



McVAY DRILLING COMPANY
P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

HOBBS OCD

MAR 02 2016

Well Name and Num: West Pearl 36 State Com #4H ✓
Location: Sec 25, T19S, R34E ✓
Operator: COG ✓
Drilling Contractor: McVay Drilling Company

RECEIVED

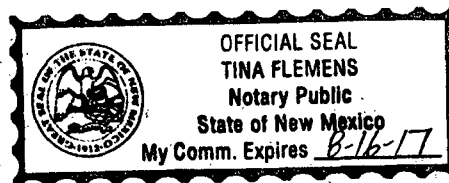
The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.10	467	2.10	6421	90.40	13135		
0.30	819	1.80	6897	89.50	13515		
0.50	1197	1.40	7373	90.20	13988		
0.80	1575	2.00	7850	89.30	14301		
0.10	1765	9.44	8231	89.60	14743		
1.40	1955	10.90	8708	90.60	15027		
1.50	2333	10.60	8994	89.90	15370		
1.90	2522	11.30	9279				
2.50	2900	13.10	9752				
2.70	3278	11.40	10135				
2.40	3593	13.02	10502				
0.40	3964	48.50	10931				
1.00	4437	83.50	11314				
1.25	4815	90.50	11713				
1.50	5288	90.00	12096				
1.50	5760	89.20	12478				
1.60	6043	88.60	12757				

By: Mario D. Bana

Subscribed and sworn to before me this 15th day of October, 2015

Tina Flemens
Notary Public, Lea County, New Mexico



APR 14 2016

dyf



COG Operating, LLC

Lea County, NM

Sec 25, T19S, R34E

West Pearl 36 State Com #4H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

12 October, 2015

HOBBS OGD

MAR 02 2016

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The Directional Drilling Company

11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
Fax: (936) 856-8678



Survey Certification Sheet

Company	Job Number	Date
COG Operating, LLC	WT-150611	9/27/2015

Lease	Well Name	County & State
Sec. 25, T19S, R34E	West Pearl 36 State Com #4H	Lea County, NM

API No.	Survey Depth Range	Survey Type
30-025-42146	106 feet to 15420 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
N/A	Tuffy Hudson

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by The Directional Drilling Company (DDC). This report represents a true and correct directional survey of this well based on the original data obtained at the well site.

Wellbore coordinates are calculated using minimum curvature.

A large, stylized handwritten signature in black ink, which appears to read "Christopher Hughes".

Christopher Hughes

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=DDC, ou,
email=Chrish@directionaldrillers.com, c=US
Date: 2015.10.27 11:56:47 -05'00'

Christopher Hughes
MWD Compliance Manager
The Directional Drilling Company



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well West Pearl 36 State Com #4H
Project:	Lea County, NM	TVD Reference:	well @ 3753.0usft (Mcvay #7)
Site:	Sec 25, T19S, R34E	MD Reference:	well @ 3753.0usft (Mcvay #7)
Well:	West Pearl 36 State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Project: Lea County, NM			
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:		Sec 25, T19S, R34E			
Site Position:		Northing:	591,926.29 usft	Latitude:	32° 37' 28.636 N
From:	Lat/Long	Easting:	752,946.66 usft	Longitude:	103° 30' 42.322 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.44 °

Well:	West Pearl 36 State Com #4H					
Well Position	+N/-S	0.0 usft	Northing:	591,926.29 usft	Latitude:	32° 37' 28.636 N
	+E/-W	0.0 usft	Easting:	752,946.66 usft	Longitude:	103° 30' 42.322 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,736.0 usft

Wellbore						Wellbore #1					
Magnetics		Model Name		Sample Date		Declination		Dip Angle		Field Strength	
						(°)		(°)		(nT)	
		IGRF2015		9/14/2015		7.14		60.46		48,362	

Design		Wellbore #1			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0		177.31

Survey Program		Date	10/12/2015	
From	To			
(usft)	(usft)	Survey (Wellbore)	Tool Name	Description
106.0	15,420.0	MWD (Wellbore #1)	MWD default	MWD - Standard

