

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

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
Farmington Field Office
Bureau 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. Chacon Jicarilla 602H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SHL - 861' FSL 802' FWL Sec. 23 T23N R03W (M) SW/SW BHL - 790' FSL 200' FWL Sec. 22 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 Resources would like to request the following changes to the drilling plans for the Chacon Jicarilla #602H.

Change Surface csg: From 13-3/8", H-40, 48# STC to 9-5/8", J-55, 36# LTC
Change Intermediate csg: From 9-5/8", L-80, 43.5# LTC to 7", L-80, 26#, DQX
Omit Tie-Back
Change Production csg: From 4-1/2", P-110, 11.6#, LTC to 4-1/2", P-110, 11.6# DQX

Attached are the new drilling plans depicting the changes along with the directional design.

OIL CONS. DIV DIST. 3

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

MAY 22 2015

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 05/11/15

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by Troy Salyers	Title PE	Date 5/18/2015
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.

NMOCD.V

Drilling Plan
Energen Resources Corporation
 Revised 5/11/15

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 6,592' TVD/12,025' 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	6,592	12,025

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		
		MD	TVD				Burst	Collapse	Tension
Surface	9-5/8"	0-350	0-350	J-55	36.0	LTC	3520	2020	394
Intermediate	7"	0-7,225'	0-5,492'	L-80	26.0	DQX Ultra	7240	5410	830
Production	4-1/2"	7,050'-12,025'	5,492' - 6,454'	P-110	11.60	DQX Ultra	10690	7560	367

7. Cementing Program:

- a. 12-1/4" hole x 9-5/8" casing at 350' will have cement circulated to surface with 185 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. 8-3/4" hole x 7" casing at 7,225'. Cement will be circulated to surface with 775 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 115 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. 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. Test Intermediate Casing to 1500 psi. Cement Additives Subject to Change Based on Wellbore Conditions and Cement Design Criteria
- c. 6-1/4" hole x 4-1/2" liner at 12,025'. A fluid caliper will be run to determine base slurry cement to have TOC at 6,750'. Base slurry to consist of 450 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 A DEPTH OF 7025' TO ACHIEVE 70% STAND OFF. PACKOFF SEAL ASSEMBLY TO BE USED FOR LINER TOP ISOLATION. Cement Additives Subject to Change Based on Wellbore Conditions and Cement Design Criteria. Liner to be Pressure Tested During Completion Operations.

8. Pressure Control Equipment

- a. BOPE to be installed prior to Surface Casing drillout.
- b. Pressure control equipment will be used to meet 2,000 (2M) psi specifications.
- c. BOPE working pressure of 3,000 psi.
- d. Function test and visual inspection to be done at each casing size change prior to drill out.
- e. BOP annular to be tested to 85% of working pressure.
- f. All BOP and related equipment will be tested in accordance with the requirements outlined in Onshore Order No. 2 and Notice to Operators dated May 27, 2005.
- g. 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.
- h. Kill line will be 2 in min and have two kill line valves, one being a check valve.
- i. 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. All choke lines will be as straight as possible. Any turns will be properly targeted using block and/or running tees. Choke line and manifold to be pressure tested to 1,500 psi.
- j. Float sub and TIW valve will be on the rig floor at all times.
- k. If high pressure co-flex hoses are used, they will be run as straight as possible and anchored to prevent whip.
- l. The main discharge line (panic line) will be at least 100' from the choke manifold and discharged into an appropriately sized discharge facility.

9. Mud Program:

0' - 350'	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
350' – 7,225'	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
7,225' – 12,025'	WBM with shale and clay 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. Any leaks, spills or other undesirable events will be reported in accordance with BLM NTL 3A. 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.
- e. CBL's and/or Temperature Surveys Will Be Performed as Needed or Required.

