

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED
OMB NO. 1004-0137
Expires July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS

FEB 25 2010

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

Bureau of Land Management
Farmington Field Office

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

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

SHL: (L) Sec.16, T32N, R04W 1705'FSL & 940'FWL

BHL: (P) Sec.16, T32N, R04W 1200'FSL & 110'FEL



Phone No. (include area code)
(505) 325-6800

5. Lease Serial No.

NMNM 30014

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Carracas 16B # 15

9. API Well No.

30-039-30464

10. Field and Pool, or Exploratory Area

Basin Fruitland Coal

11. County or Parish, State

Rio Arriba NM

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 change to the Carracas 16B #15. The changes will be pertaining to the landing point of the 7" int. casing and the BHL:

- * Change kick-off point to 2400'MD
- * Change int. casing setting measured depth (MD) TD to 4798' MD and cement with 564 sks lead followed by 150 sks tail. 100% excess
- * Change the TD of the well to 8138' (MD) and run the 4 1/2" liner to this depth with a new liner top of 4698' (MD).
- * Change the bottom hole footage location to 1200'FSL 110'FEL

Attached is a revised directional drilling and operations plan.

The changes made reflect NMOCD approval for Order No. R-13119 Carracas Canyon. ✓

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

Stephen Byers

Date 02/25/2010

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Troy L. Salvors

Title

Petroleum Engineer

Date

3/24/2010

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
1625 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 & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-30464		² Pool Code 71629		³ Pool Name Basin Fruitland Coal	
⁴ Property Code 35658		⁵ Property Name CARRACAS 16B			⁶ Well Number 15
⁷ OGRID No. 162928		⁸ Operator Name ENERGEN RESOURCES CORPORATION			⁹ Elevation 6802'

¹⁰ Surface Location

UL or lot no. L	Section 16	Township 32N	Range 4W	Lot Idn	Feet from the 1705	North/South line SOUTH	Feet from the 940	East/West line WEST	County RIO ARriba
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¹¹ Bottom Hole Location If Different From Surface

UL or lot no. P	Section 16	Township 32N	Range 4W	Lot Idn	Feet from the 1200	North/South line SOUTH	Feet from the 110	East/West line EAST	County RIO ARriba
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¹² Dedicated Acres 320 S/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13119
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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.

					¹⁷ OPERATOR CERTIFICATION <i>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 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.</i> Signature: <u>Stephen Byers</u> Date: <u>02/25/2010</u> Printed Name: <u>STEPHEN BYERS</u>	
					¹⁸ SURVEYOR CERTIFICATION <i>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.</i> JUNE 21, 2007 Date of Survey Original Survey Conducted and Recorded By: David Russell 10201 Certificate Number	

2/25/2010



OPERATIONS PLAN

WELL NAME.....Carracas 16B #15
JOB TYPE.....Horizontal OPE FTC
DEPT.....Drilling and Completions
PREPARED BY.....Stephen Byers

GENERAL INFORMATION

Surface Location	1705 FSL 940 FWL
S-T-R	(L) Sec.16, T32N, R04W
Bottom Hole Location	1200 FSL 110 FEL
S-T-R	P (L) Sec.16, T32N, R04W
County, State	Rio Arriba, New Mexico
Elevations	6802' GL
Total Depth	8138' +/- (MD); 3549' (TVD)
Formation Objective	Basin Fruitland Coal

FORMATION TOPS

San Jose	Surface
Nacimiento	1727' (TVD)
Ojo Alamo Ss	3001' (TVD)
Kirtland Sh	3139' (TVD)
Fruitland Fm	3251' (TVD) 3603'MD
Top Target Coal	3537' (TVD) 4578'MD
Base Target Coal	3560' (TVD)
Total Depth	3549' (TVD), 8138' (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 2400' TVD with 7.04°/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: 3337' TVD, 3820' MD to TD

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

2/25/2010

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	0	4798	8-3/4"	7"	23 lb/ft	J-55 LT&C
TVD	0	3549				
Prod. Liner	4698	8138	6-1/4"	4-1/2"	11.6 lb/ft	J-55 LT&C
TVD	3547	3549				
Tubing	0	4500	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: 125 sks Type V with 2.0 % CaCl₂ and ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk 148 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 564 sks 65/35 with 6.0 % Bentonite, 2.0 % CaCl₂, 10 #/sk Gilsonite, and ½ #/sk Flocele (12.3 ppg, 1.93 ft³/sk) and a tail of 150 sks Class G with ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk). (1442 ft³ of slurry, 100% excess to circulate to surface). WOC 12 hours. Test casing to 1200 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

