

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

5. Lease Serial No.

USA NM NM 30351

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.

Carracas 15A 4 H

9. API Well No.

30-039-30846

10. Field and Pool, or Exploratory Area

Basin Fruitland Coal

11. County or Parish, State

Rio Arriba NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

Energen Resources Corporation

3a. Address

2010 Afton Place, Farmington, NM 87401

3b. Phone No. (include area code)

(505) 325-6800

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SHL: (A) Sec.15, T32N, R05W ; 1030'FNL & 580'FEL

BHL: (D) Sec.15, T32N, R05W ; 900'FNL & 110'FWL

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice

TYPE OF ACTION

☐ Acidize☐ Deepen☐ Production (Start/Resume)☐ Water Shut-Off☐ Alter Casing☐ Fracture Treat☐ Reclamation☐ Well Integrity☐ Casing Repair☐ New Construction☐ Recomplete☐ Other☒ Change Plans☐ Plug and Abandon☐ Temporarily Abandon☐ Convert to Injection☐ Plug Back☐ Water Disposal

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the final site is ready for final inspection.)

Energen Resources would like to make the following changes to the Carracas 15A #4H. The changes will be pertaining to the landing point of the 7" int. casing and the bottom hole location (BHL):

- * Change intermediate casing setting measured depth from 4527'(MD) to 4510' MD and cement with 448 sks lead followed by 100 sks tail with 100% excess lead circulate to surface.
- * Change the TD of the well from 8209'MD to 8227'MD and run the 4 1/2" liner to this depth with 425 sks liner top of 4410'MD.
- * Change the bottom hole footage location from 1000'FNL, 110'FWL to 900'FNL, 110'FWL.

Attached is a revised C-102, directional drilling and operations plan.

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Stephen Byers

Title Drilling Engineer

Signature

Date 12/16/2010

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Troy L. Salvors

Title

Petroleum Engineer

Date

12/21/2010

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

FFO

Title 18 U.S.C. Section 1001, and Title 43 U.S.C. Section 1212, makes 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.

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised July 10, 2010

DISTRICT II
1301 W. Grand Avenue, Artesia, N.M. 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410

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

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit one copy to appropriate
District Office

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-039-30846		2 Pool Code		3 Pool Name BASIN FRUITLAND COAL	
4 Property Code 35654		5 Property Name CARRACAS 15A			6 Well Number 4 H
7 OGRID No. 162928		8 Operator Name ENERGEN RESOURCES CORPORATION			9 Elevation 7532'

10 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	15	32N	5W		1030'	NORTH	580'	EAST	RIO ARRIBA

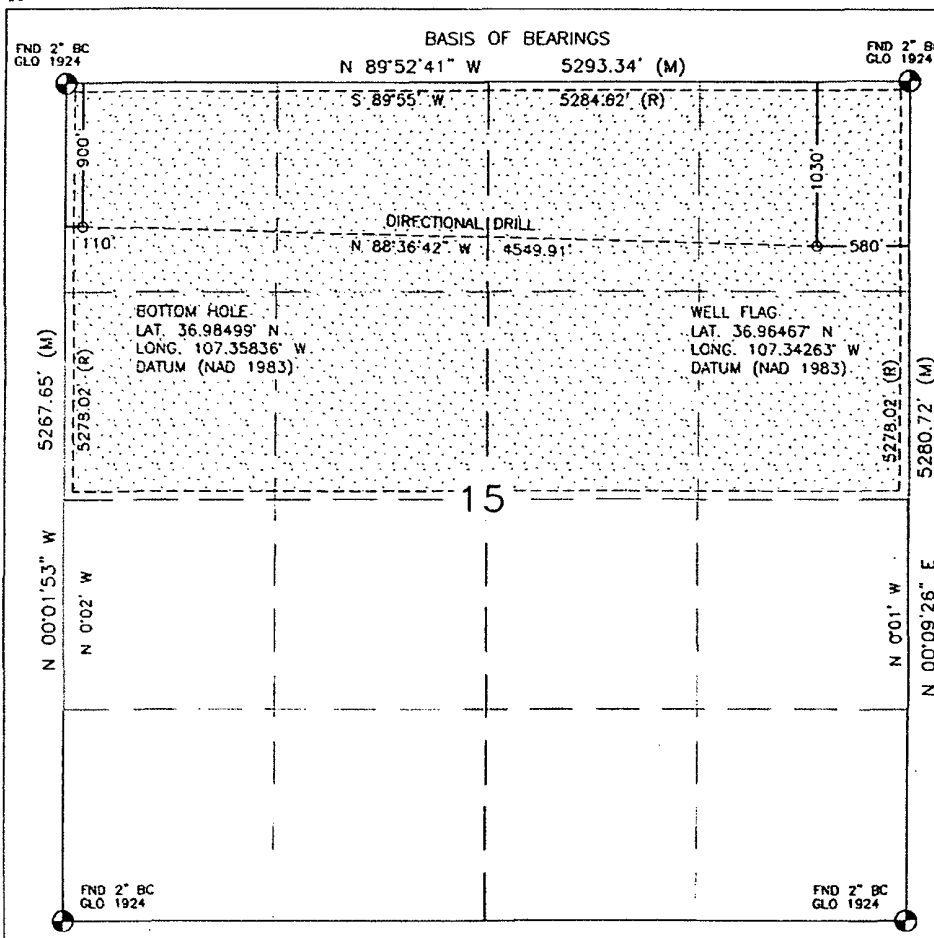
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	15	32N	5W		900'	NORTH	110'	WEST	RIO ARRIBA

