

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-4 or 3160-5 form.

Operator Signature Date: June 13, 2014

Application Type:

☐ P&A ☐ Drilling/Casing Change ☐ Recomplete/DHC
☐ Location Change ☒ Other: Horizontal plan correction

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E	Feet	NS	Ft	EW
30-043-21234-00-00	CHACON JICARILLA	602H	ENERGEN RESOURCES CORPORATION	O	N	Sandoval	J	M	23	23	N	3	W	861	S	802	W

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations

Hold C-104 for as drilled plat and directional survey

NMOCD Approved by Signature

7-3-14
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

RECEIVED

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.

SUBMIT IN TRIPLICATE - Other instructions on page 2 of Land Management

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. Jicarilla Apache 183
2. Name of Operator Energen Resources Corporation		6. If Indian, Allottee or Tribe Name Jicarilla Apache
3a. Address 2010 Afton Place, Farmington, NM 87401	3b. Phone No. (include area code) (505) 325-6800	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 861' FSL 802' FWL Sec. 23 T23N R03W (M) SW/SW		8. Well Name and No. Chacon Jicarilla 602H
		9. API Well No. 30-043-21234
		10. Field and Pool, or Exploratory Area West Lindrith Gallup Dakota
		11. County or Parish, State Sandoval NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ 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 has revised the drilling plans for the Chacon Jicarilla #602H. Please see the attached.

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

OIL CONS. DIV DIST. 3
JUL 03 2014

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

14. I hereby certify that the foregoing is true and correct Name (Printed/Typed) Anna Stotts	Title Regulatory Analyst
Signature <i>Anna Stotts</i>	Date 06/13/13 2014

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>William Tambekou</i>	Title <i>Petroleum Engineer</i>	Date 6/30/2014
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 FFD

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.

NMOCDA

Drilling Plan
Energen Resources Corporation
Revised 6/12/14

Chacon Jicarilla #602H

Surface Location: 861 FSL, 802 FWL

Legal Description: Sec 23, T23N, R3W (36.20425° N, 107.13233° W – NAD83)

Bottom Hole Location: 790 FSL, 200 FWL

Legal Description: Sec 22, T23N, R3W (36.20405° N, 107.15217° W – NAD83)

Sandoval, NM

1. The elevation of the unprepared ground is 7,457 feet above sea level.
2. The geological name of the surface formation is the San Jose
3. A rotary rig will be used to drill the well to a Proposed Total Depth of 6,540' TVD/11,965' MD.
4. Estimated top of important geological markers:

<u>Formation</u>	<u>Depth (TVD) (ft)</u>	<u>Depth (MD) (ft)</u>
San Jose	Surface	Surface
Nacimiento	2,940	2,940
Ojo Alamo	2,720	2,720
Kirtland	2,800	2,800
Fruitland	2,870	2,870
Pictured Cliffs	3,120	3,120
Huerfano Bentonite	3,450	3,450
Chacra	3,945	3,945
Cliff House	4,640	4,640
Menefee	4,685	4,685
Point Lookout	5,220	5,220
Mancos	5,530	5,530
Mancos/Niobrara "C"	6,460	6,711
Total Depth	6,540	11,965

5. Estimated depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered:

<u>Formation</u>	<u>Depth (TVD)(ft)</u>	<u>Water/HydroCarbon</u>
Fruitland	2,870	Gas
Pictured Cliffs	3,120	Gas
Cliffhouse	4,640	Gas
Point Lookout	5,220	Gas
Mancos	5,530	Oil/Gas

6. All proposed casing is new and the program is as follows:

Casing	Size	Depth		Grade	Weight	Connection	PSI		x1000 lbs
		MD	TVD				Burst	Collapse	Tension
Surface	13-3/8"	0-600	0-600	H-40	48.00	STC	1730	770	541
Intermediate	9-5/8"	0-5,600'	0-5,600'	L-80	43.50	LTC	6330	3810	1005
Tie-Back	7"	5,450-7,200'	5,450-6,540'	J-55	26.00	LTC	4980	4320	367
Production	4-1/2"	7,050'-11,960'	6,540'	P-110	11.60	LTC	10690	7560	279

