

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTOCT 03 2008
OCD-ARTESIAS
FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other						5. Lease Serial No. NMNM100844			
b. Type of Completion ☒ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr. Other _____						6. If Indian, Allottee or Tribe Name			
2. Name of Operator COG OPERATING LLC						7. Unit or CA Agreement Name and No			
Contact: KANICIA CARRILLO E-Mail: kcarrillo@conchioresources.com						8. Lease Name and Well No REINDEER 21 FEDERAL 2			
3. Address 550 WEST TEXAS AVE STE 1300 MIDLAND, TX 79701				3a. Phone No (include area code) Ph. 432-685-4332		9. API Well No. 30-015-35897			
4. Location of Well (Report location clearly and in accordance with Federal requirements)* At surface Lot A 330FNL 330FEL At top prod interval reported below Lot A 330FNL 330FEL At total depth Lot D 422FNL 1015FEL						10. Field and Pool, or Exploratory CROW FLATS ABO			
						11. Sec, T., R, M., or Block and Survey or Area Sec 21 T16S R28E Mer			
						12. County or Parish EDDY			
13. State NM		17. Elevations (DF, KB, RT, GL)* 3599 GL							
14. Date Spudded 04/29/2008		15. Date T.D Reached 06/05/2008		16. Date Completed ☐ D & A ☒ Ready to Prod. 07/09/2008					
18. Total Depth: MD TVD 10336 6577		19. Plug Back T.D.: MD TVD 8662		20. Depth Bridge Plug Set: MD TVD					
21. Type Electric & Other Mechanical Logs Run (Submit copy of each) COMPENSATED NEUTRON CCL				22. Was well cored? ☒ No ☐ Yes (Submit analysis) Was DST run? ☒ No ☐ Yes (Submit analysis) Directional Survey? ☒ No ☐ Yes (Submit analysis)					
23. Casing and Liner Record (Report all strings set in well)									
Hole Size	Size/Grade	Wt (#/ft)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sks & Type of Cement	Slurry Vol (BBL)	Cement Top*	Amount Pulled
17 500	13 375 H40	48 0		505		550		0	158
12 250	9 625 J55	40 0		1806		800		0	257
8.750	7.000 LTC	26 0		6800		660		0	3
6 125	5 500 L80	17 0		10336		1100		0	109
24. Tubing Record									
Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	
25. Producing Intervals					26. Perforation Record				
Formation	Top	Bottom	Perforated Interval		Size	No. Holes	Perf. Status		
A) ABO	6946		6946 TO				OPEN		
B) ABO	7479		7479 TO				OPEN		
C) ABO	7884		7884 TO				OPEN		
D) 8331			8331 TO						
27. Acid, Fracture, Treatment, Cement Squeeze, Etc.									
Depth Interval		Amount and Type of Material							
6946 TO		ACIDIZE W/9,300 GALS ACID FRAC W/91,000 GALS GEL, 60,500# 30/50 OTTAWA SAND							
7479 TO		ACIDIZE W/9,300 GALS ACID FRAC W/91,000 GALS GEL, 60,500# 30/50 OTTAWA SAND							
7884 TO		ACIDIZE W/9,300 GALS ACID FRAC W/91,000 GALS GEL, 60,500# 30/50 OTTAWA SAND							
8331 TO		ACIDIZE W/9,300 GALS ACID FRAC W/91,000 GALS GEL, 60,500# 30/50 OTTAWA SAND							
28. Production - Interval A									
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
07/09/2008	07/19/2008	24	→	269 0	303 0	229 0	42 4		FLows FROM WELL
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
26/64	225		→				1126	POW	
28a. Production - Interval B									
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

(See Instructions and spaces for additional data on reverse side)

ELECTRONIC SUBMISSION #63501 VERIFIED BY THE BLM WELL INFORMATION SYSTEM

** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED **

28b Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

29. Disposition of Gas(Sold, used for fuel, vented, etc.)
SOLD

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top Meas Depth
YATES	597			T/WOLFCAMP	6665
QUEEN	1096				
SAN ANDRES	1910				
GLORIETA	3352				
TUBB	4642				
ABO SHALE	5390				
ABO CARB	5840				
T/LO. ABO	6543				

32. Additional remarks (include plugging procedure):
Logs will be mailed.

33. Circle enclosed attachments:

- | | | | |
|---|--------------------|---------------|-----------------------|
| 1. Electrical/Mechanical Logs (1 full set req'd.) | 2. Geologic Report | 3. DST Report | 4. Directional Survey |
| 5. Sundry Notice for plugging and cement verification | 6. Core Analysis | 7. Other: | |

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions).