Carson National Forest Sec.16-T32N-R4W

Carracas Rim

Carracas 16B #15

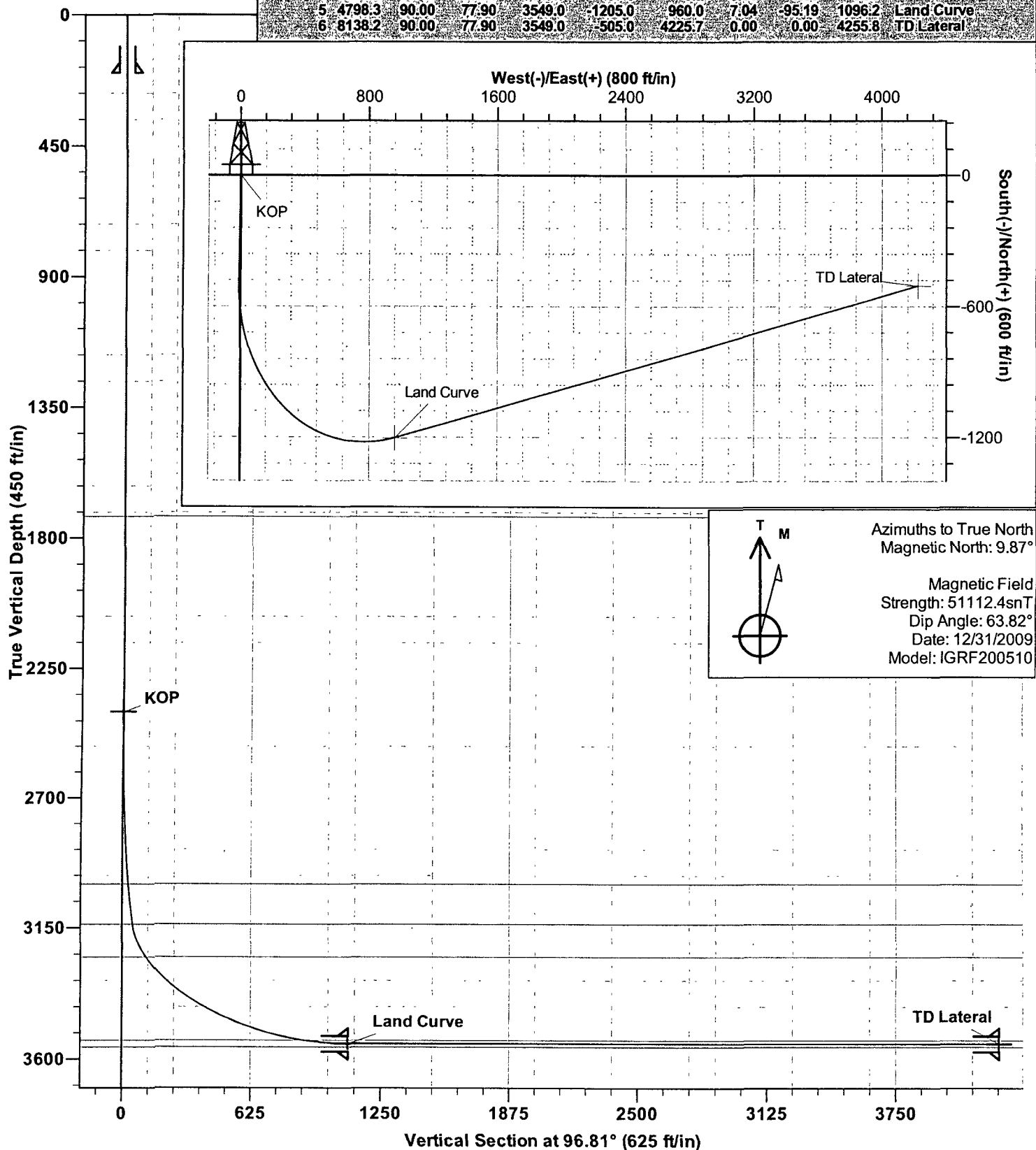
Horizontal OPE FTC /

Plan: Plan #1

DIRECTIONAL PLAN

25 February, 2010

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2400.0	0.00	0.00	2400.0	0.0	0.0	0.00	0.00	0.0	KOP
3	3343.9	66.48	180.72	3145.9	-488.8	-6.1	7.04	180.72	51.9	
4	3353.8	66.48	180.72	3149.9	-497.8	-6.2	0.00	0.00	52.9	
5	4798.3	90.00	77.90	3549.0	-1205.0	960.0	7.04	-95.19	1096.2	Land Curve
6	8138.2	90.00	77.90	3549.0	-505.0	4225.7	0.00	0.00	4255.8	TD Lateral