12 Dedicated Acres 319.97 ACRES - N/2		13 Joint or Infill		14 Consolidation Code		15 Order No. R-13119	
--	--	--------------------	--	-----------------------	--	-------------------------	--

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

16



17 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 undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this 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.

Stephen Byers 12/16/10
Signature Date

Stephen Byers
Printed Name

shyers@energen.com
E-mail Address

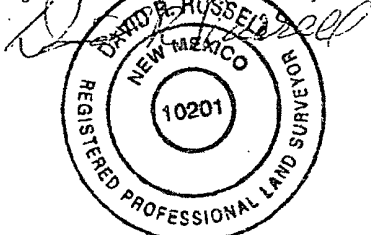
18 SURVEYOR CERTIFICATION

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.

JUNE 23, 2008

Date of Survey

Signature and Seal of Professional Surveyor:



DAVID RUSSELL

Certificate Number

10201



OPERATIONS PLAN

WELL NAME.....Carracas 15A #4H
JOB TYPE.....Horizontal OPE FTC
DEPT.....Drilling and Completions
PREPARED BY.....Stephen Byers

GENERAL INFORMATION

Surface Location	1030 FNL 580 FEL
S-T-R	(A) Sec.15, T32N, R05W
Bottom Hole Location	900 FNL 110 FWL
S-T-R	(D) Sec.15, T32N, R05W
County, State	Rio Arriba, New Mexico
Elevations	7532' GL
Total Depth	8227' +/- (MD); 4007' (TVD)
Formation Objective	Basin Fruitland Coal

FORMATION TOPS

San Jose	Surface
Nacimiento	2060' (TVD)
Ojo Alamo Ss	3309' (TVD)
Kirtland Sh	3439' (TVD)
Fruitland Fm	3920' (TVD) 4115'MD
Top Target Coal	3997' (TVD) 4377'MD
Base Target Coal	4021' (TVD)
Total Depth	4007' (TVD), 8227' (MD)

DRILLING

Surface: 12-1/4" wellbore will be drilled with a fresh water mud system (spud mud).

Intermediate: 8-3/4" wellbore will be drilled with a LSND mud system. Weighting materials will be drill cuttings and if needed barite. Mud density is expected to range from 8.4 ppg to 9.0 ppg.

Production: 6-1/4" wellbore will be drilled with a fresh water or brine water system depending on reservoir characteristics. Anticipated BHP can be as high as 1100 psi.

Projected KOP is 3125' TVD with 6.50°/100' doglegs.

Blowout Control Specifications:

A 3000 psi minimum double ram or annulus BOP stack will be used following nipple up of casing head. A 2" nominal, 2000 psi minimum choke manifold will also be used. An upper Kelly Cock valve handle and drill string valve should be available to fit each drill string and be available on the rig floor during drilling operations. **Pressure test BOP to 250 psi for 15 min and 2000 psi for 15 min.**

Logging Program:

Open hole logs: None

Mudlogs: 3298' TVD, 3300' MD to TD

Surveys: Surface to KOP every 500' and a minimum of every 200' for directional.