Survey									
Measured									
Depth	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map		
(usft)	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting	Latitude	Longitude
			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	591,926.29	752,946.66	32° 37' 28.636 N	103° 30' 42.322 W
106.0	0.10	101.40	106.0	0.0	0.1	591,926.27	752,946.75	32° 37' 28.635 N	103° 30' 42.321 W
First MWD Survey @ 106' MD / 106' TVD									
284.0	0.00	194.80	284.0	0.0	0.2	591,926.24	752,946.90	32° 37' 28.635 N	103° 30' 42.319 W
467.0	0.10	206.20	467.0	-0.2	0.2	591,926.10	752,946.83	32° 37' 28.634 N	103° 30' 42.320 W
630.0	0.30	154.90	630.0	-0.7	0.3	591,925.59	752,946.95	32° 37' 28.629 N	103° 30' 42.318 W
819.0	0.30	132.20	819.0	-1.5	0.9	591,924.81	752,947.53	32° 37' 28.621 N	103° 30' 42.312 W
1,009.0	0.30	161.00	1,009.0	-2.3	1.4	591,924.00	752,948.06	32° 37' 28.613 N	103° 30' 42.305 W
1,197.0	0.50	156.80	1,197.0	-3.5	1.9	591,922.78	752,948.54	32° 37' 28.601 N	103° 30' 42.300 W
1,386.0	0.90	136.40	1,386.0	-5.3	3.2	591,920.95	752,949.89	32° 37' 28.582 N	103° 30' 42.284 W
1,575.0	0.80	138.40	1,575.0	-7.4	5.1	591,918.89	752,951.79	32° 37' 28.562 N	103° 30' 42.262 W
1,765.0	1.00	134.30	1,764.9	-9.6	7.2	591,916.74	752,953.86	32° 37' 28.541 N	103° 30' 42.238 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well West Pearl 36 State Com #4H
Project:	Lea County, NM	TVD Reference:	well @ 3753.0usft (Mcvey #7)
Site:	Sec 25, T19S, R34E	MD Reference:	well @ 3753.0usft (Mcvey #7)
Well:	West Pearl 36 State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM/Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,955.0	1.40	137.70	1,954.9	-12.4	9.9	591,913.86	752,956.60	32° 37' 28.512 N	103° 30' 42.206 W
2,144.0	1.60	122.90	2,143.8	-15.6	13.7	591,910.72	752,960.37	32° 37' 28.480 N	103° 30' 42.163 W
2,333.0	1.50	125.20	2,332.8	-18.4	18.0	591,907.86	752,964.61	32° 37' 28.452 N	103° 30' 42.113 W
2,522.0	1.90	121.30	2,521.7	-21.5	22.6	591,904.81	752,969.31	32° 37' 28.421 N	103° 30' 42.059 W
2,711.0	2.30	121.80	2,710.5	-25.1	28.6	591,901.18	752,975.21	32° 37' 28.385 N	103° 30' 41.990 W
2,900.0	2.50	113.80	2,899.4	-28.8	35.5	591,897.52	752,982.20	32° 37' 28.348 N	103° 30' 41.909 W
3,089.0	2.50	110.10	3,088.2	-31.9	43.2	591,894.44	752,989.85	32° 37' 28.317 N	103° 30' 41.820 W
3,278.0	2.70	104.30	3,277.0	-34.4	51.4	591,891.92	752,998.03	32° 37' 28.292 N	103° 30' 41.724 W
3,467.0	2.50	102.20	3,465.8	-36.3	59.7	591,889.95	753,006.37	32° 37' 28.271 N	103° 30' 41.627 W
3,593.0	2.40	107.80	3,591.7	-37.7	64.9	591,888.57	753,011.57	32° 37' 28.257 N	103° 30' 41.566 W