Energen

DIRECTIONAL PLAN

Company: Energen Resources	Local Co-ordinate Reference: Well Carracas 16B #15
Project: Carson National Forest Sec.16-T32N-R4W	TVD Reference: KB @ 6817.0ft (KB)
Site: Carracas Rim	MD Reference: KB @ 6817.0ft (KB)
Well: Carracas 16B #15	North Reference: True
Wellbore: Horizontal OPE FTC	Survey Calculation Method: Minimum Curvature
Design: Plan #1	Database: EDM 2003.16 Single User Db

Project: Carson National Forest Sec.16-T32N-R4W		
Map System: US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum: North American Datum 1983		
Map Zone: New Mexico Central Zone		

Site: Carracas Rim		
Site Position:	Northing: 2,179,072.29ft	Latitude: 36° 59' 2.580 N
From: Lat/Long	Easting: 1,343,701.35ft	Longitude: 107° 15' 57.276 W
Position Uncertainty: 0.0 ft	Slot Radius: "	Grid Convergence: -0.61 °

Well: Carracas 16B #15		
Well Position	Northing: 2,179,072.29 ft	Latitude: 36° 59' 2.580 N
+N/-S 0.0 ft	Easting: 1,343,701.35 ft	Longitude: 107° 15' 57.276 W
+E/-W 0.0 ft		
Position Uncertainty 0.0 ft	Wellhead Elevation: 6,802.0 ft	Ground Level: 6,802.0 ft

Wellbore: Horizontal OPE FTC		
Magnetics	Model Name	Sample Date
	IGRF200510	12/31/2009
	Declination (°)	Dip Angle (°)
	9.87	63.82
		Field Strength (nT)
		51,112

Design: Plan #1		
Audit Notes:		
Version:	Phase: PROTOTYPE	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	Direction
	(ft)	(°)
	0.0	96.81

Survey Tool Program	Date: 2/25/2010	
From (ft)	To (ft)	Survey (Wellbore)
0.0	8,138.2	Plan #1 (Horizontal OPE FTC)
		Tool Name
		MWD
		Description
		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.16-T32N-R4W
Site: Carracas Rim
Well: Carracas 16B #15
Wellbore: Horizontal OPE FTC
Design: Plan #1

Local Co-ordinate Reference: Well Carracas 16B #15
TVD Reference: KB @ 6817.0ft (KB)
MD Reference: KB @ 6817.0ft (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
1,727.0	1,727.0	0.00	0.00	0.00	0.0	0.0	0.0
Nacimiento							
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
2,100.0	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
KOP							
2,450.0	2,450.0	3.52	180.72	7.04	-1.5	0.0	0.2
2,500.0	2,499.7	7.04	180.72	7.04	-6.1	-0.1	0.7
2,550.0	2,549.2	10.56	180.72	7.04	-13.8	-0.2	1.5
2,600.0	2,598.0	14.09	180.72	7.04	-24.5	-0.3	2.6
2,650.0	2,646.1	17.61	180.72	7.04	-38.1	-0.5	4.0
2,700.0	2,693.2	21.13	180.72	7.04	-54.7	-0.7	5.8
2,750.0	2,739.3	24.65	180.72	7.04	-74.1	-0.9	7.9
2,800.0	2,784.1	28.17	180.72	7.04	-96.4	-1.2	10.2
2,850.0	2,827.4	31.69	180.72	7.04	-121.3	-1.5	12.9
2,900.0	2,869.1	35.21	180.72	7.04	-148.9	-1.9	15.8
2,950.0	2,909.1	38.73	180.72	7.04	-178.9	-2.2	19.0
3,000.0	2,947.1	42.26	180.72	7.04	-211.4	-2.7	22.5
3,050.0	2,983.0	45.78	180.72	7.04	-246.1	-3.1	26.1
3,076.2	3,001.0	47.62	180.72	7.04	-265.2	-3.3	28.2
Ojo Alamo SS							
3,100.0	3,016.8	49.30	180.72	7.04	-283.0	-3.6	30.1
3,150.0	3,048.2	52.82	180.72	7.04	-321.9	-4.0	34.2
3,200.0	3,077.2	56.34	180.72	7.04	-362.6	-4.5	38.5
3,250.0	3,103.6	59.86	180.72	7.04	-405.1	-5.1	43.0
3,300.0	3,127.3	63.38	180.72	7.04	-449.0	-5.6	47.7
3,326.9	3,139.0	65.28	180.72	7.04	-473.3	-5.9	50.3
Kirtland Sh							
3,343.9	3,145.9	66.48	180.72	7.04	-488.8	-6.1	51.9
3,353.8	3,149.9	66.48	180.72	0.00	-497.8	-6.2	52.9
3,400.0	3,168.4	66.22	177.17	-0.55	-540.2	-5.5	58.7
3,450.0	3,188.7	66.04	173.33	-0.37	-585.7	-1.7	67.8
3,500.0	3,209.0	65.95	169.47	-0.18	-630.9	5.1	80.0
3,550.0	3,229.4	65.96	165.62	0.02	-675.5	15.0	95.0
3,600.0	3,249.7	66.06	161.77	0.21	-719.3	27.8	113.0

