

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

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

APPLICATION FOR PERMIT TO DRILL OR REENTER APR 29 2011

1a. Type of Work ☒ DRILL ☐ REENTER		5. Lease Serial No. USA NMNM 59698 28812
1b. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator Energen Resources Corporation		7. Unit or CA Agreement Name and No.
3a. Address 2010 Afton Place Farmington, New Mexico 87401		8. Lease Name and Well No. Carracas Unit #508H
3b. Phone No. (include area code) (505) 325-6800		9. API Well No. 30-039-31063
4. Location of Well (Report location clearly and in accordance with any State requirements)* At surface 1921 FSL, 887 FEL Sec. 22 T32N R4W At proposed prod. zone 1700 FSL, 100 FSL Sec 23 T32N R4W		10. Field and Pool, or Exploratory Lewis Shale - WC Mesa Verde
14. Distance in miles and direction from nearest town or post office* Approx. 9 miles SE of Arboles, CO.		11. Sec., T., R., M., or Blk. and Survey or Area Sec 23, T32N, R4W
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. unit line, if any) 959'	16. No. of Acres in lease 1920	17. Spacing Unit dedicated to this well 320.00 SW/4-160ac 160 SW/4 S/2 SE/4-160ac
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 87'	19. Proposed Depth 10847' (MD)	20. BLM/BIA Bond No. on file
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6711' GL	22. Approximate date work will start* 4/1/2012	23. Estimated duration 25 days

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

24. Attachments

DRILLING OPERATIONS AUTHORIZED ARE
SUBJECT TO COMPLIANCE WITH ATTACHED
GENERAL REQUIREMENTS*

- The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:
- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM |

RCVD JUN 10 '11

OIL CONS. DIV.

DIST. 3

25. Signature 	Name (Printed/Typed) Devin Mills	Date 04/27/11
Title Drilling Engineer		
Approved by (Signature) 	Name (Printed/Typed) AEM	Date 6/1/11
Title AEM		

Application approval 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.
Conditions of approval, if any, are attached.

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.

(Continued on page 2)

A COMPLETE C-144 MUST BE SUBMITTED TO AND APPROVED BY THE NMOCD FOR: A PIT, CLOSED LOOP SYSTEM, BELOW GRADE TANK, OR PROPOSED ALTERNATIVE METHOD, PURSUANT TO NMOCD PART 19.15.17, PRIOR TO THE USE OR CONSTRUCTION OF THE ABOVE APPLICATIONS.

Hold C104
for Directional Survey
and "As Drilled" plat

SEP 20 2011

NMOC

Held For Amended
C-102 rec'd 8-31-11

NOTIFY AZTEC OGD 24 HRS.
PRIOR TO CASING & CEMENT

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240

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

State of New Mexico
Energy, Minerals & Natural Resources Department

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

RECEIVED
AUG 2011

OIL CONS. DIV. DIST. 3
Revised July 10, 2010

Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-039-31063		2 Pool Code 97877		3 Pool Name WC MESAVERDE 32N4W22I	
4 Property Code 30-039-31063 37168		5 Property Name CARRACAS UNIT			6 Well Number 508H
7 OGRID No. 162928		8 Operator Name ENERGEN RESOURCES CORPORATION			9 Elevation 6711'

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
1	22	32N	4W		1921'	SOUTH	887'	EAST	RIO ARRIBA