7. Cementing Program:

- a. 17-1/2" hole x 13-3/8" casing at 600' will have cement circulated to surface with 615 sks (100% excess true hole) Class H Cement with 1.0 % CaCl₂, 1/2 #/sk Poly-E-Flake 15.8 ppg, 1.17 ft³/sk. Note: CEMENT MUST BE CIRCULATED TO SURFACE. STANDARD BOW SPRING CENTRALIZERS SHALL BE PLACED ON THE FIRST 3 (BOTTOM 3) JOINTS OF CASING (1 PER JOINT) AND 1 EVERY 3RD JOINT TO SURFACE. 20 BBLs OF WATER FOLLOWED BY 20 BBLs OF MUDFLUSH AHEAD OF CEMENT AS SPACER
- b. 12-1/4" hole x 9-5/8" casing at 5,600'. Cement will be circulated to surface and off a stage tool with 1230 sks (50% excess true hole) of HLC with 1.0 % CaCl₂, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal (Gilsonite) – 12.3 ppg, 1.95 ft³/sk followed by 230 sks (100% excess true hole) 50/50 Glass H/Poz with 0.15% Versaset, 0.30% HALAD-9, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.31 ft³/sk. CIRCULATE 4 HOURS BETWEEN STAGES ONCE PLUG IS LANDED ON FIRST STAGE. ONE CENTRALIZER PER JOINT FOR THE FIRST 3 JOINTS, THEN EVERY 3RD JOINT TO SURFACE. 10 BBLs OF WATER FOLLOWED BY 30 BBLs OF MUDFLUSH AHEAD OF CEMENT AS SPACER FOR EACH STAGE. MULTI-STAGE COLLAR TO BE PLACED 50' INTO KIRTLAND FMN, OR APPROX 2,850'.
- c. 8-3/4" hole x 7" casing at 7,200'. Cement will be circulated to top of liner overlap with 300 sks (50% excess true hole) 50/50 Glass H/Poz with 0.15% Versaset, 0.30% HALAD-9, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.31 ft³/sk. ONE CENTRALIZER PER JOINT FOR THE FIRST 3 JOINTS, THEN EVERY 3RD JOINT TO BOTTOM OF INTERMEDIATE CASING THEN 1 PER JOINT TO THE LINER HANGER. 10 BBLs OF WATER FOLLOWED BY 30 BBLs OF MUDFLUSH AHEAD OF CEMENT AS SPACER.
- d. 6-1/4" hole x 4-1/2" liner at 11,960'. A fluid caliper will be run to determine base slurry cement to have TOC at 5,794'. Weighted Reactive Spacer to invert oil phase mud: 40 bbls Tuned Spacer with 0.20 gal/bbl Musol® A Solvent, 146.5 lb/bbl Barite, 0.20 gal/bbl SEM-7 Surfactant. Base slurry to consist of 375 sks 50/50 Class H/Poz with 0.10% Versaset, 1.5 gal/sk CHEM-FOAMER 760, 0.10% sa-1015, 0.20% HALAD-766 – 13.5 ppg, 1.27 ft³/sk, Foamed density 10.5 ppg. 50 sks of base slurry to be used as tail cement less foaming agent. CENTRALIZERS TO BE USED AT DISCRETION IN LATERAL TO ACHIEVE 70% STAND OFF. CENTRALIZERS TO BE USED TO TIE BACK DEPTH OF 7050' TO ACHIEVE 70% STAND OFF. PACKOFF SEAL ASSEMBLY TO BE USED FOR LINER TOP ISOLATION. ALL PERFORATED INTERVALS SHALL BE CONTAINED WITHIN THE 330' SETBACK REQUIREMENTS.

8. Pressure Control Equipment

- a. Pressure control equipment will be used to meet 2,000 (2M) psi specifications.
- b. BOPE working pressure of 3,000 psi.
- c. Function test and visual inspection to be done at each casing size change prior to drill out.
- d. BOP annular to be tested to 50 % minimum of working pressure.
- e. Blind and Pipe Rams to be tested to 100 % working pressure.
- f. BOP to be installed prior to Surface Casing drillout.
- g. All BOP testing to conform with Onshore Order No. 2.
- h. BOP remote controls to be located on rig floor and readily accessible, master control on ground at accumulator will be able to function all preventors.
- i. Kill line will be 2 in min and have two kill line valves, one being a check valve.
- j. Choke line will be 2 in min and have two choke line valves, choke manifold with have two adjustable chokes, one manual and one remote.
- k. Float sub and TIW valve will be on the rig floor at all times.