CASING, TUBING & CASING EQUIPMENT

String	Start Depth	End Depth	Wellbore	Size	Wt	Grade
Surface	0	200	12-1/4"	9-5/8"	32.3 lb/ft	H-40 ST&C
Intermediate TVD	0 0	4510 4007	8-3/4"	7"	23 lb/ft	J-55 LT&C
Prod. Liner TVD	4410 4005	8227 4009	6-1/4"	4-1/2"	11.6 lb/ft	J-55 LT&C
Tubing	0	4300	none	2-3/8"	4.7 lb/ft	J-55

Surface Casing: Texas Pattern Guide Shoe on bottom of first joint and an insert float valve on top of first joint. Casing centralization with a minimum of 3 standard bow spring centralizers to achieve optimal standoff.

Intermediate Casing: Self fill float shoe with self fill float collar on bottom and top of first joint. Casing centralization with double bow spring and centralizers to optimize standoff.

Production Liner: Bull nose guide shoe on bottom of first joint, H-Latch liner drop off tool on top of last joint.

WELLHEAD

11" 3000 x 9 5/8" weld/slip on casing head. 9 5/8" x 7"x 2 3/8" 3000 psi Flanged Wellhead .

CEMENTING

Surface Casing: 107 sks Type V with 2.0 % CaCl₂ and ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk 126 ft³ of slurry, 100% excess to circulate to surface). WOC 12 hours. Pressure test surface casing to 750 psi for 30 min.

Intermediate Casing: Depending on wellbore conditions, cement may consist of 448 sks PRB II with 5 #/sk Gilsonite, and ¼ #/sk Flocele (12.3 ppg, 2.24 ft³/sk) and a tail of 100 sks PRB II with ¼ #/sk Flocele and 5 #/sk Gilsonite (13.5 ppg, 1.81 ft³/sk). (1185 ft³ of slurry, 100% excess lead to circulate to surface). WOC 12 hours. Test casing to 1500 psi for 30 min.

Production Liner: NO CEMENT, Open Hole Completion

Set slips with full string weight

If cement does not circulate, run temperature survey in 8 hrs. to determine TOC.

OTHER INFORMATION

- 1) This well will be an open hole completion lined with an uncemented pre-drilled liner.
- 2) If lost circulation is encountered, sufficient LCM will be added to the mud system to maintain well control. The intermediate string may need to be cemented in multiple stages with a slurry design deviated from that listed above.
- 3) If high reservoir pressures or water flows are encountered slurry design may need to be deviated to from those listed above to satisfy wellbore and formation conditions.
- 4) No abnormal temperatures or pressures are anticipated.
- 5) This gas is dedicated.



Energen Resources Corp.