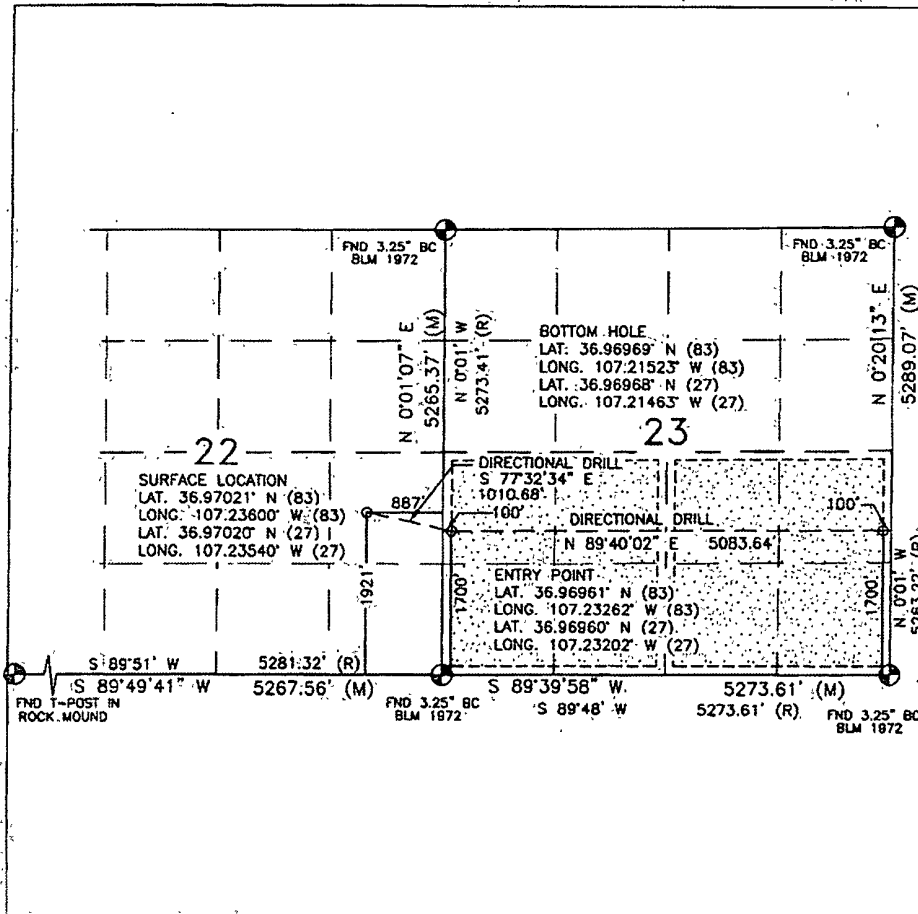
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	23	32N	4W		1700'	SOUTH	100'	EAST	RIO ARRIBA

12 Dedicated Acres SW/4 - 160.00 ACRES SE/4 - 160.00 ACRES		13 Joint or Infill		14 Consolidation Code		15 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

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 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.

Signature: *David Mills* Date: 8-31-11

Printed Name: *DAVID MILLS*

E-mail Address: *DMILLS@ENERGEN.COM*

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.

MAY 12, 2009

Date of Survey

Signature and Seal of Professional Surveyor:

David Russell
DAVID R. RUSSELL
REGISTERED PROFESSIONAL LAND SURVEYOR
NEW MEXICO
1025
Certificate Number: 10201

DRILLING PLAN



WELL NAME

Carracas Unit #508H

DEPTH

10,847' MD 4,972' TVD

FORMATION

Mesa Verde
(Lewis Navajo City)

DRILLING RIG

D & J #2

STATE

New Mexico

COUNTY

Rio Arriba

DRILLING ENGINEER

Devin Mills

LAT/LONG

36.97021° N
107.23600° W
(NAD 1983)



OPERATIONS PLAN

WELL NAME.....Carracas Unit #508H
JOB TYPE.....Horizontal Lewis Shale
DEPT.....Drilling and Completions
PREPARED BY.....Devin Mills

GENERAL INFORMATION

Surface Location	1921 FNL 887 FWL
S-T-R	(E) Sec.22, T32N, R04W
Bottom Hole Location	1700 FSL 100 FEL
S-T-R	(E) Sec.23, T32N, R04W
County, State	Rio Arriba, New Mexico
Elevations	6711' GL
Total Depth	10847' +/- (MD); 4972' (TVD)
Formation Objective	Lewis Shale – Navajo City

FORMATION TOPS

San Jose	Surface
Nacimiento	1823' (TVD)
Ojo Alamo Ss	3035' (TVD)
Kirtland Sh	3177' (TVD)
Fruitland Fm	3280' (TVD)
Top Coal Interval	3620' (TVD)
Pictured Cliffs	3698' (TVD)
Lewis Shale	3932' (TVD)
Huerfanito Bentonite	4800' (TVD), 4853' (MD)
*Top of Navajo City	4972' (TVD), 5100' (MD)
Navajo CityTarget	4517' (TVD)
Total Depth	4972' (TVD), 10847' (MD)

DRILLING

Surface: 12-1/4" wellbore will be drilled with a Low Solids Non-Dispersed mud system.