Electronic Submission #63501 Verified by the BLM Well Information System.
For COG OPERATING LLC, sent to the Carlsbad

Name (please print) KANICIA CARRILLOTitle PREPARER

Signature _____ (Electronic Submission)

Date 10/01/2008

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

**** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ****

DISTRICT I
1825 N. French Dr., Hobbs, NM 88240

DISTRICT II
1301 W Grand Avenue, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised October 12, 2005

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-35897	Pool Code 97691	Pool Name CROW FLATS; Abo
Property Code 36817	Property Name REINDEER "21" FEDERAL	Well Number 2
OGRID No. 229137	Operator Name C.O.G. OPERATING L.L.C.	Elevation 3599'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	21	16 S	28 E		330	NORTH	330	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	21	16 S	28 E		422	NORTH	1015	WEST	EDDY
Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

		OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Phyllis A. Edwards</i> 9-19-08 Signature Date Phyllis A. Edwards Printed Name Regulatory Analyst
BOTTOM HOLE LOCATION LAT-N32°54'51.85" LONG-W104°11'17.95" SPC-N.: 696425.284 E.: 585844.677 (NAD-83)	SURFACE LOCATION LAT-N32°54'52.13" LONG-W104°10'24.45" SPC-N.: 696459.753 E.: 590405.422 (NAD-83)	
SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief AUG 16 2007 Date Surveyed <i>Gary L. Jones</i> Signature & Seal of Professional Surveyor W.O. 16-12385 Certificate No. Gary L. Jones 7977 BASIN SURVEYS		

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, L.L.C.
 REINDEER 21 FEDERAL #2
 EDDY COUNTY, NM
 Rig: PATTERSON #48
 PathFinder Office Supervisor: MARK TRAHAN
 PathFinder Field Engineers: MAGID IBRAHIM
 SEAN O'HAIR

Survey Horiz. Reference: WELLHEAD
 Ref Coordinates: LAT: 32.54.52.1306 N LON: 104.10.24.3709 W
 Reference: NAD83 new mexico east Transverse Mercator
 Ref GRID Coord: X: 590405.4220 Y: 696459.7530
 North Aligned To: GRID NORTH
 Total Magnetic Correction: 8.19° EAST TO GRID
 Vertical Section Plane: 268.93
 Survey Vert. Reference: 3616.50' Kelly Bushing To MSL