Carson National Forest Sec.15-T32N-R05W

Eul Road

Carracas 15A #4H

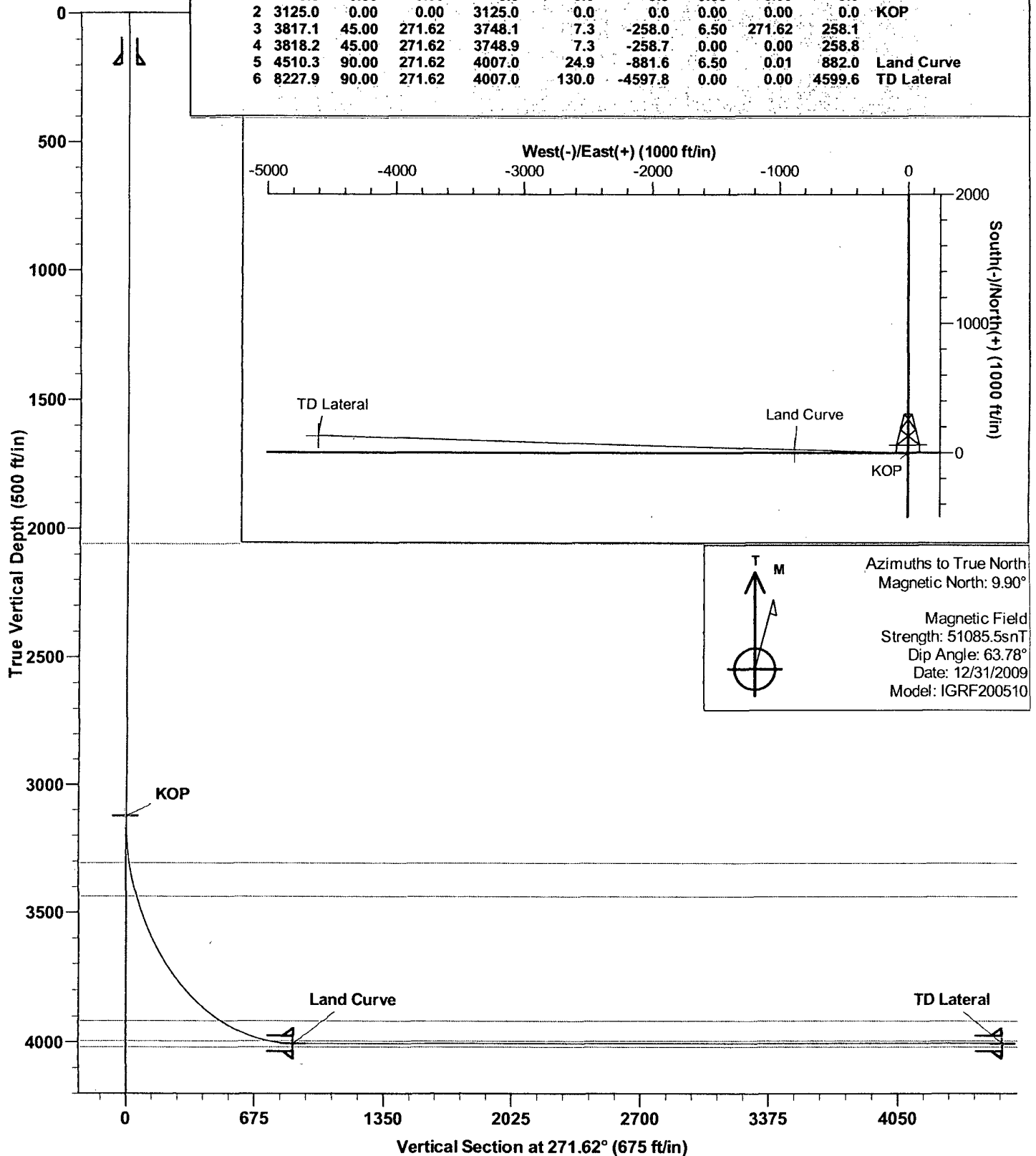
Horizontal OPE FTC

Plan: Plan #2

DIRECTIONAL PLAN

14 December, 2010

Prepared By: Stephen Byers



Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.15-T32N-R05W
Site: Eul Road
Well: Carracas 15A #4H
Wellbore: Horizontal OPE FTC
Design: Plan #2

Local Co-ordinate Reference: Well Carracas 15A #4H
TVD Reference: KB @ 7545.0ft (KB)
MD Reference: KB @ 7545.0ft (KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project	Carson National Forest Sec.15-T32N-R05W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Eul Road		
Site Position:		Northing:	2,172,264.50 ft
From:	Lat/Long	Easting:	1,321,212.19 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	36° 57' 52.812 N
		Longitude:	107° 20' 33.468 W
		Grid Convergence:	-0.66 °

Well	Carracas 15A #4H		
Well Position	+N/-S	0.0 ft	Northing: 2,172,264.50 ft
	+E/-W	0.0 ft	Easting: 1,321,212.19 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	7,532.0 ft
		Latitude:	36° 57' 52.812 N
		Longitude:	107° 20' 33.468 W
		Ground Level:	7,532.0 ft

Wellbore	Horizontal OPE FTC				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.91	63.78	51,086

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	271.62

Survey Tool Program	Date 12/14/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	8,227.9	Plan #2 (Horizontal OPE FTC)	MWD	MWD - Standard