Intermediate: 8-3/4" wellbore will be drilled with a Lignosulfate Dispersed mud system. Weighting materials will be drill cuttings and if needed barite. Mud density is expected to range from 8.4 ppg to 9.1 ppg.

Production: 6-1/4" wellbore will be drilled with nitrogen foam. Anticipated BHP is 500 psi.

Projected KOP is 4200' TVD with 6.09°/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: 3932' TVD 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	400	12-1/4"	9-5/8"	32.3 lb/ft	H-40 ST&C
Intermediate TVD	0 0	5800 5167	8-3/4"	7"	23 lb/ft	J-55 LT&C
Prod. Liner TVD	5600 5167	10845 4972	6-1/4"	4-1/2"	11.6 lb/ft	L/N-80 LT&C
Tubing	0	5200	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 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.

Liner: Bull nose guide shoe on bottom of first joint, Packers Plus liner hanger and frac sleeves at frac intervals.

WELLHEAD

11" 3000 x 9 5/8" weld/slip on casing head. 11" 3000 x 7 1/16" Christmas Tree.

CEMENTING

Surface Casing: 220 sks Type V with 2.0 % CaCl₂ and ¼ #/sk Flocele (15.6 ppg, 1.18 ft³/sk 250 ft³ of slurry, 100 % excess to circulate to surface). WOC 12 hours. Pressure test surface casing to 750 psi for 30 min. Nipple up BOP after WOC. Test BOP to 250 psi low, 1200 psi high for 15 min each. Test choke manifold to 1200 psi for 30 min.

Intermediate Casing: Lead with 380 sks San Juan PRB II with 5#/sk Gilsonite and ¼ #/sk Flocele (12.3 ppg, 2.27 ft³/sk), and tail of 100 sks San Juan PRB II with 5#/sk Gilsonite and ¼ #/sk Flocele (13.5 ppg, 1.81 ft³/sk) 1044 ft³ of slurry, 20% open hole excess to circulate to surface. WOC 12 hours. Test BOP as outlined in 'Drilling' section. Test manifold as outlined in 'Drilling' section. 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 a frac completion lined with an uncemented liner and packer system. The Navajo City portion of the Lewis Shale will be fracture stimulated..
- 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.