9. Mud Program:

0' - 600'	Fresh water/Spud Mud. Paper for losses and seepage. 8.5 to 9.0 ppg, 32 to 75 vis, PV 3 to 5, YP 5 to 7, WL NC
600' - 7,200'	Fresh water/LSND. As needed LCM for losses and seepage. 8.5 to 9.5 ppg, pH 10, 28 to 60 vis, PV 1, YP 1, WL 8-15
7,200' - 11,965'	Brine water/LSND with clay and shale stabilizers. As needed LCM for losses and seepage. 8.3 to 9.3 ppg, 15 to 35 vis, PV 4-6, YP 4-6, WL < 20

****During drilling operations, all necessary products will be sufficiently stored on location for abnormal situations. The characteristics, use, testing of drilling mud and the implementation of related drilling procedures shall be designed to prevent the loss of well control. Sufficient quantities of mud materials shall be maintained or readily accessible for the purpose of assuring well control.**

****A pH of 10 or above in the fresh water base mud system shall be maintained to control the effects corrosion has on metallurgy of equipment used.**

Operating and Maintenance

Energen Resources Corporation will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. All leaks should be kept to less than 5 barrels. Rig crews will monitor the tanks at all times. A trip/surge tank will be used to monitor returns for any "kicks" of formation fluids.

Equipment:

2-Mongoose Shale Shakers

2-3400 High Speed Centrifuges with stands and pumps

2-Roll off bins with Tracks

2-200 bbl Open top Frac tanks

1-Mud/Gas Separator and Degasser

1-Trip/Surge Tank

Electronic or Visual monitoring system to indicate lost returns

10. Testing, Logging and Coring Program:

- a. Testing Program: No drillstem tests are anticipated
- b. Electric Logging Program: TBD
- c. LWD Program: TBD
- d. Coring Program: None.