Planned Survey							
MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0
100.0	100.0	0.00	0.00	0.00	0.0	0.0	0.0
200.0	200.0	0.00	0.00	0.00	0.0	0.0	0.0
300.0	300.0	0.00	0.00	0.00	0.0	0.0	0.0
400.0	400.0	0.00	0.00	0.00	0.0	0.0	0.0
500.0	500.0	0.00	0.00	0.00	0.0	0.0	0.0
600.0	600.0	0.00	0.00	0.00	0.0	0.0	0.0
700.0	700.0	0.00	0.00	0.00	0.0	0.0	0.0
800.0	800.0	0.00	0.00	0.00	0.0	0.0	0.0
900.0	900.0	0.00	0.00	0.00	0.0	0.0	0.0
1,000.0	1,000.0	0.00	0.00	0.00	0.0	0.0	0.0
1,100.0	1,100.0	0.00	0.00	0.00	0.0	0.0	0.0

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.15-T32N-R05W
Site: Eul Road
Well: Carracas 15A #4H
Wellbore: Horizontal OPE FTC
Design: Plan #2

Local Co-ordinate Reference: Well Carracas 15A #4H
TVD Reference: KB @ 7545.0ft (KB)
MD Reference: KB @ 7545.0ft (KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
1,200.0	1,200.0	0.00	0.00	0.00	0.0	0.0	0.0
1,300.0	1,300.0	0.00	0.00	0.00	0.0	0.0	0.0
1,400.0	1,400.0	0.00	0.00	0.00	0.0	0.0	0.0
1,500.0	1,500.0	0.00	0.00	0.00	0.0	0.0	0.0
1,600.0	1,600.0	0.00	0.00	0.00	0.0	0.0	0.0
1,700.0	1,700.0	0.00	0.00	0.00	0.0	0.0	0.0
1,800.0	1,800.0	0.00	0.00	0.00	0.0	0.0	0.0
1,900.0	1,900.0	0.00	0.00	0.00	0.0	0.0	0.0
2,000.0	2,000.0	0.00	0.00	0.00	0.0	0.0	0.0
2,060.0	2,060.0	0.00	0.00	0.00	0.0	0.0	0.0
Nacimiento							
2,100.0	2,100.0	0.00	0.00	0.00	0.0	0.0	0.0
2,200.0	2,200.0	0.00	0.00	0.00	0.0	0.0	0.0
2,300.0	2,300.0	0.00	0.00	0.00	0.0	0.0	0.0
2,400.0	2,400.0	0.00	0.00	0.00	0.0	0.0	0.0
2,500.0	2,500.0	0.00	0.00	0.00	0.0	0.0	0.0
2,600.0	2,600.0	0.00	0.00	0.00	0.0	0.0	0.0
2,700.0	2,700.0	0.00	0.00	0.00	0.0	0.0	0.0
2,800.0	2,800.0	0.00	0.00	0.00	0.0	0.0	0.0
2,900.0	2,900.0	0.00	0.00	0.00	0.0	0.0	0.0
3,000.0	3,000.0	0.00	0.00	0.00	0.0	0.0	0.0
3,100.0	3,100.0	0.00	0.00	0.00	0.0	0.0	0.0
3,125.0	3,125.0	0.00	0.00	0.00	0.0	0.0	0.0
KOP							
3,150.0	3,150.0	1.63	271.62	6.50	0.0	-0.4	0.4
3,200.0	3,199.9	4.88	271.62	6.50	0.1	-3.2	3.2
3,250.0	3,249.6	8.13	271.62	6.50	0.2	-8.8	8.9
3,300.0	3,298.9	11.38	271.62	6.50	0.5	-17.3	17.3
3,310.4	3,309.0	12.05	271.62	6.50	0.5	-19.4	19.4
Ojo Alamo SS							
3,350.0	3,347.6	14.63	271.62	6.50	0.8	-28.6	28.6
3,400.0	3,395.6	17.88	271.62	6.50	1.2	-42.5	42.6
3,446.1	3,439.0	20.87	271.62	6.50	1.6	-57.8	57.8
Kirtland Sh							
3,450.0	3,442.7	21.13	271.62	6.50	1.7	-59.2	59.3
3,500.0	3,488.8	24.38	271.62	6.50	2.2	-78.6	78.6
3,550.0	3,533.7	27.63	271.62	6.50	2.8	-100.5	100.5
3,600.0	3,577.3	30.88	271.62	6.50	3.5	-124.9	124.9
3,650.0	3,619.5	34.13	271.62	6.50	4.3	-151.8	151.8
3,700.0	3,660.1	37.39	271.62	6.50	5.1	-181.0	181.0
3,750.0	3,698.9	40.64	271.62	6.50	6.0	-212.4	212.5
3,800.0	3,735.9	43.89	271.62	6.50	6.9	-246.0	246.1
3,817.1	3,748.1	45.00	271.62	6.49	7.3	-258.0	258.1
3,818.2	3,748.9	45.00	271.62	0.00	7.3	-258.7	258.8
3,850.0	3,771.0	47.07	271.62	6.50	7.9	-281.6	281.8

