.24	3,379.67	3,381.40	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
945.00	944.97	-6.39	1.32	Tie-In to VES Gyro
1,129.00	1,128.94	-7.23	-0.63	First TDS MWD Survey
3,952.02	3,839.87	-91.20	93.05	As-Drilled PP
7,200.00	3,950.70	-107.43	3,302.68	Last TDS MWD Survey
7,277.00	3,950.70	-108.24	3,379.67	Projection to Bit/TD

Checked By: Deborah L. Mason Approved By: [Signature] Date: 11/2/2016





11/2/16

State of New Mexico
County of Eddy

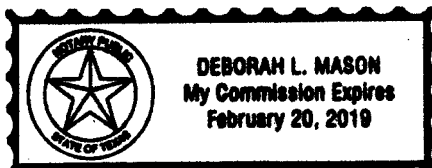
I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 09/30/2016 through 10/05/2016 conduct or supervise the taking of a MWD survey from a depth of 1034 feet to a depth of 7277 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating LLC for the Beech 25 Federal #12H Well API 30-015-43181 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

A handwritten signature of Donald D. Mason in black ink.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.



A handwritten signature of Deborah L. Mason in black ink.

Notary Public's Signature



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

NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 27 2016

RECEIVED

October 10, 2016

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

RE: Beech 25 Federal 12H
481' FSL & 237' FWL
Sec. 25, T17S, R27E
Eddy County, New Mexico

Dear Sir,

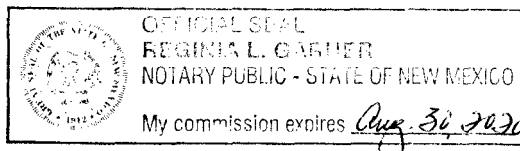
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 10th day of October, 2016.

Notary Public

Beech 25 Federal 12H

Date	Depth	Deviation	Direction
9/27/2016	232	0.60	
9/27/2016	322	0.80	
9/28/2016	425	0.50	
9/29/2016	691	0.80	
9/30/2016	1034	0.20	247.00
9/30/2016	1129	1.90	243.40
9/30/2016	1223	4.10	256.50
9/30/2016	1318	6.70	259.60
9/30/2016	1412	7.00	258.60
9/30/2016	1507	6.70	258.90
9/30/2016	1601	6.50	258.20
9/30/2016	1696	6.30	256.20
9/30/2016	1885	6.70	255.80
9/30/2016	1980	6.90	246.70
9/30/2016	2168	6.60	245.60
9/30/2016	2263	6.20	245.40
10/1/2016	2452	7.60	243.40
10/1/2016	2546	7.30	242.00
10/1/2016	2641	7.00	241.50
10/1/2016	2736	6.70	241.30
10/1/2016	2830	6.50	244.40
10/1/2016	2924	6.20	256.90
10/1/2016	3113	2.20	261.60
10/1/2016	3207	2.20	262.40
10/1/2016	3239	2.30	261.30
10/1/2016	3270	1.60	260.00
10/1/2016	3333	2.70	104.80
10/1/2016	3365	5.30	102.20
10/1/2016	3428	12.00	95.60
10/1/2016	3459	15.60	92.30
10/2/2016	3585	27.90	92.70
10/2/2016	3679	37.40	92.20
10/2/2016	3774	43.20	92.00
10/2/2016	3868	44.40	91.40
10/2/2016	3900	44.10	91.40
10/2/2016	3931	44.20	90.90
10/2/2016	3994	49.20	86.60
10/2/2016	4020	52.00	86.50
10/2/2016	4146	69.40	87.50
10/2/2016	4178	74.40	88.40
10/3/2016	4277	88.60	90.50
10/3/2016	4340	88.70	90.70