Energen DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.16-T32N-R4W
Site: Carracas Rim
Well: Carracas 16B #15
Wellbore: Horizontal OPE FTC
Design: Plan #1

Local Co-ordinate Reference: Well Carracas 16B #15
TVD Reference: KB @ 6817.0ft (KB)
MD Reference: KB @ 6817.0ft (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)
3,603.1	3,251.0	66.07	161.53	0.31	-722.0	28.7	114.2
Fruitland Fm							
3,650.0	3,269.9	66.27	157.92	0.41	-762.2	43.6	133.7
3,700.0	3,290.0	66.56	154.09	0.59	-804.1	62.2	157.2
3,750.0	3,309.7	66.95	150.28	0.78	-844.7	83.6	183.3
3,800.0	3,329.1	67.43	146.50	0.96	-883.9	107.8	211.9
3,850.0	3,348.1	68.00	142.74	1.13	-921.6	134.6	243.0
3,900.0	3,366.5	68.65	139.02	1.30	-957.7	163.9	276.4
3,950.0	3,384.4	69.38	135.33	1.47	-991.9	195.6	311.9
4,000.0	3,401.7	70.19	131.68	1.62	-1,024.2	229.6	349.5
4,050.0	3,418.3	71.08	128.07	1.77	-1,054.4	265.8	389.1
4,100.0	3,434.1	72.03	124.49	1.91	-1,082.5	304.1	430.4
4,150.0	3,449.1	73.05	120.96	2.04	-1,108.3	344.2	473.3
4,200.0	3,463.3	74.13	117.46	2.16	-1,131.7	386.0	517.6
4,250.0	3,476.5	75.26	114.01	2.27	-1,152.6	429.5	563.2
4,300.0	3,488.7	76.44	110.59	2.37	-1,171.0	474.3	609.9
4,350.0	3,499.9	77.67	107.20	2.46	-1,186.8	520.4	657.6
4,400.0	3,510.0	78.95	103.85	2.54	-1,199.9	567.6	706.0
4,450.0	3,519.1	80.25	100.52	2.62	-1,210.2	615.7	754.9
4,500.0	3,526.9	81.59	97.23	2.68	-1,217.8	664.4	804.2
4,550.0	3,533.7	82.96	93.95	2.73	-1,222.7	713.7	853.8
4,578.8	3,537.0	83.76	92.07	2.77	-1,224.2	742.3	882.3
Top Target Coal							
4,600.0	3,539.2	84.35	90.70	2.79	-1,224.7	763.4	903.3
4,650.0	3,543.5	85.76	87.46	2.82	-1,223.9	813.2	952.7
4,700.0	3,546.6	87.18	84.23	2.84	-1,220.3	862.9	1,001.6
4,750.0	3,548.4	88.61	81.01	2.86	-1,213.8	912.5	1,050.1
4,798.3	3,549.0	90.00	77.90	2.87	-1,205.0	960.0	1,096.2
Land Curve							
4,800.0	3,549.0	90.00	77.90	0.00	-1,204.7	961.6	1,097.8
4,900.0	3,549.0	90.00	77.90	0.00	-1,183.7	1,059.4	1,192.4
5,000.0	3,549.0	90.00	77.90	0.00	-1,162.7	1,157.2	1,287.0
5,100.0	3,549.0	90.00	77.90	0.00	-1,141.8	1,255.0	1,381.6
5,200.0	3,549.0	90.00	77.90	0.00	-1,120.8	1,352.7	1,476.2
5,300.0	3,549.0	90.00	77.90	0.00	-1,099.8	1,450.5	1,570.8
5,400.0	3,549.0	90.00	77.90	0.00	-1,078.9	1,548.3	1,665.4
5,500.0	3,549.0	90.00	77.90	0.00	-1,057.9	1,646.1	1,760.0
5,600.0	3,549.0	90.00	77.90	0.00	-1,037.0	1,743.8	1,854.6
5,700.0	3,549.0	90.00	77.90	0.00	-1,016.0	1,841.6	1,949.2
5,800.0	3,549.0	90.00	77.90	0.00	-995.0	1,939.4	2,043.8
5,900.0	3,549.0	90.00	77.90	0.00	-974.1	2,037.2	2,138.4
6,000.0	3,549.0	90.00	77.90	0.00	-953.1	2,135.0	2,233.0
6,100.0	3,549.0	90.00	77.90	0.00	-932.1	2,232.7	2,327.6
6,200.0	3,549.0	90.00	77.90	0.00	-911.2	2,330.5	2,422.2
6,300.0	3,549.0	90.00	77.90	0.00	-890.2	2,428.3	2,516.8