Survey Calculations by RX5 V5.11i using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Survey Latitude (deg)	Survey Longitude (deg)	Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
THE FOLLOWING ARE SCIENTIFIC GYRO SURVEYS.												
100.00	0.45	247.18	100.00	0.00	0.37	0.15 S	0.37 W	32.91448031 N	104.17343756 W	0.40@	247.25	0.00
200.00	0.52	239.78	199.99	100.00	1.13	0.53 S	1.12 W	32.91447927 N	104.17344002 W	1.24@	244.50	0.09
300.00	0.79	258.87	299.99	100.00	2.20	0.90 S	2.19 W	32.91447828 N	104.17344351 W	2.36@	247.74	0.34
400.00	0.99	270.56	399.97	100.00	3.75	1.02 S	3.73 W	32.91447794 N	104.17344853 W	3.87@	254.70	0.27
500.00	1.04	261.53	499.96	100.00	5.51	1.15 S	5.49 W	32.91447760 N	104.17345427 W	5.61@	258.22	0.17
600.00	1.14	260.55	599.94	100.00	7.39	1.44 S	7.37 W	32.91447680 N	104.17346039 W	7.51@	258.93	0.10
700.00	1.03	264.68	699.92	100.00	9.27	1.69 S	9.24 W	32.91447613 N	104.17346651 W	9.40@	259.65	0.13
800.00	0.98	261.58	799.91	100.00	11.02	1.90 S	10.99 W	32.91447556 N	104.17347218 W	11.15@	260.20	0.07
900.00	0.94	263.06	899.89	100.00	12.68	2.12 S	12.65 W	32.91447495 N	104.17347759 W	12.82@	260.48	0.05
1000.00	0.87	264.36	999.88	100.00	14.26	2.30 S	14.22 W	32.91447448 N	104.17348271 W	14.40@	260.83	0.07
1100.00	0.99	271.40	1099.87	100.00	15.88	2.35 S	15.83 W	32.91447434 N	104.17348798 W	16.01@	261.56	0.17
1200.00	0.95	270.25	1199.85	100.00	17.57	2.32 S	17.53 W	32.91447441 N	104.17349350 W	17.68@	262.45	0.04
1300.00	0.79	271.80	1299.84	100.00	19.08	2.30 S	19.05 W	32.91447449 N	104.17349845 W	19.18@	263.12	0.16
1400.00	0.77	279.71	1399.83	100.00	20.43	2.16 S	20.40 W	32.91447487 N	104.17350285 W	20.51@	263.94	0.11
1500.00	0.56	295.46	1499.82	100.00	21.53	1.84 S	21.50 W	32.91447576 N	104.17350644 W	21.58@	265.11	0.28
1600.00	0.65	295.18	1599.82	100.00	22.48	1.39 S	22.45 W	32.91447700 N	104.17350955 W	22.50@	266.46	0.09
1700.00	0.72	310.30	1699.81	100.00	23.46	0.74 S	23.45 W	32.91447879 N	104.17351278 W	23.46@	268.19	0.19
1800.00	0.57	310.14	1799.81	100.00	24.30	0.01 S	24.31 W	32.91448079 N	104.17351558 W	24.31@	269.97	0.15
1900.00	0.66	307.28	1899.80	100.00	25.13	0.66 N	25.15 W	32.91448263 N	104.17351831 W	25.15@	271.49	0.09
2000.00	0.70	307.42	1999.79	100.00	26.06	1.38 N	26.09 W	32.91448462 N	104.17352138 W	26.12@	273.02	0.04
2100.00	0.67	318.30	2099.79	100.00	26.92	2.18 N	26.96 W	32.91448684 N	104.17352422 W	27.05@	274.63	0.13
2200.00	0.62	333.85	2199.78	100.00	27.53	3.10 N	27.59 W	32.91448938 N	104.17352626 W	27.76@	276.42	0.18
2300.00	0.69	339.25	2299.77	100.00	27.96	4.15 N	28.04 W	32.91449226 N	104.17352773 W	28.35@	278.43	0.09
2400.00	0.46	349.29	2399.77	100.00	28.23	5.11 N	28.33 W	32.91449490 N	104.17352866 W	28.79@	280.23	0.25
2500.00	0.39	0.47	2499.77	100.00	28.29	5.85 N	28.40 W	32.91449692 N	104.17352889 W	29.00@	281.63	0.11
2600.00	0.28	32.12	2599.76	100.00	28.14	6.39 N	28.27 W	32.91449842 N	104.17352846 W	28.98@	282.74	0.21