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec. 15-T32N-R05W
Site: Eul Road
Well: Carracas 15A #4H
Wellbore: Horizontal OPE FTC
Design: Plan #2

Local Co-ordinate Reference: Well Carracas 15A #4H
TVD Reference: KB @ 7545.0ft (KB)
MD Reference: KB @ 7545.0ft (KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	EW (ft)	V. Sec (ft)
3,900.0	3,804.0	50.32	271.62	6.50	9.0	-319.2	319.3
3,950.0	3,834.8	53.57	271.62	6.50	10.1	-358.5	358.7
4,000.0	3,863.3	56.82	271.62	6.50	11.3	-399.6	399.7
4,050.0	3,889.5	60.07	271.62	6.50	12.5	-442.1	442.3
4,100.0	3,913.2	63.32	271.62	6.50	13.7	-486.1	486.3
4,115.4	3,920.0	64.32	271.62	6.50	14.1	-500.0	500.2
Fruitland Fm							
4,150.0	3,934.4	66.57	271.62	6.50	15.0	-531.4	531.6
4,200.0	3,952.9	69.82	271.62	6.50	16.3	-577.8	578.0
4,250.0	3,968.8	73.07	271.62	6.50	17.7	-625.2	625.4
4,300.0	3,982.0	76.33	271.62	6.50	19.0	-673.4	673.7
4,350.0	3,992.5	79.58	271.62	6.50	20.4	-722.3	722.6
4,377.4	3,997.0	81.36	271.62	6.50	21.2	-749.2	749.5
Top Target Coal							
4,400.0	4,000.1	82.83	271.62	6.50	21.8	-771.6	772.0
4,450.0	4,004.9	86.08	271.62	6.50	23.2	-821.4	821.7
4,500.0	4,006.9	89.33	271.62	6.50	24.6	-871.3	871.7
4,510.3	4,007.0	90.00	271.62	6.52	24.9	-881.6	882.0
Land Curve							
4,600.0	4,007.0	90.00	271.62	0.00	27.4	-971.3	971.7
4,700.0	4,007.0	90.00	271.62	0.00	30.3	-1,071.2	1,071.7
4,800.0	4,007.0	90.00	271.62	0.00	33.1	-1,171.2	1,171.7
4,900.0	4,007.0	90.00	271.62	0.00	35.9	-1,271.2	1,271.7
5,000.0	4,007.0	90.00	271.62	0.00	38.7	-1,371.1	1,371.7
5,100.0	4,007.0	90.00	271.62	0.00	41.6	-1,471.1	1,471.7
5,200.0	4,007.0	90.00	271.62	0.00	44.4	-1,571.0	1,571.7
5,300.0	4,007.0	90.00	271.62	0.00	47.2	-1,671.0	1,671.7
5,400.0	4,007.0	90.00	271.62	0.00	50.1	-1,771.0	1,771.7
5,500.0	4,007.0	90.00	271.62	0.00	52.9	-1,870.9	1,871.7
5,600.0	4,007.0	90.00	271.62	0.00	55.7	-1,970.9	1,971.7
5,700.0	4,007.0	90.00	271.62	0.00	58.5	-2,070.8	2,071.7
5,800.0	4,007.0	90.00	271.62	0.00	61.4	-2,170.8	2,171.7
5,900.0	4,007.0	90.00	271.62	0.00	64.2	-2,270.8	2,271.7
6,000.0	4,007.0	90.00	271.62	0.00	67.0	-2,370.7	2,371.7
6,100.0	4,007.0	90.00	271.62	0.00	69.8	-2,470.7	2,471.7
6,200.0	4,007.0	90.00	271.62	0.00	72.7	-2,570.6	2,571.7
6,300.0	4,007.0	90.00	271.62	0.00	75.5	-2,670.6	2,671.7
6,400.0	4,007.0	90.00	271.62	0.00	78.3	-2,770.6	2,771.7
6,500.0	4,007.0	90.00	271.62	0.00	81.2	-2,870.5	2,871.7
6,600.0	4,007.0	90.00	271.62	0.00	84.0	-2,970.5	2,971.7
6,700.0	4,007.0	90.00	271.62	0.00	86.8	-3,070.4	3,071.7
6,800.0	4,007.0	90.00	271.62	0.00	89.6	-3,170.4	3,171.7
6,900.0	4,007.0	90.00	271.62	0.00	92.5	-3,270.4	3,271.7
7,000.0	4,007.0	90.00	271.62	0.00	95.3	-3,370.3	3,371.7
7,100.0	4,007.0	90.00	271.62	0.00	98.1	-3,470.3	3,471.7