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.16-T32N-R4W
Site: Carracas Rim
Well: Carracas 16B #15
Wellbore: Horizontal OPE FTC
Design: Plan #1

Local Co-ordinate Reference: Well Carracas 16B #15
TVD Reference: KB @ 6817.0ft (KB)
MD Reference: KB @ 6817.0ft (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)
6,400.0	3,549.0	90.00	77.90	0.00	-869.3	2,526.1	2,611.4
6,500.0	3,549.0	90.00	77.90	0.00	-848.3	2,623.9	2,706.0
6,600.0	3,549.0	90.00	77.90	0.00	-827.3	2,721.6	2,800.6
6,700.0	3,549.0	90.00	77.90	0.00	-806.4	2,819.4	2,895.2
6,800.0	3,549.0	90.00	77.90	0.00	-785.4	2,917.2	2,989.8
6,900.0	3,549.0	90.00	77.90	0.00	-764.5	3,015.0	3,084.4
7,000.0	3,549.0	90.00	77.90	0.00	-743.5	3,112.7	3,179.0
7,100.0	3,549.0	90.00	77.90	0.00	-722.5	3,210.5	3,273.6
7,200.0	3,548.9	90.00	77.90	0.00	-701.6	3,308.3	3,368.2
7,300.0	3,548.9	90.00	77.90	0.00	-680.6	3,406.1	3,462.8
7,400.0	3,548.9	90.00	77.90	0.00	-659.6	3,503.9	3,557.4
7,500.0	3,548.9	90.00	77.90	0.00	-638.7	3,601.6	3,652.0
7,600.0	3,548.9	90.00	77.90	0.00	-617.7	3,699.4	3,746.6
7,700.0	3,548.9	90.00	77.90	0.00	-596.8	3,797.2	3,841.2
7,800.0	3,548.9	90.00	77.90	0.00	-575.8	3,895.0	3,935.8
7,900.0	3,548.9	90.00	77.90	0.00	-554.8	3,992.7	4,030.4
8,000.0	3,548.9	90.00	77.90	0.00	-533.9	4,090.5	4,125.0
8,100.0	3,548.9	90.00	77.90	0.00	-512.9	4,188.3	4,219.6
8,138.2	3,549.0	90.00	77.90	-0.01	-505.0	4,225.7	4,255.8

TD Lateral

Energen

DIRECTIONAL PLAN

Company: Energen Resources
Project: Carson National Forest Sec.16-T32N-R4W
Site: Carracas Rim
Well: Carracas 16B #15
Wellbore: Horizontal OPE FTC
Design: Plan #1

Local Co-ordinate Reference: Well Carracas 16B #15
TVD Reference: KB @ 6817.0ft (KB)
MD Reference: KB @ 6817.0ft (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	2,400.0	0.0	0.0	2,179,072.29	1,343,701.35	36° 59' 2.580 N	107° 15' 57.276 W
TD Lateral - plan hits target - Point	0.00	0.00	3,549.0	-505.0	4,225.7	2,178,522.23	1,347,921.42	36° 58' 57.584 N	107° 15' 5.196 W
Land Curve - plan hits target - Point	0.00	0.00	3,549.0	-1,205.0	960.0	2,177,857.11	1,344,648.44	36° 58' 50.665 N	107° 15' 45.445 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
4,798.0	3,549.0	Intermediate	7	8-3/4
8,138.0	3,548.9	Liner	4-1/2	6-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,578.8	3,537.0	Top Target Coal		0.00	
	3,560.0	Base Target Coal		0.00	
3,603.1	3,251.0	Fruitland Fm		0.00	
1,727.0	1,727.0	Nacimiento		0.00	
3,326.9	3,139.0	Kirtland Sh		0.00	
3,076.2	3,001.0	Ojo Alamo SS		0.00	

Checked By: _____ Approved By: _____ Date: _____