Date	Depth	Deviation	Direction
10/3/2016	4435	91.10	90.20
10/3/2016	4529	91.40	90.30
10/3/2016	4623	91.10	90.50
10/3/2016	4717	90.40	89.90
10/3/2016	4812	90.10	89.30
10/3/2016	4906	91.60	91.00
10/3/2016	5000	91.70	91.30
10/3/2016	5283	90.30	91.60
10/4/2016	5471	90.20	91.10
10/4/2016	5566	90.00	91.30
10/4/2016	5660	90.10	90.90
10/4/2016	5754	90.10	90.80
10/4/2016	5878	90.20	89.10
10/4/2016	5943	90.10	88.60
10/4/2016	6037	89.90	89.70
10/4/2016	6131	89.60	89.00
10/4/2016	6226	89.50	88.70
10/4/2016	6320	89.00	90.30
10/4/2016	6414	90.70	91.10
10/4/2016	6509	90.90	91.40
10/4/2016	6603	90.70	91.40
10/5/2016	6791	89.60	89.30
10/5/2016	6886	90.70	90.40
10/5/2016	6980	90.80	90.40
10/5/2016	7074	90.50	90.60
10/5/2016	7168	90.10	90.70



October 4, 2016

NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 27 2016

RECEIVED

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

Attn: Kanicia Castillo

RE: **Beech 25 Federal No. 012H**

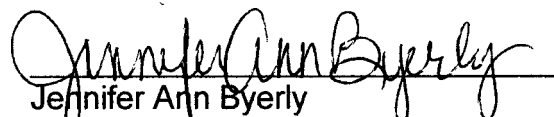
Please find enclosed a copy of the survey from 0' to 945' ran on the above referenced well.

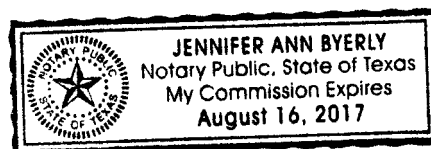
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 4th day of October, A.D., 2016, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: COG OPERATING

Lease/Well: BEECH 25 FEDERAL No./012H

Rig Name: SILVER OAK 3

State/County: NEW MEXICO/EDDY

VS-Azi: 0.00 Degrees

Latitude: 32.79910, Longitude: -104.23954

Grid North = True North -0.05 degs (NAD 27)

Grid Correction Applied = -0.05 degs

VES SURVEY

CONCHO

Depth Reference : RKB 18 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: eline-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/4/2016 / 14:09

VES Survey International

West Texas

432-563-5444

Surveyor: Dustin Byers

Beech 25 Federal No. 012H / API 30-015-43181

WILLIAM OIL CONSERVATION
ARTESIA DISTRICT

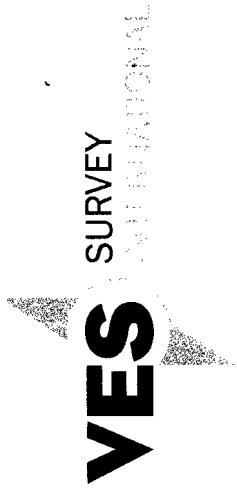
DEC 27 2016

RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.47	134.88	100.00	-0.29	0.29	-0.29	0.41	134.88	0.47
200.00	0.53	124.86	200.00	-0.85	0.96	-0.85	1.28	131.31	0.10
300.00	0.50	146.61	299.99	-1.47	1.58	-1.47	2.16	132.97	0.20
400.00	0.52	151.17	399.99	-2.23	2.04	-2.23	3.02	137.60	0.05
500.00	0.57	169.08	499.98	-3.12	2.35	-3.12	3.91	143.02	0.18
600.00	0.65	181.96	599.98	-4.19	2.43	-4.19	4.84	149.89	0.16
700.00	0.68	190.04	699.97	-5.34	2.31	-5.34	5.82	156.65	0.10
800.00	0.30	243.53	799.97	-6.04	1.97	-6.04	6.35	161.95	0.56
900.00	0.30	231.12	899.97	-6.32	1.53	-6.32	6.51	166.41	0.07
945.00	0.31	267.05	944.96	-6.40	1.31	-6.40	6.54	168.41	0.42



VES Survey International
West Texas
432-563-5444
Surveyor: Dustin Byers
Beech 25 Federal No. 012H / API 30-015-43181



Depth=0.0, Inc=0.0, AzG=0.0

Depth=945.0, Inc=0.3, AzG=267.1

-S/+N

-20

20

-W/+E
VES Survey Date: 9/29/2016



SURVEY

I Dustin Byers certify that I am employed by VES Survey International. That I did on the day(s) of 09/29/16 through 09/29/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 945.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating for the Beech 25 Fed Well # 12H API # 30-015-43181 in Eddy County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by VES Survey International.

A handwritten signature of Dustin Byers in black ink, written over a horizontal line.

Dustin Byers
Service Technician
VES Survey International