3,775.0	1.20	94.20	3,773.6	-39.0	70.4	591,887.26	753,017.10	32° 37' 28.244 N	103° 30' 41.502 W
3,964.0	0.40	289.20	3,962.6	-39.0	71.8	591,887.33	753,018.45	32° 37' 28.245 N	103° 30' 41.486 W
4,059.0	0.30	293.40	4,057.6	-38.8	71.3	591,887.54	753,017.91	32° 37' 28.247 N	103° 30' 41.492 W
4,153.0	0.20	308.00	4,151.6	-38.6	70.9	591,887.74	753,017.55	32° 37' 28.249 N	103° 30' 41.496 W
4,248.0	1.00	271.60	4,246.6	-38.4	69.9	591,887.87	753,016.60	32° 37' 28.250 N	103° 30' 41.507 W
4,343.0	1.10	263.20	4,341.6	-38.5	68.2	591,887.78	753,014.86	32° 37' 28.249 N	103° 30' 41.528 W
4,437.0	1.00	253.00	4,435.6	-38.9	66.5	591,887.43	753,013.18	32° 37' 28.246 N	103° 30' 41.547 W
4,532.0	1.10	257.40	4,530.5	-39.3	64.8	591,886.99	753,011.50	32° 37' 28.242 N	103° 30' 41.567 W
4,627.0	1.10	252.30	4,625.5	-39.8	63.1	591,886.52	753,009.74	32° 37' 28.237 N	103° 30' 41.588 W
4,721.0	1.50	276.40	4,719.5	-39.9	61.0	591,886.38	753,007.66	32° 37' 28.236 N	103° 30' 41.612 W
4,815.0	1.50	275.80	4,813.5	-39.7	58.6	591,886.64	753,005.21	32° 37' 28.239 N	103° 30' 41.641 W
4,910.0	1.50	279.90	4,908.4	-39.3	56.1	591,886.98	753,002.75	32° 37' 28.242 N	103° 30' 41.669 W
5,004.0	1.60	277.00	5,002.4	-38.9	53.6	591,887.35	753,000.23	32° 37' 28.246 N	103° 30' 41.699 W
5,099.0	1.30	281.10	5,097.4	-38.6	51.2	591,887.72	752,997.86	32° 37' 28.250 N	103° 30' 41.726 W
5,193.0	1.50	270.70	5,191.3	-38.4	48.9	591,887.94	752,995.58	32° 37' 28.252 N	103° 30' 41.753 W
5,288.0	1.50	271.80	5,286.3	-38.3	46.4	591,888.00	752,993.10	32° 37' 28.253 N	103° 30' 41.782 W
5,382.0	1.30	275.10	5,380.3	-38.2	44.1	591,888.13	752,990.81	32° 37' 28.255 N	103° 30' 41.809 W
5,476.0	1.30	272.00	5,474.3	-38.0	42.0	591,888.26	752,988.68	32° 37' 28.256 N	103° 30' 41.834 W
5,571.0	1.20	274.40	5,569.2	-37.9	40.0	591,888.38	752,986.61	32° 37' 28.257 N	103° 30' 41.858 W
5,665.0	1.40	280.40	5,663.2	-37.6	37.8	591,888.66	752,984.50	32° 37' 28.260 N	103° 30' 41.883 W
5,760.0	1.50	287.10	5,758.2	-37.1	35.5	591,889.23	752,982.17	32° 37' 28.266 N	103° 30' 41.910 W
5,854.0	1.50	275.30	5,852.1	-36.6	33.1	591,889.71	752,979.77	32° 37' 28.271 N	103° 30' 41.938 W
5,949.0	1.50	279.70	5,947.1	-36.3	30.6	591,890.03	752,977.30	32° 37' 28.274 N	103° 30' 41.967 W
6,043.0	1.60	277.40	6,041.1	-35.9	28.1	591,890.41	752,974.79	32° 37' 28.278 N	103° 30' 41.996 W
6,138.0	1.60	278.80	6,136.0	-35.5	25.5	591,890.78	752,972.16	32° 37' 28.282 N	103° 30' 42.027 W
6,232.0	1.60	283.20	6,230.0	-35.0	22.9	591,891.28	752,969.59	32° 37' 28.287 N	103° 30' 42.057 W
6,328.0	1.90	276.70	6,326.0	-34.5	20.0	591,891.78	752,966.70	32° 37' 28.293 N	103° 30' 42.090 W