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 #2

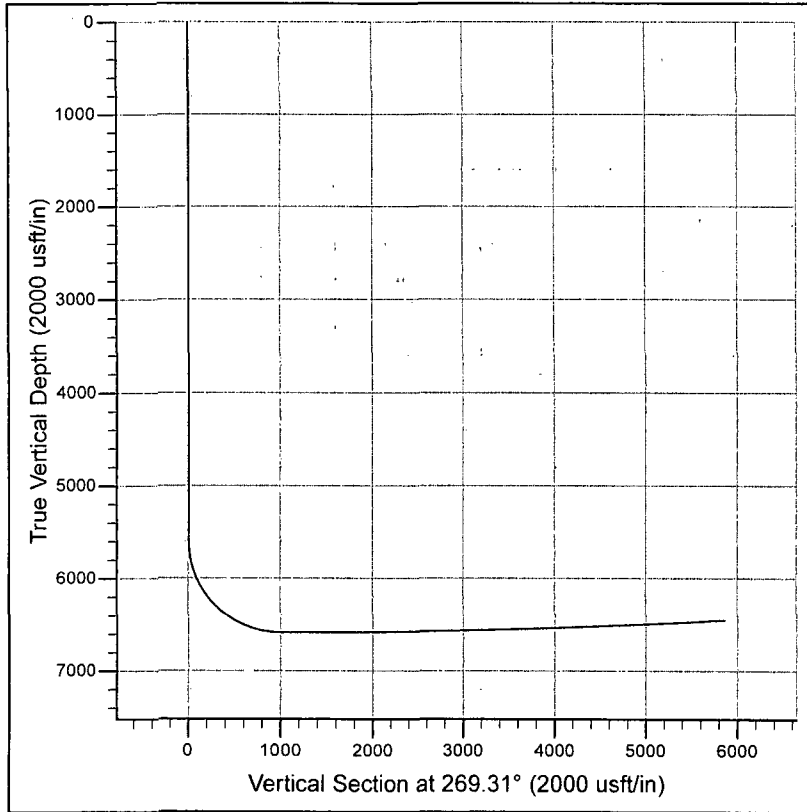
Plan: Design #1

Preliminary Design

11 May, 2015

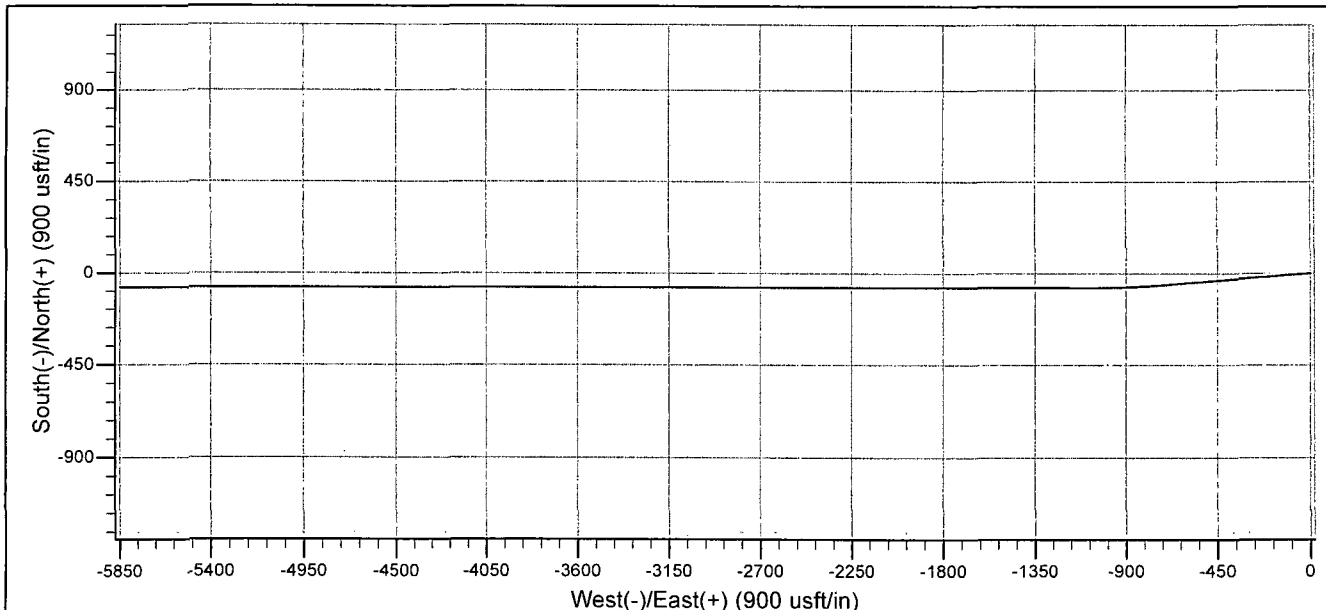
Company Name: Energen Resources

Project: Chacon Jicarilla
Site: Mancos Shale
Well: Chacon Jicarilla #602H
Wellbore: Plan #2
Design: Design #1