Project: Carson National Forest

Site: 22B; T32N R4W

Well: Carracas Unit #508H

Wellbore: Wellbore #1

Design #1 (Carracas Unit #508H/Wellbore

PROJECT DETAILS: Carson National Forest

Geodetic System: US State Plane 1983

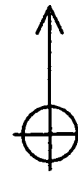
Datum: North American Datum 1983

Ellipsoid: GRS 1980

Zone: New Mexico Central Zone

System Datum: Mean Sea Level

T/M



Azimuths to True North

Magnetic North: 0.00°

Magnetic Field

Strength: 0.0snT

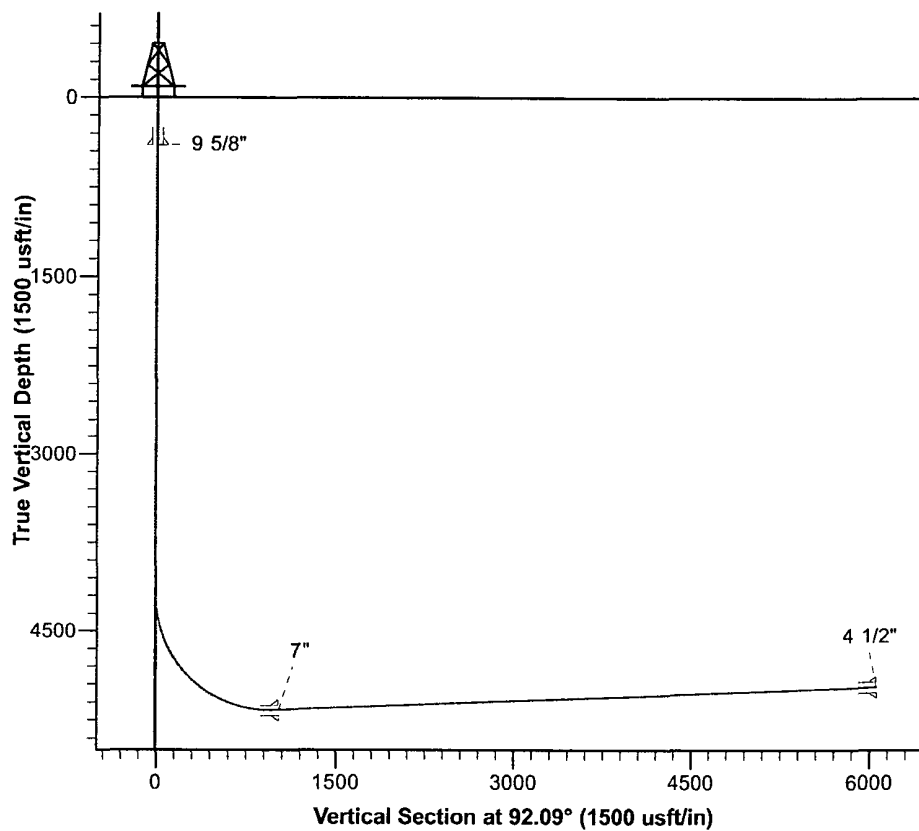
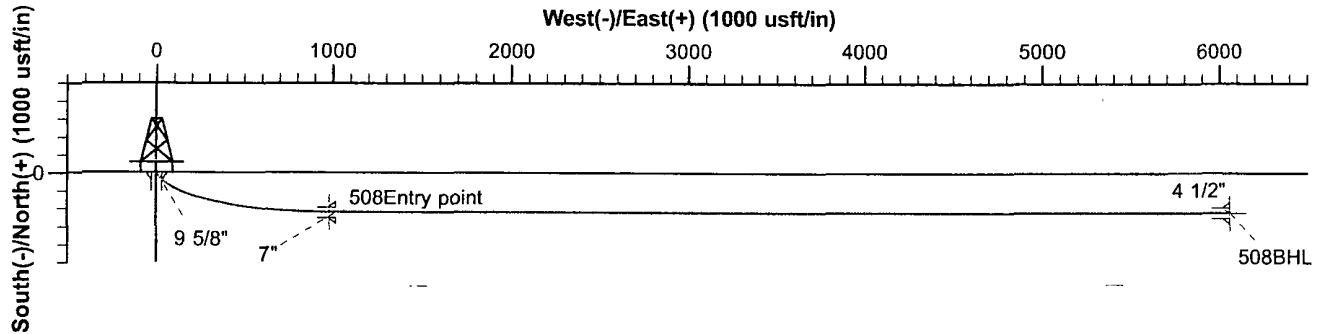
Dip Angle: 0.00°

Date: 3/28/2011

Model: USER DEFINED

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4150.0	0.00	0.00	4150.0	0.0	0.0	0.00	0.00	0.0	
3	4438.3	17.55	140.45	4433.8	-33.8	27.9	6.09	140.45	29.1	
4	5770.2	92.24	90.00	5170.0	-221.0	987.0	6.09	-51.25	994.4	508Entry point
5	10847.1	92.24	90.00	4972.0	-221.0	6060.0	0.00	0.00	6064.0	508BHL



Energen

APD Report

Company: Energen Resources
Project: Carson National Forest
Site: 22B; T32N R4W
Well: Carracas Unit #508H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Site 22B; T32N R4W
TVD Reference: WELL @ 6724.0usft (Original Well Elev)
MD Reference: WELL @ 6724.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project		Carson National Forest	
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site		22B; T32N R4W	
Site Position:		Northing:	0.00 usft
From:	None	Easting:	0.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	0° 0' 0.000 N
		Longitude:	0° 0' 0.000 E
		Grid Convergence:	0.00 °

Well		Carracas Unit #508H	
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft		Wellhead Elevation:
			usft
			Latitude:
			30° 53' 39.079 N
			Longitude:
			111° 28' 36.030 W
			Ground Level:
			6,711.0 usft

Wellbore		Wellbore #1	
Magnetics	Model Name	Sample Date	Declination
	User Defined	3/28/2011	(°)
			0.00
			Dip Angle
			(°)
			0.00
			Field Strength
			(nT)
			0

Design		Design #1	
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			92.09

Survey Tool Program		Date	3/29/2011
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
0.0	10,847.1	Design #1 (Wellbore #1)	MWD
			Description
			MWD - Standard