6,421.0	2.10	268.80	6,418.9	-34.4	16.8	591,891.92	752,963.47	32° 37' 28.294 N	103° 30' 42.128 W
6,516.0	2.20	273.00	6,513.8	-34.3	13.2	591,891.98	752,959.91	32° 37' 28.295 N	103° 30' 42.170 W
6,611.0	1.90	275.80	6,608.8	-34.1	9.9	591,892.23	752,956.52	32° 37' 28.298 N	103° 30' 42.209 W
6,706.0	1.90	275.80	6,703.7	-33.7	6.7	591,892.55	752,953.39	32° 37' 28.301 N	103° 30' 42.246 W
6,802.0	1.80	272.30	6,799.7	-33.5	3.6	591,892.77	752,950.30	32° 37' 28.304 N	103° 30' 42.282 W
6,897.0	1.80	271.40	6,894.6	-33.4	0.7	591,892.87	752,947.31	32° 37' 28.305 N	103° 30' 42.317 W
6,992.0	1.80	262.50	6,989.6	-33.6	-2.3	591,892.71	752,944.34	32° 37' 28.303 N	103° 30' 42.352 W
7,087.0	1.80	261.80	7,084.5	-34.0	-5.3	591,892.30	752,941.39	32° 37' 28.300 N	103° 30' 42.386 W
7,183.0	1.50	265.30	7,180.5	-34.3	-8.0	591,891.99	752,938.64	32° 37' 28.297 N	103° 30' 42.418 W
7,278.0	1.70	263.50	7,275.5	-34.6	-10.7	591,891.72	752,936.00	32° 37' 28.294 N	103° 30' 42.449 W
7,373.0	1.40	263.30	7,370.4	-34.9	-13.2	591,891.43	752,933.45	32° 37' 28.292 N	103° 30' 42.479 W
7,468.0	1.50	255.20	7,465.4	-35.3	-15.6	591,890.98	752,931.10	32° 37' 28.287 N	103° 30' 42.507 W
7,564.0	1.30	253.80	7,561.4	-35.9	-17.8	591,890.35	752,928.84	32° 37' 28.281 N	103° 30' 42.533 W
7,659.0	1.30	262.80	7,656.3	-36.4	-19.9	591,889.92	752,926.73	32° 37' 28.277 N	103° 30' 42.558 W
7,755.0	1.10	260.50	7,752.3	-36.7	-21.9	591,889.63	752,924.74	32° 37' 28.274 N	103° 30' 42.581 W
7,850.0	2.00	211.80	7,847.3	-38.2	-23.7	591,888.07	752,922.97	32° 37' 28.259 N	103° 30' 42.602 W
7,945.0	4.40	189.20	7,942.1	-43.2	-25.1	591,883.06	752,921.51	32° 37' 28.210 N	103° 30' 42.620 W
8,040.0	6.80	179.50	8,036.7	-52.5	-25.7	591,873.84	752,920.98	32° 37' 28.119 N	103° 30' 42.627 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well West Pearl 36 State Com #4H
Project:	Lea County, NM	TVD Reference:	well @ 3753.0usft (Mcvay #7)
Site:	Sec 25, T19S, R34E	MD Reference:	well @ 3753.0usft (Mcvay #7)
Well:	West Pearl 36 State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM, Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,136.0	9.80	174.20	8,131.7	-66.3	-24.8	591,860.02	752,921.86	32° 37' 27.982 N	103° 30' 42.618 W
8,231.0	9.40	173.50	8,225.3	-82.0	-23.1	591,844.27	752,923.55	32° 37' 27.826 N	103° 30' 42.599 W
8,326.0	9.60	175.10	8,319.0	-97.6	-21.6	591,828.67	752,925.11	32° 37' 27.671 N	103° 30' 42.582 W
8,422.0	11.10	174.20	8,413.5	-114.8	-19.9	591,811.50	752,926.72	32° 37' 27.501 N	103° 30' 42.565 W
8,517.0	10.20	172.60	8,506.8	-132.2	-17.9	591,794.06	752,928.73	32° 37' 27.329 N	103° 30' 42.543 W
8,612.0	10.20	172.60	8,600.3	-148.9	-15.8	591,777.38	752,930.90	32° 37' 27.163 N	103° 30' 42.519 W