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, L.L.C.
REINDEER 21 FEDERAL #2
EDDY COUNTY, NM
RIG:PATTERSON #48

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Survey Latitude (deg)	Survey Longitude (deg)	Closure Dist (ft)	Dir (deg)	DLS (dg/100ft)
2700.00	0.33	34.33	2699.76	100.00	27.84	6.84 N	27.98 W	32.91449964 N	104.17352750 W	28.80@	283.74	0.05
2800.00	0.28	27.43	2799.76	100.00	27.56	7.29 N	27.70 W	32.91450089 N	104.17352661 W	28.65@	284.75	0.06
2900.00	0.24	29.73	2899.76	100.00	27.34	7.69 N	27.49 W	32.91450198 N	104.17352590 W	28.54@	285.63	0.04
3000.00	0.45	61.89	2999.76	100.00	26.88	8.06 N	27.03 W	32.91450299 N	104.17352443 W	28.21@	286.60	0.28
3100.00	0.36	53.14	3099.76	100.00	26.28	8.43 N	26.44 W	32.91450402 N	104.17352248 W	27.75@	287.69	0.11
3200.00	0.30	74.52	3199.75	100.00	25.77	8.69 N	25.93 W	32.91450472 N	104.17352084 W	27.35@	288.53	0.14
3300.00	0.50	54.67	3299.75	100.00	25.15	9.01 N	25.33 W	32.91450561 N	104.17351885 W	26.88@	289.59	0.24
3400.00	0.53	55.09	3399.75	100.00	24.41	9.53 N	24.59 W	32.91450702 N	104.17351646 W	26.37@	291.18	0.03
3500.00	0.01	350.01	3499.75	100.00	24.02	9.80 N	24.21 W	32.91450777 N	104.17351522 W	26.12@	292.04	0.53
3600.00	0.68	115.93	3599.74	100.00	23.50	9.55 N	23.68 W	32.91450708 N	104.17351349 W	25.53@	291.97	0.69
3700.00	0.48	89.59	3699.74	100.00	22.55	9.30 N	22.73 W	32.91450637 N	104.17351039 W	24.56@	292.24	0.33
3800.00	0.54	108.34	3799.73	100.00	21.69	9.15 N	21.86 W	32.91450597 N	104.17350757 W	23.70@	292.71	0.18
3900.00	0.54	99.02	3899.73	100.00	20.78	8.93 N	20.95 W	32.91450536 N	104.17350459 W	22.77@	293.08	0.09
** TIED INTO SCIENTIFIC GYRO SURVEY @ 3920'MD.												
3920.00	0.36	133.50	3919.73	20.00	20.64	8.87 N	20.81 W	32.91450520 N	104.17350414 W	22.62@	293.09	1.59
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.												
4029.00	0.18	119.18	4028.73	109.00	20.25	8.55 N	20.41 W	32.91450432 N	104.17350285 W	22.13@	292.73	0.17
4093.00	0.70	151.54	4092.73	64.00	19.98	8.16 N	20.14 W	32.91450324 N	104.17350195 W	21.73@	292.05	0.87
4156.00	2.20	191.25	4155.71	63.00	20.06	6.63 N	20.19 W	32.91449905 N	104.17350213 W	21.25@	288.19	2.73
4220.00	2.90	202.39	4219.64	64.00	20.97	3.93 N	21.05 W	32.91449162 N	104.17350494 W	21.41@	280.58	1.34
4283.00	3.17	196.67	4282.55	63.00	22.14	0.79 N	22.15 W	32.91448299 N	104.17350856 W	22.17@	272.04	0.64
4347.00	2.73	198.82	4346.47	64.00	23.19	2.35 S	23.15 W	32.91447437 N	104.17351183 W	23.27@	264.21	0.71
4410.00	3.25	203.34	4409.38	63.00	24.44	5.41 S	24.34 W	32.91446597 N	104.17351573 W	24.94@	257.48	0.91
4474.00	3.17	190.39	4473.28	64.00	25.54	8.81 S	25.38 W	32.91445661 N	104.17351913 W	26.87@	250.85	1.14
4538.00	2.46	195.22	4537.21	64.00	26.28	11.88 S	26.06 W	32.91444818 N	104.17352136 W	28.64@	245.49	1.17
4601.00	1.58	184.42	4600.17	63.00	26.74	14.05 S	26.48 W	32.91444222 N	104.17352274 W	29.98@	242.05	1.52
4665.00	0.97	184.18	4664.15	64.00	26.88	15.47 S	26.59 W	32.91443832 N	104.17352310 W	30.76@	239.81	0.95
4729.00	0.44	200.52	4728.15	64.00	27.02	16.24 S	26.72 W	32.91443620 N	104.17352351 W	31.27@	238.70	0.88
4792.00	0.62	200.27	4791.14	63.00	27.23	16.79 S	26.92 W	32.91443470 N	104.17352418 W	31.73@	238.05	0.29
4856.00	0.79	221.12	4855.14	64.00	27.65	17.44 S	27.33 W	32.91443289 N	104.17352552 W	32.42@	237.45	0.48