11. Bottom Hole Pressure expected to be 2,500 +/- psi

12. Bottom Hole Temperature expected to be 160 deg F.

Energen Resources

Chacon Jicarilla

Mancos Shale

Chacon Jicarilla #602H

Plan #1

Plan: Copy of Preliminary Design

Preliminary Design

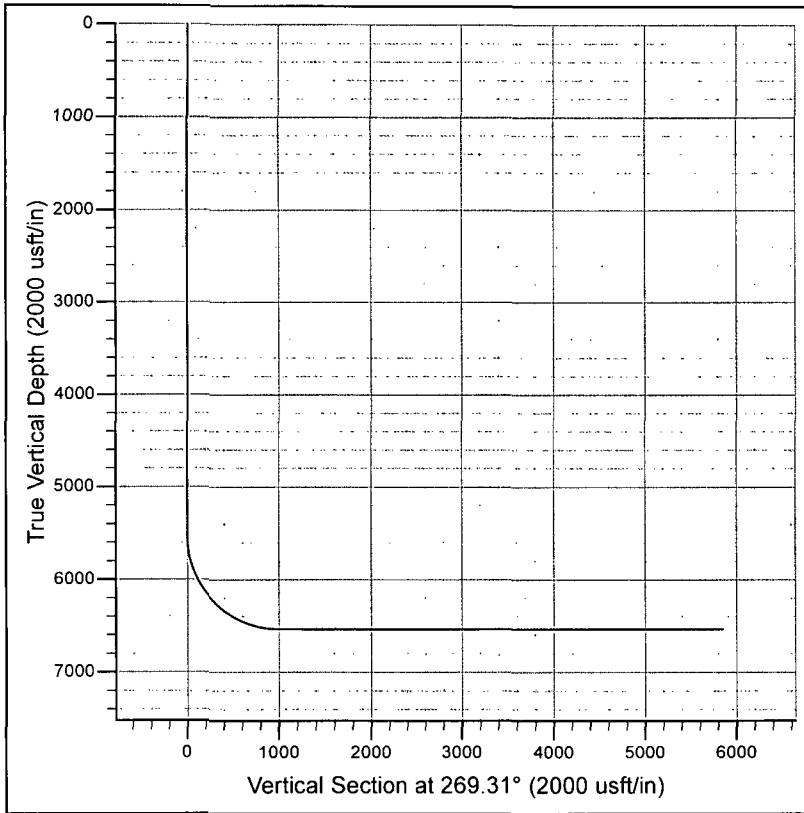
12 June, 2014



Company Name: Energen Resources

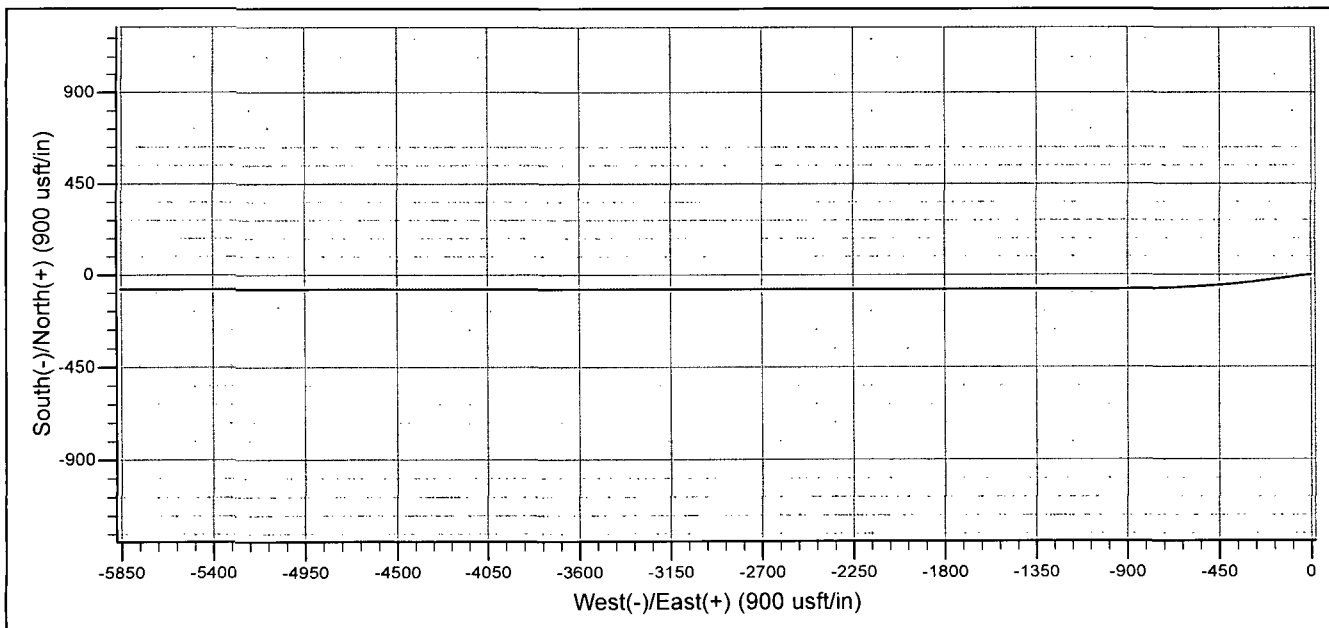
Project: Chacon Jicarilla
 Site: Mancos Shale
 Well: Chacon Jicarilla #602H
 Wellbore: Plan #1
 Design: Copy of Preliminary Design

Revised 6/12/14



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	5536.0	0.00	0.00	5536.0	0.0	0.0	0.00	0.00	0.0
3	6271.7	42.45	262.79	6206.2	-32.7	-258.2	5.77	262.79	258.6
4	6283.1	42.45	262.79	6214.6	-33.6	-265.9	0.00	0.00	266.2
5	7112.8	90.00	270.00	6540.0	-71.0	-1002.0	5.78	9.73	1002.8
6	11965.8	90.00	270.00	6540.0	-71.0	-5855.0	0.00	0.00	5855.4



Energen

Preliminary Design

Company:	Energen Resources	Local Co-ordinate Reference:	Site Mancos Shale
Project:	Chacon Jicarilla	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Mancos Shale	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Chacon Jicarilla #602H	North Reference:	Grid
Wellbore:	Plan #1	Survey Calculation Method:	Minimum Curvature
Design:	Copy of Preliminary Design	Database:	EDM 5000.1 Single User Db

Project	Chacon Jicarilla		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Mancos Shale				
Site Position:		Northing:	1,894,796.89 usft	Latitude:	36° 12' 15.300 N
From:	Lat/Long	Easting:	1,380,110.42 usft	Longitude:	107° 7' 56.388 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.52 °