8,708.0	10.90	165.40	8,694.7	-166.1	-12.4	591,760.16	752,934.28	32° 37' 26.993 N	103° 30' 42.481 W
8,803.0	10.40	170.70	8,788.1	-183.3	-8.7	591,743.01	752,937.93	32° 37' 26.823 N	103° 30' 42.440 W
8,898.0	11.50	170.50	8,881.3	-201.1	-5.8	591,725.21	752,940.88	32° 37' 26.646 N	103° 30' 42.407 W
8,994.0	10.60	168.60	8,975.6	-219.2	-2.5	591,707.11	752,944.20	32° 37' 26.467 N	103° 30' 42.370 W
9,088.0	11.70	176.90	9,067.8	-237.2	-0.2	591,689.12	752,946.43	32° 37' 26.289 N	103° 30' 42.346 W
9,149.3	12.27	178.47	9,127.7	-249.9	0.3	591,676.40	752,946.94	32° 37' 26.163 N	103° 30' 42.341 W
Crossed Lease Line @ 9149' MD / 9128' TVD									
9,184.0	12.60	179.30	9,161.6	-257.4	0.4	591,668.93	752,947.08	32° 37' 26.089 N	103° 30' 42.340 W
9,279.0	11.30	180.00	9,254.6	-277.0	0.5	591,649.26	752,947.21	32° 37' 25.894 N	103° 30' 42.340 W
9,371.0	11.20	177.40	9,344.8	-295.0	1.0	591,631.32	752,947.61	32° 37' 25.717 N	103° 30' 42.337 W
9,466.0	11.50	176.50	9,437.9	-313.6	2.0	591,612.65	752,948.61	32° 37' 25.532 N	103° 30' 42.327 W
9,561.0	11.40	179.00	9,531.1	-332.5	2.7	591,593.81	752,949.35	32° 37' 25.346 N	103° 30' 42.320 W
9,656.0	13.00	182.10	9,623.9	-352.5	2.5	591,573.74	752,949.13	32° 37' 25.147 N	103° 30' 42.325 W
9,752.0	13.10	182.80	9,717.4	-374.2	1.5	591,552.09	752,948.20	32° 37' 24.933 N	103° 30' 42.337 W
9,848.0	13.40	178.10	9,810.9	-396.2	1.4	591,530.10	752,948.04	32° 37' 24.715 N	103° 30' 42.341 W
9,943.0	11.30	180.90	9,903.7	-416.5	1.6	591,509.79	752,948.25	32° 37' 24.514 N	103° 30' 42.341 W
10,039.0	11.00	178.30	9,997.9	-435.1	1.7	591,491.23	752,948.38	32° 37' 24.331 N	103° 30' 42.341 W
10,135.0	11.40	167.40	10,092.0	-453.5	4.1	591,472.82	752,950.72	32° 37' 24.148 N	103° 30' 42.315 W
10,231.0	11.80	169.60	10,186.1	-472.4	7.9	591,453.90	752,954.56	32° 37' 23.961 N	103° 30' 42.272 W
10,327.0	10.70	166.00	10,280.2	-490.7	11.8	591,435.60	752,958.49	32° 37' 23.779 N	103° 30' 42.228 W
10,422.0	12.80	170.50	10,373.2	-509.6	15.7	591,416.66	752,962.36	32° 37' 23.592 N	103° 30' 42.184 W
10,502.0	13.20	172.80	10,451.2	-527.4	18.3	591,398.86	752,964.97	32° 37' 23.415 N	103° 30' 42.155 W
10,550.0	15.00	173.30	10,497.7	-539.0	19.7	591,387.25	752,966.38	32° 37' 23.300 N	103° 30' 42.140 W
10,582.0	18.00	175.10	10,528.4	-548.1	20.6	591,378.21	752,967.29	32° 37' 23.211 N	103° 30' 42.130 W
10,614.0	20.80	176.30	10,558.6	-558.7	21.4	591,367.61	752,968.07	32° 37' 23.106 N	103° 30' 42.122 W
10,644.0	23.10	176.70	10,586.4	-569.9	22.1	591,356.42	752,968.76	32° 37' 22.995 N	103° 30' 42.115 W
10,668.0	25.27	175.24	10,608.3	-579.7	22.8	591,346.61	752,969.45	32° 37' 22.898 N	103° 30' 42.107 W