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, L.L.C.
REINDEER 21 FEDERAL #2
EDDY COUNTY, NM
RIG:PATTERSON #48

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Survey Latitude (deg)	Survey Longitude (deg)	Closure Dist (ft)	Dir (deg)	DLS (dg/100ft)
4920.00	0.70	196.82	4919.13	64.00	28.07	18.15 S	27.73 W	32.91443095 N	104.17352684 W	33.15@	236.80	0.51
4983.00	0.26	177.50	4982.13	63.00	28.18	18.66 S	27.84 W	32.91442955 N	104.17352718 W	33.52@	236.16	0.74
5047.00	0.79	160.68	5046.13	64.00	28.04	19.22 S	27.69 W	32.91442801 N	104.17352669 W	33.71@	235.23	0.85
5110.00	0.62	142.71	5109.12	63.00	27.70	19.91 S	27.34 W	32.91442613 N	104.17352555 W	33.82@	233.94	0.44
5174.00	0.26	138.60	5173.12	64.00	27.40	20.29 S	27.03 W	32.91442507 N	104.17352455 W	33.80@	233.11	0.56
5237.00	0.53	196.31	5236.12	63.00	27.40	20.68 S	27.02 W	32.91442401 N	104.17352451 W	34.02@	232.57	0.71
5301.00	0.62	167.77	5300.12	64.00	27.42	21.30 S	27.03 W	32.91442230 N	104.17352455 W	34.41@	231.76	0.46
5364.00	0.70	129.21	5363.11	63.00	27.06	21.88 S	26.66 W	32.91442071 N	104.17352335 W	34.48@	230.63	0.70
5428.00	0.70	142.71	5427.11	64.00	26.53	22.43 S	26.12 W	32.91441918 N	104.17352159 W	34.43@	229.34	0.26
5491.00	0.62	149.17	5490.10	63.00	26.13	23.03 S	25.71 W	32.91441753 N	104.17352026 W	34.52@	228.14	0.17
5555.00	0.53	154.12	5554.10	64.00	25.84	23.60 S	25.40 W	32.91441598 N	104.17351927 W	34.67@	227.11	0.16
5618.00	0.35	136.35	5617.10	63.00	25.59	24.00 S	25.14 W	32.91441487 N	104.17351842 W	34.76@	226.34	0.35
5681.00	0.26	215.18	5680.10	63.00	25.54	24.25 S	25.09 W	32.91441417 N	104.17351826 W	34.90@	225.97	0.63
5745.00	0.44	209.97	5744.10	64.00	25.75	24.58 S	25.30 W	32.91441326 N	104.17351893 W	35.28@	225.82	0.28
5803.00	0.44	159.36	5802.10	58.00	25.79	24.99 S	25.33 W	32.91441216 N	104.17351904 W	35.58@	225.39	0.65
5866.00	0.26	149.77	5865.09	63.00	25.64	25.34 S	25.17 W	32.91441119 N	104.17351853 W	35.72@	224.82	0.30
5930.00	0.44	148.35	5929.09	64.00	25.45	25.67 S	24.97 W	32.91441027 N	104.17351787 W	35.81@	224.21	0.28
5992.00	0.44	102.69	5991.09	62.00	25.09	25.93 S	24.61 W	32.91440957 N	104.17351671 W	35.75@	223.51	0.55
6056.00	0.53	130.05	6055.09	64.00	24.63	26.17 S	24.15 W	32.91440890 N	104.17351519 W	35.61@	222.70	0.38
6120.00	0.70	114.81	6119.08	64.00	24.06	26.52 S	23.57 W	32.91440792 N	104.17351330 W	35.48@	221.62	0.37
6183.00	0.62	77.67	6182.08	63.00	23.38	26.61 S	22.88 W	32.91440767 N	104.17351108 W	35.10@	220.69	0.68
6214.00	0.79	85.29	6213.08	31.00	23.00	26.56 S	22.51 W	32.91440782 N	104.17350985 W	34.81@	220.28	0.63
6246.00	1.76	252.74	6245.07	32.00	23.25	26.69 S	22.76 W	32.91440747 N	104.17351066 W	35.07@	220.46	7.93
6277.00	7.03	258.20	6275.97	31.00	25.57	27.22 S	25.07 W	32.91440602 N	104.17351820 W	37.00@	222.65	17.03
6309.00	12.75	259.83	6307.48	32.00	30.99	28.24 S	30.47 W	32.91440323 N	104.17353579 W	41.54@	227.17	17.90
6341.00	18.64	259.68	6338.28	32.00	39.53	29.78 S	38.98 W	32.91439903 N	104.17356355 W	49.06@	232.62	18.41
6373.00	24.53	259.58	6368.02	32.00	51.14	31.90 S	50.56 W	32.91439325 N	104.17360128 W	59.78@	237.75	18.41
6405.00	30.34	259.74	6396.41	32.00	65.69	34.55 S	65.06 W	32.91438605 N	104.17364854 W	73.66@	242.03	18.16
6437.00	35.53	262.97	6423.26	32.00	82.93	37.13 S	82.25 W	32.91437903 N	104.17370458 W	90.24@	245.71	17.12