Energen APD Report

Company: Energen Resources
Project: Carson National Forest
Site: 22B; T32N R4W
Well: Carracas Unit #508H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Site 22B; T32N R4W
TVD Reference: WELL @ 6724.0usft (Original Well Elev)
MD Reference: WELL @ 6724.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.00
400.0	0.00	0.00	0.0	0.0	0.0	0.00
9 5/8"						
1,823.0	0.00	0.00	0.0	0.0	0.0	0.00
Nacimiento						
3,035.0	0.00	0.00	0.0	0.0	0.0	0.00
Ojo Alamo						
3,177.0	0.00	0.00	0.0	0.0	0.0	0.00
Kirtland						
3,280.0	0.00	0.00	0.0	0.0	0.0	0.00
Fruitland						
3,620.0	0.00	0.00	0.0	0.0	0.0	0.00
Fruitland Coal						
3,698.0	0.00	0.00	0.0	0.0	0.0	0.00
Pictured Cliffs						
3,932.0	0.00	0.00	0.0	0.0	0.0	0.00
Lewis						
4,150.0	0.00	0.00	0.0	0.0	0.0	0.00
4,200.0	3.04	140.45	0.9	-1.0	0.8	6.09
4,300.0	9.13	140.45	7.9	-9.2	7.6	6.09
4,400.0	15.22	140.45	21.9	-25.5	21.0	6.09
4,438.3	17.55	140.45	29.1	-33.8	27.9	6.09
4,500.0	20.11	131.90	43.5	-48.1	41.7	6.09
4,600.0	24.89	121.97	74.9	-70.7	72.4	6.09
4,700.0	30.12	115.19	116.3	-92.5	113.0	6.09
4,800.0	35.60	110.29	167.1	-113.3	163.1	6.09
4,853.6	38.61	108.18	198.0	-124.0	193.6	6.09
Huefanito Bentonite						
4,900.0	41.24	106.57	226.7	-132.9	222.0	6.09

Energen APD Report

Company: Energen Resources
Project: Carson National Forest
Site: 22B; T32N R4W
Well: Carracas Unit #508H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Site 22B, T32N R4W
TVD Reference: WELL @ 6724.0usft (Original Well Elev)
MD Reference: WELL @ 6724.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)
5,000.0	46.97	103.60	294.5	-150.9	289.2	6.09
5,100.0	52.76	101.14	369.7	-167.2	363.8	6.09
5,100.3	52.78	101.13	369.9	-167.2	364.1	6.09
Navajo City Top						
5,200.0	58.60	99.04	451.4	-181.6	445.1	6.09
5,300.0	64.46	97.18	538.8	-193.9	532.1	6.09
5,400.0	70.35	95.50	630.8	-204.1	623.8	6.09
5,500.0	76.25	93.94	726.5	-211.9	719.2	6.09
5,600.0	82.16	92.45	824.6	-217.4	817.3	6.09
5,694.7	87.76	91.08	918.9	-220.3	911.5	6.09
Navajo City Base						
5,700.0	88.08	91.01	924.2	-220.4	916.8	6.09
5,770.2	92.24	90.00	994.4	-221.0	987.0	6.09
508 Entry point						
5,800.0	92.24	90.00	1,024.2	-221.0	1,016.8	0.00
7"						
5,900.0	92.24	90.00	1,124.0	-221.0	1,116.7	0.00
6,000.0	92.24	90.00	1,223.9	-221.0	1,216.6	0.00
6,100.0	92.24	90.00	1,323.7	-221.0	1,316.5	0.00
6,200.0	92.24	90.00	1,423.6	-221.0	1,416.5	0.00
6,300.0	92.24	90.00	1,523.4	-221.0	1,516.4	0.00
6,400.0	92.24	90.00	1,623.3	-221.0	1,616.3	0.00
6,500.0	92.24	90.00	1,723.2	-221.0	1,716.2	0.00
6,600.0	92.24	90.00	1,823.0	-221.0	1,816.2	0.00
6,700.0	92.24	90.00	1,922.9	-221.0	1,916.1	0.00
6,800.0	92.24	90.00	2,022.7	-221.0	2,016.0	0.00
6,900.0	92.24	90.00	2,122.6	-221.0	2,115.9	0.00
7,000.0	92.24	90.00	2,222.4	-221.0	2,215.9	0.00