Crossed 330' Hard Line @ 10668' MD / 10608' TVD									
10,676.0	26.00	174.80	10,615.5	-583.1	23.1	591,343.16	752,969.75	32° 37' 22.864 N	103° 30' 42.104 W
10,708.0	28.80	173.50	10,643.9	-597.8	24.6	591,328.52	752,971.26	32° 37' 22.719 N	103° 30' 42.088 W
10,740.0	31.70	173.30	10,671.6	-613.8	26.5	591,312.51	752,973.12	32° 37' 22.560 N	103° 30' 42.068 W
10,772.0	34.80	174.00	10,698.3	-631.2	28.4	591,295.07	752,975.05	32° 37' 22.388 N	103° 30' 42.047 W
10,803.0	38.30	175.40	10,723.2	-649.6	30.1	591,276.69	752,976.75	32° 37' 22.206 N	103° 30' 42.029 W
10,835.0	41.30	177.20	10,747.8	-670.0	31.4	591,256.25	752,978.06	32° 37' 22.003 N	103° 30' 42.015 W
10,867.0	43.50	178.40	10,771.5	-691.6	32.2	591,234.69	752,978.88	32° 37' 21.790 N	103° 30' 42.007 W
10,899.0	45.70	178.10	10,794.2	-714.1	32.9	591,212.24	752,979.57	32° 37' 21.568 N	103° 30' 42.001 W
10,931.0	48.50	177.20	10,816.0	-737.5	33.9	591,188.82	752,980.54	32° 37' 21.336 N	103° 30' 41.992 W
10,963.0	52.10	175.80	10,836.5	-762.0	35.4	591,164.25	752,982.05	32° 37' 21.093 N	103° 30' 41.977 W
10,995.0	55.90	174.80	10,855.3	-787.8	37.5	591,138.45	752,984.17	32° 37' 20.837 N	103° 30' 41.954 W
11,027.0	58.90	174.80	10,872.5	-814.7	40.0	591,111.61	752,986.62	32° 37' 20.571 N	103° 30' 41.928 W
11,059.0	62.00	174.60	10,888.3	-842.4	42.5	591,083.89	752,989.19	32° 37' 20.297 N	103° 30' 41.901 W
11,090.0	65.10	175.60	10,902.1	-870.0	44.9	591,056.24	752,991.55	32° 37' 20.023 N	103° 30' 41.875 W
11,122.0	68.00	176.10	10,914.8	-899.3	47.0	591,026.97	752,993.68	32° 37' 19.733 N	103° 30' 41.853 W
11,154.0	70.30	177.70	10,926.2	-929.2	48.6	590,997.11	752,995.29	32° 37' 19.438 N	103° 30' 41.837 W
11,186.0	72.60	179.00	10,936.4	-959.5	49.5	590,966.79	752,996.16	32° 37' 19.138 N	103° 30' 41.830 W
11,218.0	75.10	179.70	10,945.3	-990.2	49.9	590,936.05	752,996.51	32° 37' 18.834 N	103° 30' 41.828 W
11,250.0	77.80	179.10	10,952.8	-1,021.3	50.2	590,904.95	752,996.84	32° 37' 18.526 N	103° 30' 41.827 W
11,282.0	80.90	177.20	10,958.7	-1,052.8	51.2	590,873.52	752,997.85	32° 37' 18.215 N	103° 30' 41.818 W
11,314.0	83.50	175.40	10,963.0	-1,084.4	53.2	590,841.89	752,999.90	32° 37' 17.902 N	103° 30' 41.797 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well West Pearl 36 State Com #4H
Project:	Lea County, NM	TVD Reference:	well @ 3753.0usft (Mcvay #7)
Site:	Sec 25, T19S, R34E	MD Reference:	well @ 3753.0usft (Mcvay #7)
Well:	West Pearl 36 State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,364.0	85.90	176.00	10,967.7	-1,134.0	57.0	590,792.25	753,003.63	32° 37' 17.410 N	103° 30' 41.758 W