Well	Chacon Jicarilla #602H					
Well Position	+N/-S	0.0 usft	Northing:	1,894,796.89 usft	Latitude:	36° 12' 15.300 N
	+E/-W	0.0 usft	Easting:	1,380,110.42 usft	Longitude:	107° 7' 56.388 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore	Plan #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	3/25/2014	9.21	63.08	50,332

Design	Copy of Preliminary Design			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	269.31

Survey Tool Program	Date 6/12/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	11,965.8	Copy of Preliminary Design (Plan #1)	MWD	MWD - Standard

Planned Survey								
TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)	
0.0	0.0	0.00	0.00	0.0	0.0	0.00		0.0
San Jose								
100.0	100.0	0.00	0.00	0.0	0.0	0.00		0.0
200.0	200.0	0.00	0.00	0.0	0.0	0.00		0.0
300.0	300.0	0.00	0.00	0.0	0.0	0.00		0.0
400.0	400.0	0.00	0.00	0.0	0.0	0.00		0.0
500.0	500.0	0.00	0.00	0.0	0.0	0.00		0.0
600.0	600.0	0.00	0.00	0.0	0.0	0.00		0.0
13.3/8"								
700.0	700.0	0.00	0.00	0.0	0.0	0.00		0.0
800.0	800.0	0.00	0.00	0.0	0.0	0.00		0.0
900.0	900.0	0.00	0.00	0.0	0.0	0.00		0.0

Energen

Preliminary Design

Company:	Energen Resources	Local Co-ordinate Reference:	Site Mancos Shale
Project:	Chacon Jicarilla	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Mancos Shale	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Chacon Jicarilla #602H	North Reference:	Grid
Wellbore:	Plan #1	Survey Calculation Method:	Minimum Curvature
Design:	Copy of Preliminary Design	Database:	EDM 5000.1 Single User Db

Planned Survey							
TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)
1,000.0	1,000.0	0.00	0.00	0.0	0.0	0.00	0.0
1,100.0	1,100.0	0.00	0.00	0.0	0.0	0.00	0.0
1,200.0	1,200.0	0.00	0.00	0.0	0.0	0.00	0.0
1,300.0	1,300.0	0.00	0.00	0.0	0.0	0.00	0.0
1,400.0	1,400.0	0.00	0.00	0.0	0.0	0.00	0.0
1,500.0	1,500.0	0.00	0.00	0.0	0.0	0.00	0.0
1,600.0	1,600.0	0.00	0.00	0.0	0.0	0.00	0.0
1,700.0	1,700.0	0.00	0.00	0.0	0.0	0.00	0.0
1,800.0	1,800.0	0.00	0.00	0.0	0.0	0.00	0.0
1,900.0	1,900.0	0.00	0.00	0.0	0.0	0.00	0.0
2,000.0	2,000.0	0.00	0.00	0.0	0.0	0.00	0.0
2,100.0	2,100.0	0.00	0.00	0.0	0.0	0.00	0.0
2,200.0	2,200.0	0.00	0.00	0.0	0.0	0.00	0.0
2,300.0	2,300.0	0.00	0.00	0.0	0.0	0.00	0.0
2,400.0	2,400.0	0.00	0.00	0.0	0.0	0.00	0.0
2,500.0	2,500.0	0.00	0.00	0.0	0.0	0.00	0.0
2,600.0	2,600.0	0.00	0.00	0.0	0.0	0.00	0.0
2,700.0	2,700.0	0.00	0.00	0.0	0.0	0.00	0.0
2,720.0	2,720.0	0.00	0.00	0.0	0.0	0.00	0.0
Ojo Alamo							
2,800.0	2,800.0	0.00	0.00	0.0	0.0	0.00	0.0
Kirtland							
2,870.0	2,870.0	0.00	0.00	0.0	0.0	0.00	0.0
Fruitland							
2,900.0	2,900.0	0.00	0.00	0.0	0.0	0.00	0.0
2,940.0	2,940.0	0.00	0.00	0.0	0.0	0.00	0.0
Nacimiento							
3,000.0	3,000.0	0.00	0.00	0.0	0.0	0.00	0.0
3,100.0	3,100.0	0.00	0.00	0.0	0.0	0.00	0.0
3,120.0	3,120.0	0.00	0.00	0.0	0.0	0.00	0.0
Pictured Cliffs							
3,200.0	3,200.0	0.00	0.00	0.0	0.0	0.00	0.0
3,300.0	3,300.0	0.00	0.00	0.0	0.0	0.00	0.0
3,400.0	3,400.0	0.00	0.00	0.0	0.0	0.00	0.0
3,450.0	3,450.0	0.00	0.00	0.0	0.0	0.00	0.0
Huerfanito Bentonite							
3,500.0	3,500.0	0.00	0.00	0.0	0.0	0.00	0.0
3,600.0	3,600.0	0.00	0.00	0.0	0.0	0.00	0.0
3,700.0	3,700.0	0.00	0.00	0.0	0.0	0.00	0.0
3,800.0	3,800.0	0.00	0.00	0.0	0.0	0.00	0.0
3,900.0	3,900.0	0.00	0.00	0.0	0.0	0.00	0.0
3,945.0	3,945.0	0.00	0.00	0.0	0.0	0.00	0.0
Chacra							
4,000.0	4,000.0	0.00	0.00	0.0	0.0	0.00	0.0
4,100.0	4,100.0	0.00	0.00	0.0	0.0	0.00	0.0