Energen APD Report

Company: Energen Resources
Project: Carson National Forest
Site: 22B; T32N R4W
Well: Carracas Unit #508H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Site 22B, T32N R4W
TVD Reference: WELL @ 6724.0usft (Original Well Elev)
MD Reference: WELL @ 6724.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)
7,100.0	92.24	90.00	2,322.3	-221.0	2,315.8	0.00
7,200.0	92.24	90.00	2,422.2	-221.0	2,415.7	0.00
7,300.0	92.24	90.00	2,522.0	-221.0	2,515.6	0.00
7,400.0	92.24	90.00	2,621.9	-221.0	2,615.6	0.00
7,500.0	92.24	90.00	2,721.7	-221.0	2,715.5	0.00
7,600.0	92.24	90.00	2,821.6	-221.0	2,815.4	0.00
7,700.0	92.24	90.00	2,921.4	-221.0	2,915.3	0.00
7,800.0	92.24	90.00	3,021.3	-221.0	3,015.2	0.00
7,900.0	92.24	90.00	3,121.2	-221.0	3,115.2	0.00
8,000.0	92.24	90.00	3,221.0	-221.0	3,215.1	0.00
8,100.0	92.24	90.00	3,320.9	-221.0	3,315.0	0.00
8,200.0	92.24	90.00	3,420.7	-221.0	3,414.9	0.00
8,300.0	92.24	90.00	3,520.6	-221.0	3,514.9	0.00
8,400.0	92.24	90.00	3,620.4	-221.0	3,614.8	0.00
8,500.0	92.24	90.00	3,720.3	-221.0	3,714.7	0.00
8,600.0	92.24	90.00	3,820.2	-221.0	3,814.6	0.00
8,700.0	92.24	90.00	3,920.0	-221.0	3,914.6	0.00
8,800.0	92.24	90.00	4,019.9	-221.0	4,014.5	0.00
8,900.0	92.24	90.00	4,119.7	-221.0	4,114.4	0.00
9,000.0	92.24	90.00	4,219.6	-221.0	4,214.3	0.00
9,100.0	92.24	90.00	4,319.4	-221.0	4,314.3	0.00
9,200.0	92.24	90.00	4,419.3	-221.0	4,414.2	0.00
9,300.0	92.24	90.00	4,519.2	-221.0	4,514.1	0.00
9,400.0	92.24	90.00	4,619.0	-221.0	4,614.0	0.00
9,500.0	92.24	90.00	4,718.9	-221.0	4,714.0	0.00
9,600.0	92.24	90.00	4,818.7	-221.0	4,813.9	0.00
9,700.0	92.24	90.00	4,918.6	-221.0	4,913.8	0.00

Energen APD Report

Company: Energen Resources
Project: Carson National Forest
Site: 22B; T32N R4W
Well: Carracas Unit #508H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Site 22B, T32N R4W
TVD Reference: WELL @ 6724.0usft (Original Well Elev)
MD Reference: WELL @ 6724.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)
9,800.0	92.24	90.00	5,018.5	-221.0	5,013.7	0.00
9,900.0	92.24	90.00	5,118.3	-221.0	5,113.7	0.00
10,000.0	92.24	90.00	5,218.2	-221.0	5,213.6	0.00
10,100.0	92.24	90.00	5,318.0	-221.0	5,313.5	0.00
10,200.0	92.24	90.00	5,417.9	-221.0	5,413.4	0.00
10,300.0	92.24	90.00	5,517.7	-221.0	5,513.3	0.00
10,400.0	92.24	90.00	5,617.6	-221.0	5,613.3	0.00
10,500.0	92.24	90.00	5,717.5	-221.0	5,713.2	0.00
10,600.0	92.24	90.00	5,817.3	-221.0	5,813.1	0.00
10,700.0	92.24	90.00	5,917.2	-221.0	5,913.0	0.00
10,800.0	92.24	90.00	6,017.0	-221.0	6,013.0	0.00
10,845.0	92.24	90.00	6,062.0	-221.0	6,057.9	0.00
4 1/2"						
10,847.1	92.24	90.00	6,064.0	-221.0	6,060.0	0.00
508BHL						