11,427.0	88.70	175.60	10,970.6	-1,196.8	61.6	590,729.49	753,008.24	32° 37' 16.789 N	103° 30' 41.710 W
11,523.0	90.00	174.60	10,971.7	-1,292.4	69.8	590,633.85	753,016.44	32° 37' 15.842 N	103° 30' 41.623 W
11,619.0	90.60	176.10	10,971.2	-1,388.1	77.6	590,538.17	753,024.22	32° 37' 14.895 N	103° 30' 41.540 W
11,713.0	90.50	177.70	10,970.3	-1,482.0	82.6	590,444.32	753,029.31	32° 37' 13.966 N	103° 30' 41.489 W
11,808.0	91.60	177.70	10,968.6	-1,576.9	86.5	590,349.41	753,033.12	32° 37' 13.026 N	103° 30' 41.453 W
11,904.0	90.10	177.70	10,967.1	-1,672.8	90.3	590,253.50	753,036.97	32° 37' 12.077 N	103° 30' 41.417 W
12,000.0	91.00	178.10	10,966.2	-1,768.7	93.8	590,157.57	753,040.49	32° 37' 11.127 N	103° 30' 41.384 W
12,096.0	90.00	178.60	10,965.4	-1,864.7	96.6	590,061.62	753,043.25	32° 37' 10.178 N	103° 30' 41.361 W
12,191.0	91.20	179.10	10,964.4	-1,959.6	98.5	589,966.64	753,045.16	32° 37' 9.238 N	103° 30' 41.347 W
12,287.0	90.50	178.80	10,963.0	-2,055.6	100.3	589,870.67	753,046.92	32° 37' 8.288 N	103° 30' 41.335 W
12,383.0	90.90	177.20	10,961.8	-2,151.6	103.6	589,774.74	753,050.27	32° 37' 7.339 N	103° 30' 41.305 W
12,478.0	89.20	177.40	10,961.7	-2,246.4	108.1	589,679.85	753,054.74	32° 37' 6.399 N	103° 30' 41.261 W
12,566.0	89.30	177.90	10,962.9	-2,334.4	111.7	589,591.93	753,058.35	32° 37' 5.529 N	103° 30' 41.227 W
12,662.0	89.10	177.40	10,964.2	-2,430.3	115.6	589,496.02	753,062.29	32° 37' 4.580 N	103° 30' 41.189 W
12,756.0	88.60	178.40	10,966.1	-2,524.2	119.1	589,402.10	753,065.73	32° 37' 3.650 N	103° 30' 41.158 W
12,852.0	88.90	178.30	10,968.2	-2,620.1	121.8	589,306.17	753,068.49	32° 37' 2.701 N	103° 30' 41.134 W
12,946.0	89.20	177.60	10,969.7	-2,714.1	125.2	589,212.24	753,071.86	32° 37' 1.771 N	103° 30' 41.103 W
13,041.0	89.10	177.40	10,971.2	-2,809.0	129.3	589,117.34	753,076.00	32° 37' 0.832 N	103° 30' 41.063 W
13,135.0	90.40	177.90	10,971.6	-2,902.9	133.2	589,023.42	753,079.85	32° 36' 59.902 N	103° 30' 41.027 W
13,230.0	89.90	178.40	10,971.3	-2,997.8	136.3	588,928.47	753,082.92	32° 36' 58.963 N	103° 30' 41.000 W
13,325.0	89.80	179.80	10,971.6	-3,092.8	137.8	588,833.49	753,084.41	32° 36' 58.023 N	103° 30' 40.991 W
13,420.0	89.80	179.70	10,971.9	-3,187.8	138.2	588,738.49	753,084.83	32° 36' 57.083 N	103° 30' 40.994 W
13,515.0	89.50	181.40	10,972.5	-3,282.8	137.3	588,643.50	753,083.92	32° 36' 56.143 N	103° 30' 41.014 W
13,610.0	88.30	178.80	10,974.3	-3,377.8	137.1	588,548.53	753,083.75	32° 36' 55.203 N	103° 30' 41.024 W
13,705.0	87.80	177.60	10,977.5	-3,472.7	140.1	588,453.63	753,086.73	32° 36' 54.264 N	103° 30' 40.998 W
13,799.0	88.00	178.40	10,981.0	-3,566.5	143.4	588,359.75	753,090.01	32° 36' 53.335 N	103° 30' 40.968 W