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.15-T32N-R05W
Site: Eul Road
Well: Carracas 15A #4H
Wellbore: Horizontal OPE FTC
Design: Plan #2

Local Co-ordinate Reference: Well Carracas 15A #4H
TVD Reference: KB @ 7545.0ft (KB)
MD Reference: KB @ 7545.0ft (KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	TVD (ft)	Inc (°)	Azi (°)	Build (°/100ft)	N/S (ft)	E/W (ft)	V. Sec (ft)
7,200.0	4,007.0	90.00	271.62	0.00	100.9	-3,570.2	3,571.7
7,300.0	4,007.0	90.00	271.62	0.00	103.8	-3,670.2	3,671.7
7,400.0	4,007.0	90.00	271.62	0.00	106.6	-3,770.2	3,771.7
7,500.0	4,007.0	90.00	271.62	0.00	109.4	-3,870.1	3,871.7
7,600.0	4,007.0	90.00	271.62	0.00	112.2	-3,970.1	3,971.7
7,700.0	4,007.0	90.00	271.62	0.00	115.1	-4,070.0	4,071.7
7,800.0	4,007.0	90.00	271.62	0.00	117.9	-4,170.0	4,171.7
7,900.0	4,007.0	90.00	271.62	0.00	120.7	-4,270.0	4,271.7
8,000.0	4,007.0	90.00	271.62	0.00	123.6	-4,369.9	4,371.7
8,100.0	4,007.0	90.00	271.62	0.00	126.4	-4,469.9	4,471.7
8,200.0	4,007.0	90.00	271.62	0.00	129.2	-4,569.8	4,571.7
8,227.9	4,007.0	90.00	271.62	0.00	130.0	-4,597.8	4,599.6

TD Lateral

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.15-T32N-R05W
Site: Eul Road
Well: Carracas 15A #4H
Wellbore: Horizontal OPE FTC
Design: Plan #2

Local Co-ordinate Reference: Well Carracas 15A #4H
TVD Reference: KB @ 7545.0ft (KB)
MD Reference: KB @ 7545.0ft (KB)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
KOP - plan hits target - Point	0.00	0.00	3,125.0	0.0	0.0	2,172,264.50	1,321,212.19	36° 57' 52.812 N	107° 20' 33.468 W
Land Curve - plan hits target - Point	0.00	0.00	4,007.0	24.9	-881.6	2,172,299.51	1,320,330.93	36° 57' 53.058 N	107° 20' 44.331 W
TD Lateral - plan misses by 5.6ft at 8227.9ft MD (4007.0 TVD, 130.0 N, -4597.8 E) - Point	0.00	0.00	4,007.0	130.0	-4,603.3	2,172,447.29	1,316,610.64	36° 57' 54.094 N	107° 21' 30.188 W

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
200.0	200.0	Surface	9-5/8	12-1/4
4,510.0	4,007.0	Intermediate	7	8-3/4
8,227.0	4,007.0	Liner	4-1/2	6-1/4

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,115.4	3,920.0	Fruitland Fm		0.00	
3,310.4	3,309.0	Ojo Alamo SS		0.00	
3,446.1	3,439.0	Kirtland Sh		0.00	
	4,021.0	Base Target Coal		0.00	
4,377.4	3,997.0	Top Target Coal		0.00	
2,060.0	2,060.0	Nacimiento		0.00	

Checked By: _____ Approved By: _____ Date: _____