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
400.0	400.0	9 5/8"	9-5/8	12-1/4
5,800.0	5,168.8	7"	7	8-3/4
10,845.0	4,972.1	4 1/2"	4-1/2	6-1/4

Energen APD Report

Company: Energen Resources
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Local Co-ordinate Reference: Site 22B; T32N R4W
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North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Formations

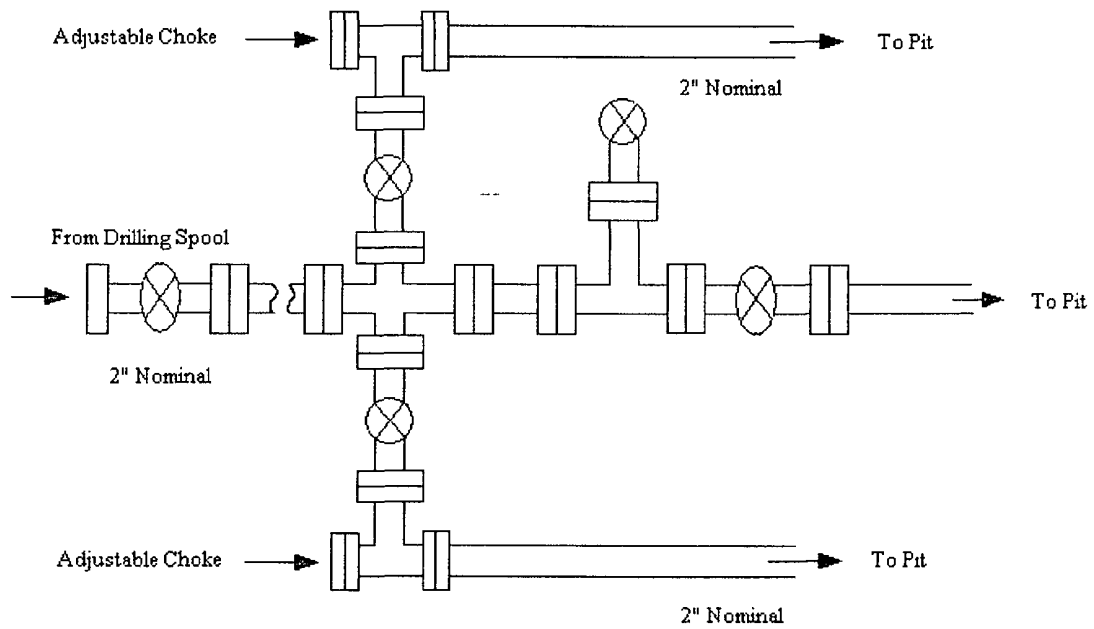
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,698.0	3,698.0	Pictured Cliffs	sandstone	0.00	
3,698.0	3,698.0	Pictured Cliffs	Sandstone	0.00	
3,932.0	3,932.0	Lewis	shale	0.00	
3,932.0	3,932.0	Lewis	Shale	0.00	
4,853.6	4,800.0	Huefanito Bentonite	bentonite	0.00	
3,280.0	3,280.0	Fruitland	sandstone	0.00	
3,280.0	3,280.0	Fruitland	Sandstone	0.00	
3,177.0	3,177.0	Kirtland	shale	0.00	
3,177.0	3,177.0	Kirtland	Shale	0.00	
5,100.3	4,972.0	Navajo City Top	shale	0.00	
5,100.3	4,972.0	Navajo City Top	Shale	0.00	
1,823.0	1,823.0	Nacimiento	shale	0.00	
1,823.0	1,823.0	Nacimiento	Shale	0.00	
3,620.0	3,620.0	Fruitland Coal	coal	0.00	
3,620.0	3,620.0	Fruitland Coal	Coal	0.00	
3,035.0	3,035.0	Ojo Alamo	sandstone	0.00	
3,035.0	3,035.0	Ojo Alamo	Sandstone	0.00	
5,694.7	5,170.0	Navajo City Base	shale	0.00	
5,694.7	5,170.0	Navajo City Base	Shale	0.00	

Checked By: _____

Approved By: _____

Date: _____

Energen Resources Corporation
Typical 2000 psi Choke Manifold Configuration



Choke manifold installed from surface to TD

Energen Resources Corporation

Typical BOP Configuration for Gas Drilling