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, L.L.C.
REINDEER 21 FEDERAL #2
EDDY COUNTY, NM
RIG:PATTERSON #48

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft)		Survey Latitude (deg)	Survey Longitude (deg)	Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
6469.00	40.98	265.19	6448.38	32.00	102.66	39.14 S	101.95 W	32.91437356 N	104.17376878 W	109.21@	249.00	17.56
6501.00	46.69	265.96	6471.45	32.00	124.78	40.85 S	124.04 W	32.91436898 N	104.17384077 W	130.59@	251.77	17.92
6533.00	52.58	265.68	6492.17	32.00	149.11	42.63 S	148.34 W	32.91436419 N	104.17391998 W	154.35@	253.97	18.42
6564.62	58.39	265.07	6510.08	31.62	175.11	44.73 S	174.30 W	32.91435851 N	104.17400458 W	179.95@	255.61	18.44
6597.00	64.81	265.16	6525.47	32.38	203.51	47.15 S	202.67 W	32.91435197 N	104.17409702 W	208.08@	256.90	19.83
6629.00	71.40	265.48	6537.40	32.00	233.13	49.57 S	232.24 W	32.91434544 N	104.17419342 W	237.47@	257.95	20.61
6661.00	77.56	266.36	6545.96	32.00	263.90	51.76 S	262.98 W	32.91433955 N	104.17429360 W	268.03@	258.86	19.43
6724.00	89.25	269.63	6553.18	63.00	326.36	53.93 S	325.41 W	32.91433386 N	104.17449704 W	329.85@	260.59	19.26
6788.00	89.10	269.56	6554.10	64.00	390.35	54.38 S	389.40 W	32.91433288 N	104.17470557 W	393.18@	262.05	0.26
6833.00	88.99	269.47	6554.85	45.00	435.34	54.76 S	434.39 W	32.91433202 N	104.17485219 W	437.83@	262.82	0.32
6928.00	88.99	269.84	6556.53	95.00	530.32	55.33 S	529.38 W	32.91433084 N	104.17516171 W	532.26@	264.03	0.39
7024.00	90.31	270.85	6557.11	96.00	626.28	54.75 S	625.37 W	32.91433282 N	104.17547452 W	627.76@	265.00	1.73
7120.00	87.76	268.67	6558.73	96.00	722.25	55.15 S	721.34 W	32.91433212 N	104.17578726 W	723.45@	265.63	3.49
7216.00	88.20	268.08	6562.11	96.00	818.18	57.88 S	817.24 W	32.91432503 N	104.17609978 W	819.29@	265.95	0.77
7311.00	89.34	268.41	6564.15	95.00	913.15	60.78 S	912.18 W	32.91431742 N	104.17640915 W	914.20@	266.19	1.25
7407.00	89.87	268.17	6564.82	96.00	1009.14	63.65 S	1008.13 W	32.91430994 N	104.17672185 W	1010.14@	266.39	0.61
7502.00	89.60	267.89	6565.25	95.00	1104.13	66.91 S	1103.07 W	32.91430135 N	104.17703125 W	1105.10@	266.53	0.41
7598.00	89.87	268.50	6565.70	96.00	1200.12	69.94 S	1199.02 W	32.91429343 N	104.17734394 W	1201.06@	266.66	0.70
7693.00	89.87	267.48	6565.91	95.00	1295.11	73.27 S	1293.96 W	32.91428466 N	104.17765333 W	1296.04@	266.76	1.07
7789.00	88.46	267.42	6567.31	96.00	1391.06	77.54 S	1389.86 W	32.91427331 N	104.17796583 W	1392.02@	266.81	1.47
7885.00	87.93	268.06	6570.34	96.00	1486.99	81.32 S	1485.73 W	32.91426330 N	104.17827828 W	1487.96@	266.87	0.86
7981.00	87.41	269.77	6574.24	96.00	1582.91	83.14 S	1581.63 W	32.91425869 N	104.17859080 W	1583.82@	266.99	1.86
8076.00	88.29	270.09	6577.80	95.00	1677.83	83.26 S	1676.56 W	32.91425876 N	104.17890015 W	1678.63@	267.16	0.98
8172.00	87.67	270.50	6581.19	96.00	1773.74	82.76 S	1772.50 W	32.91426050 N	104.17921278 W	1774.43@	267.33	0.77
8268.00	88.55	270.69	6584.35	96.00	1869.65	81.77 S	1868.44 W	32.91426362 N	104.17952541 W	1870.23@	267.49	0.94
8364.00	89.87	270.99	6585.68	96.00	1965.58	80.36 S	1964.42 W	32.91426788 N	104.17983817 W	1966.07@	267.66	1.41
8460.00	90.31	270.96	6585.53	96.00	2061.52	78.73 S	2060.41 W	32.91427275 N	104.18015095 W	2061.91@	267.81	0.46
8556.00	90.31	270.74	6585.01	96.00	2157.46	77.30 S	2156.40 W	32.91427705 N	104.18046373 W	2157.78@	267.95	0.23
8652.00	90.57	269.84	6584.27	96.00	2253.43	76.82 S	2252.39 W	32.91427877 N	104.18077655 W	2253.70@	268.05	0.98