Energen

Preliminary Design

Company:	Energen Resources	Local Co-ordinate Reference:	Site Mancos Shale
Project:	Chacon Jicarilla	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Mancos Shale	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Chacon Jicarilla #602H	North Reference:	Grid
Wellbore:	Plan #1	Survey Calculation Method:	Minimum Curvature
Design:	Copy of Preliminary Design	Database:	EDM 5000.1 Single User Db

Planned Survey								
TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)	
4,200.0	4,200.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,300.0	4,300.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,400.0	4,400.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,500.0	4,500.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,600.0	4,600.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,640.0	4,640.0	0.00	0.00	0.0	0.0	0.00	0.0	
Cliff House								
4,685.0	4,685.0	0.00	0.00	0.0	0.0	0.00	0.0	
Menefee								
4,700.0	4,700.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,800.0	4,800.0	0.00	0.00	0.0	0.0	0.00	0.0	
4,900.0	4,900.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,000.0	5,000.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,100.0	5,100.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,200.0	5,200.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,220.0	5,220.0	0.00	0.00	0.0	0.0	0.00	0.0	
Point Lookout								
5,300.0	5,300.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,400.0	5,400.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,500.0	5,500.0	0.00	0.00	0.0	0.0	0.00	0.0	
5,530.0	5,530.0	0.00	0.00	0.0	0.0	0.00	0.0	
Mancos								
5,536.0	5,536.0	0.00	0.00	0.0	0.0	0.00	0.0	
KOP								
5,550.0	5,550.0	0.81	262.79	0.0	-0.1	5.77	0.1	
5,600.0	5,600.0	3.69	262.79	-0.3	-2.0	5.76	2.1	
9 5/8"								
5,649.7	5,650.0	6.58	262.79	-0.8	-6.5	5.77	6.5	
5,699.3	5,700.0	9.46	262.79	-1.7	-13.4	5.77	13.4	
5,748.3	5,750.0	12.35	262.79	-2.9	-22.8	5.77	22.8	
5,796.9	5,800.0	15.23	262.79	-4.4	-34.6	5.77	34.7	
5,844.8	5,850.0	18.12	262.79	-6.2	-48.8	5.77	48.9	
5,891.9	5,900.0	21.00	262.79	-8.3	-65.4	5.77	65.5	
5,938.1	5,950.0	23.89	262.79	-10.7	-84.4	5.77	84.5	
5,983.3	6,000.0	26.77	262.79	-13.4	-105.6	5.77	105.8	
6,027.4	6,050.0	29.66	262.79	-16.3	-129.0	5.77	129.2	
6,070.2	6,100.0	32.54	262.79	-19.6	-154.7	5.77	154.9	
6,111.6	6,150.0	35.43	262.79	-23.1	-182.4	5.77	182.7	
6,151.6	6,200.0	38.31	262.79	-26.8	-212.1	5.77	212.5	
6,190.1	6,250.0	41.19	262.79	-30.9	-243.9	5.77	244.2	
6,206.2	6,271.7	42.45	262.79	-32.7	-258.2	5.77	258.6	
6,214.6	6,283.1	42.45	262.79	-33.6	-265.9	0.00	266.2	
6,227.0	6,300.0	43.41	263.03	-35.1	-277.3	5.70	277.7	
6,262.5	6,350.0	46.26	263.69	-39.1	-312.3	5.70	312.7	
6,296.1	6,400.0	49.12	264.30	-43.0	-349.1	5.71	349.6	