13,894.0	89.10	176.10	10,983.4	-3,661.4	147.9	588,264.90	753,094.57	32° 36' 52.396 N	103° 30' 40.923 W
13,988.0	90.20	175.10	10,984.0	-3,755.1	155.1	588,171.18	753,101.78	32° 36' 51.468 N	103° 30' 40.848 W
14,082.0	90.10	177.40	10,983.7	-3,848.9	161.3	588,077.39	753,107.93	32° 36' 50.539 N	103° 30' 40.784 W
14,177.0	90.00	178.60	10,983.6	-3,943.8	164.6	587,982.45	753,111.24	32° 36' 49.600 N	103° 30' 40.754 W
14,221.0	89.80	178.40	10,983.7	-3,987.8	165.7	587,938.46	753,112.39	32° 36' 49.164 N	103° 30' 40.744 W
14,301.0	89.30	176.10	10,984.3	-4,067.7	169.6	587,858.56	753,116.23	32° 36' 48.374 N	103° 30' 40.707 W
14,364.0	88.70	176.90	10,985.4	-4,130.6	173.4	587,795.69	753,120.08	32° 36' 47.751 N	103° 30' 40.668 W
14,459.0	88.60	177.60	10,987.7	-4,225.5	178.0	587,700.83	753,124.63	32° 36' 46.812 N	103° 30' 40.623 W
14,554.0	87.80	177.00	10,990.7	-4,320.3	182.4	587,605.98	753,129.11	32° 36' 45.873 N	103° 30' 40.579 W
14,649.0	88.50	175.80	10,993.7	-4,415.1	188.4	587,511.22	753,135.07	32° 36' 44.935 N	103° 30' 40.518 W
14,743.0	89.60	177.00	10,995.3	-4,508.9	194.3	587,417.42	753,140.97	32° 36' 44.007 N	103° 30' 40.458 W
14,838.0	89.30	175.40	10,996.2	-4,603.7	200.6	587,322.64	753,147.26	32° 36' 43.068 N	103° 30' 40.392 W
14,932.0	89.30	176.70	10,997.3	-4,697.4	207.1	587,228.87	753,153.74	32° 36' 42.140 N	103° 30' 40.325 W
15,027.0	90.60	179.80	10,997.4	-4,792.4	210.0	587,133.93	753,156.64	32° 36' 41.200 N	103° 30' 40.300 W
15,122.0	89.90	177.40	10,997.0	-4,887.3	212.3	587,038.97	753,158.96	32° 36' 40.261 N	103° 30' 40.281 W
15,220.0	89.70	178.10	10,997.4	-4,985.2	216.1	586,941.04	753,162.81	32° 36' 39.291 N	103° 30' 40.245 W
15,370.0	89.90	176.10	10,997.9	-5,135.0	223.7	586,791.24	753,170.40	32° 36' 37.809 N	103° 30' 40.170 W
15,420.0	89.90	176.10	10,998.0	-5,184.9	227.1	586,741.36	753,173.80	32° 36' 37.315 N	103° 30' 40.135 W
TD @ 15420' MD / 10998' TVD									



Survey Report - Geographic



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Project:	Lea County, NM	TVD Reference:	well @ 3753.0usft (Mcvay #7)
Site:	Sec 25, T19S, R34E	MD Reference:	well @ 3753.0usft (Mcvay #7)
Well:	West Pearl 36 State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
106.0	106.0	0.0	0.1	First MWD Survey @ 106' MD / 106' TVD
9,149.3	9,127.7	-249.9	0.3	Crossed Lease Line @ 9149' MD / 9128' TVD
10,668.0	10,608.3	-579.7	22.8	Crossed 330' Hard Line @ 10668' MD / 10608' TVD
15,420.0	10,998.0	-5,184.9	227.1	TD @ 15420' MD / 10998' TVD

Checked By: _____	Approved By: _____	Date: _____
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