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, L.L.C.
REINDEER 21 FEDERAL #2
EDDY COUNTY, NM
RIG:PATTERSON #48

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Survey Latitude (deg)	Survey Longitude (deg)	Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
8747.00	90.04	269.90	6583.76	95.00	2348.42	77.03 S	2347.39 W	32.91427855 N	104.18108612 W	2348.65@	268.12	0.56
8843.00	90.75	270.37	6583.10	96.00	2444.39	76.81 S	2443.39 W	32.91427955 N	104.18139894 W	2444.59@	268.20	0.89
8939.00	90.84	270.00	6581.77	96.00	2540.36	76.50 S	2539.38 W	32.91428078 N	104.18171173 W	2540.53@	268.27	0.40
9035.00	91.01	270.27	6580.22	96.00	2636.33	76.27 S	2635.36 W	32.91428178 N	104.18202452 W	2636.47@	268.34	0.33
9131.00	90.04	269.51	6579.34	96.00	2732.31	76.45 S	2731.36 W	32.91428166 N	104.18233733 W	2732.43@	268.40	1.28
9227.00	88.55	268.69	6580.52	96.00	2828.30	77.96 S	2827.33 W	32.91427789 N	104.18265010 W	2828.41@	268.42	1.77
9322.00	87.23	268.17	6584.02	95.00	2923.23	80.56 S	2922.23 W	32.91427111 N	104.18295935 W	2923.34@	268.42	1.49
9418.00	86.79	268.30	6589.03	96.00	3019.09	83.52 S	3018.06 W	32.91426337 N	104.18327162 W	3019.21@	268.41	0.48
9514.00	88.11	269.07	6593.30	96.00	3114.99	85.72 S	3113.93 W	32.91425770 N	104.18358407 W	3115.11@	268.42	1.59
9609.00	90.92	268.10	6594.10	95.00	3209.97	88.06 S	3208.89 W	32.91425162 N	104.18389351 W	3210.10@	268.43	3.13
9705.00	92.15	268.26	6591.53	96.00	3305.93	91.11 S	3304.80 W	32.91424362 N	104.18420608 W	3306.06@	268.42	1.29
9802.00	91.54	268.24	6588.41	97.00	3402.87	94.07 S	3401.71 W	32.91423586 N	104.18452187 W	3403.01@	268.42	0.63
9897.00	91.45	268.85	6585.93	95.00	3497.84	96.48 S	3496.64 W	32.91422960 N	104.18483125 W	3497.98@	268.42	0.65
9993.00	91.19	270.70	6583.72	96.00	3593.80	96.86 S	3592.61 W	32.91422893 N	104.18514398 W	3593.92@	268.46	1.95
10089.00	91.54	271.28	6581.43	96.00	3689.71	95.20 S	3688.57 W	32.91423386 N	104.18545667 W	3689.80@	268.52	0.71
10184.00	91.45	270.75	6578.95	95.00	3784.61	93.52 S	3783.53 W	32.91423885 N	104.18576608 W	3784.68@	268.58	0.57
10249.00	91.28	270.30	6577.40	65.00	3849.57	92.92 S	3848.50 W	32.91424074 N	104.18597782 W	3849.63@	268.62	0.74
STRAIGHT LINE PROJECTION TO BIT @ 10336'MD.												
10336.00	91.28	270.30	6575.46	87.00	3936.52	92.47 S	3935.48 W	32.91424232 N	104.18626125 W	3936.57@	268.65	0.00

** The survey data at tie-in point was furnished by a recognized survey company and entered as submitted. Survey stations above the tie-in point represent recalculated data by PathFinder Energy Services, Inc. and may reflect minor changes due to rounding differences between survey programs. Only survey stations taken by qualified PathFinder personnel are subject to certification.