Energen

Preliminary Design

Company:	Energen Resources	Local Co-ordinate Reference:	Site Mancos Shale
Project:	Chacon Jicarilla	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Mancos Shale	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Chacon Jicarilla #602H	North Reference:	Grid
Wellbore:	Plan #1	Survey Calculation Method:	Minimum Curvature
Design:	Copy of Preliminary Design	Database:	EDM 5000.1 Single User Db

Planned Survey							
TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)
6,327.9	6,450.0	51.98	264.85	-46.6	-387.5	5.72	388.0
6,357.7	6,500.0	54.84	265.36	-50.1	-427.5	5.72	428.1
6,385.5	6,550.0	57.70	265.84	-53.3	-468.9	5.73	469.5
6,411.1	6,600.0	60.57	266.29	-56.2	-511.8	5.73	512.4
6,434.6	6,650.0	63.43	266.71	-58.9	-555.8	5.73	556.5
6,455.8	6,700.0	66.30	267.11	-61.3	-601.0	5.73	601.7
6,460.0	6,710.6	66.90	267.19	-61.8	-610.7	5.74	611.4
Mancos/Niobrara "C"							
6,474.8	6,750.0	69.17	267.50	-63.5	-647.2	5.74	647.9
6,491.4	6,800.0	72.04	267.87	-65.4	-694.3	5.74	695.1
6,505.6	6,850.0	74.91	268.23	-67.0	-742.2	5.74	743.0
6,517.4	6,900.0	77.78	268.57	-68.4	-790.8	5.74	791.6
6,526.7	6,950.0	80.65	268.92	-69.5	-839.9	5.74	840.7
6,533.6	7,000.0	83.52	269.25	-70.3	-889.4	5.74	890.2
6,538.0	7,050.0	86.39	269.59	-70.8	-939.2	5.74	940.0
6,539.9	7,100.0	89.26	269.92	-71.0	-989.2	5.74	990.0
6,540.0	7,112.8	90.00	270.00	-71.0	-1,002.0	5.74	1,002.8
Mancos/Niobrara "C" LP - EP							
6,540.0	7,200.0	90.00	270.00	-71.0	-1,089.2	0.00	1,090.0
7"							
6,540.0	7,300.0	90.00	270.00	-71.0	-1,189.2	0.00	1,189.9
6,540.0	7,400.0	90.00	270.00	-71.0	-1,289.2	0.00	1,289.9
6,540.0	7,500.0	90.00	270.00	-71.0	-1,389.2	0.00	1,389.9
6,540.0	7,600.0	90.00	270.00	-71.0	-1,489.2	0.00	1,489.9
6,540.0	7,700.0	90.00	270.00	-71.0	-1,589.2	0.00	1,589.9
6,540.0	7,800.0	90.00	270.00	-71.0	-1,689.2	0.00	1,689.9
6,540.0	7,900.0	90.00	270.00	-71.0	-1,789.2	0.00	1,789.9
6,540.0	8,000.0	90.00	270.00	-71.0	-1,889.2	0.00	1,889.9
6,540.0	8,100.0	90.00	270.00	-71.0	-1,989.2	0.00	1,989.9
6,540.0	8,200.0	90.00	270.00	-71.0	-2,089.2	0.00	2,089.9
6,540.0	8,300.0	90.00	270.00	-71.0	-2,189.2	0.00	2,189.9
6,540.0	8,400.0	90.00	270.00	-71.0	-2,289.2	0.00	2,289.9
6,540.0	8,500.0	90.00	270.00	-71.0	-2,389.2	0.00	2,389.9
6,540.0	8,600.0	90.00	270.00	-71.0	-2,489.2	0.00	2,489.8
6,540.0	8,700.0	90.00	270.00	-71.0	-2,589.2	0.00	2,589.8
6,540.0	8,800.0	90.00	270.00	-71.0	-2,689.2	0.00	2,689.8
6,540.0	8,900.0	90.00	270.00	-71.0	-2,789.2	0.00	2,789.8
6,540.0	9,000.0	90.00	270.00	-71.0	-2,889.2	0.00	2,889.8
6,540.0	9,100.0	90.00	270.00	-71.0	-2,989.2	0.00	2,989.8
6,540.0	9,200.0	90.00	270.00	-71.0	-3,089.2	0.00	3,089.8
6,540.0	9,300.0	90.00	270.00	-71.0	-3,189.2	0.00	3,189.8
6,540.0	9,400.0	90.00	270.00	-71.0	-3,289.2	0.00	3,289.8
6,540.0	9,500.0	90.00	270.00	-71.0	-3,389.2	0.00	3,389.8
6,540.0	9,600.0	90.00	270.00	-71.0	-3,489.2	0.00	3,489.8
6,540.0	9,700.0	90.00	270.00	-71.0	-3,589.2	0.00	3,589.8

Energen

Preliminary Design

Company:	Energen Resources	Local Co-ordinate Reference:	Site Mancos Shale
Project:	Chacon Jicarilla	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Mancos Shale	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Chacon Jicarilla #602H	North Reference:	Grid
Wellbore:	Plan #1	Survey Calculation Method:	Minimum Curvature
Design:	Copy of Preliminary Design	Database:	EDM 5000.1 Single User Db

Planned Survey

TVD (usft)	MD (usft)	Inc (°)	Azi (azimuth) (°)	N/S (usft)	E/W (usft)	Build (°/100usft)	V. Sec (usft)
6,540.0	9,800.0	90.00	270.00	-71.0	-3,689.2	0.00	3,689.8
6,540.0	9,900.0	90.00	270.00	-71.0	-3,789.2	0.00	3,789.8
6,540.0	10,000.0	90.00	270.00	-71.0	-3,889.2	0.00	3,889.7
6,540.0	10,100.0	90.00	270.00	-71.0	-3,989.2	0.00	3,989.7
6,540.0	10,200.0	90.00	270.00	-71.0	-4,089.2	0.00	4,089.7
6,540.0	10,300.0	90.00	270.00	-71.0	-4,189.2	0.00	4,189.7
6,540.0	10,400.0	90.00	270.00	-71.0	-4,289.2	0.00	4,289.7
6,540.0	10,500.0	90.00	270.00	-71.0	-4,389.2	0.00	4,389.7
6,540.0	10,600.0	90.00	270.00	-71.0	-4,489.2	0.00	4,489.7
6,540.0	10,700.0	90.00	270.00	-71.0	-4,589.2	0.00	4,589.7
6,540.0	10,800.0	90.00	270.00	-71.0	-4,689.2	0.00	4,689.7
6,540.0	10,900.0	90.00	270.00	-71.0	-4,789.2	0.00	4,789.7
6,540.0	11,000.0	90.00	270.00	-71.0	-4,889.2	0.00	4,889.7
6,540.0	11,100.0	90.00	270.00	-71.0	-4,989.2	0.00	4,989.7
6,540.0	11,200.0	90.00	270.00	-71.0	-5,089.2	0.00	5,089.7
6,540.0	11,300.0	90.00	270.00	-71.0	-5,189.2	0.00	5,189.7
6,540.0	11,400.0	90.00	270.00	-71.0	-5,289.2	0.00	5,289.6
6,540.0	11,500.0	90.00	270.00	-71.0	-5,389.2	0.00	5,389.6
6,540.0	11,600.0	90.00	270.00	-71.0	-5,489.2	0.00	5,489.6
6,540.0	11,700.0	90.00	270.00	-71.0	-5,589.2	0.00	5,589.6
6,540.0	11,800.0	90.00	270.00	-71.0	-5,689.2	0.00	5,689.6
6,540.0	11,900.0	90.00	270.00	-71.0	-5,789.2	0.00	5,789.6
6,540.0	11,960.0	90.00	270.00	-71.0	-5,849.2	0.00	5,849.6
4 1/2"							
6,540.0	11,965.8	90.00	270.00	-71.0	-5,855.0	0.00	5,855.4
TD Lateral							

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,200.0	6,540.0	7"	7	7-1/2
5,600.0	5,600.0	9 5/8"	9-5/8	12-1/4
600.0	600.0	13 3/8"	13-3/8	17-1/2
11,960.0	6,540.0	4 1/2"	4-1/2	6-1/4