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	5600.0	0.00	0.00	5600.0	0.0	0.0	0.00	0.00	0.0
3	6949.5	78.06	265.44	6569.1	-62.4	-783.1	5.78	265.44	783.8
4	7170.2	90.00	270.00	6592.0	-71.0	-1002.0	5.78	21.06	1002.8
5	12025.2	93.25	270.00	6454.3	-71.0	-5854.4	0.07	0.00	5854.8



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 #2	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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 #2
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/1/2014	9.14	63.07	50,283

Design:	Design #1
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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 5/11/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	12,025.2	Design #1 (Plan #2)	MWD	MWD - Standard

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
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
350.0	350.0	0.00	0.00	0.0	0.0	0.00	0.0
Surface Casing							
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
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 #2	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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		0.0
1,100.0	1,100.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,200.0	1,200.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,300.0	1,300.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,400.0	1,400.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,500.0	1,500.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,600.0	1,600.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,700.0	1,700.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,800.0	1,800.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
1,900.0	1,900.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,000.0	2,000.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,100.0	2,100.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,200.0	2,200.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,300.0	2,300.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,400.0	2,400.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,500.0	2,500.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,600.0	2,600.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,700.0	2,700.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,800.0	2,800.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
2,900.0	2,900.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,000.0	3,000.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,100.0	3,100.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,200.0	3,200.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,300.0	3,300.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,400.0	3,400.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,500.0	3,500.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,600.0	3,600.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,700.0	3,700.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,800.0	3,800.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
3,900.0	3,900.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,000.0	4,000.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,100.0	4,100.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,200.0	4,200.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,300.0	4,300.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,400.0	4,400.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,500.0	4,500.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,600.0	4,600.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,700.0	4,700.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,800.0	4,800.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
4,900.0	4,900.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
5,000.0	5,000.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
5,100.0	5,100.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
5,200.0	5,200.0	0.00	0.00	0.0	0.0	0.00	0.0		0.0
5,300.0	5,300.0	0.00	0.00	0.0	0.0	0.00	0.0		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 #2	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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)
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
5,600.0	5,600.0	0.00	0.00	0.0	0.0	0.00	0.0
5,650.0	5,650.0	2.89	265.44	-0.1	-1.3	5.78	1.3
5,699.8	5,700.0	5.78	265.44	-0.4	-5.0	5.78	5.0
5,749.4	5,750.0	8.68	265.44	-0.9	-11.3	5.78	11.3
5,798.6	5,800.0	11.57	265.44	-1.6	-20.1	5.78	20.1
5,847.4	5,850.0	14.46	265.44	-2.5	-31.3	5.78	31.3
5,895.4	5,900.0	17.35	265.44	-3.6	-44.9	5.78	45.0
5,942.8	5,950.0	20.25	265.44	-4.9	-61.0	5.78	61.1
5,989.2	6,000.0	23.14	265.44	-6.3	-79.4	5.78	79.5
6,034.7	6,050.0	26.03	265.44	-8.0	-100.2	5.78	100.2
6,079.0	6,100.0	28.92	265.44	-9.8	-123.2	5.78	123.3
6,122.2	6,150.0	31.81	265.44	-11.8	-148.3	5.78	148.5
6,164.0	6,200.0	34.71	265.44	-14.0	-175.7	5.78	175.8
6,204.3	6,250.0	37.60	265.44	-16.3	-205.1	5.78	205.3
6,243.2	6,300.0	40.49	265.44	-18.8	-236.5	5.78	236.7
6,280.4	6,350.0	43.38	265.44	-21.5	-269.8	5.78	270.0
6,315.8	6,400.0	46.28	265.44	-24.3	-304.9	5.78	305.2
6,349.4	6,450.0	49.17	265.44	-27.2	-341.8	5.78	342.1
6,381.2	6,500.0	52.06	265.44	-30.3	-380.3	5.78	380.6
6,410.9	6,550.0	54.95	265.44	-33.5	-420.4	5.78	420.8
6,438.6	6,600.0	57.85	265.44	-36.8	-461.9	5.78	462.3
6,464.1	6,650.0	60.74	265.44	-40.2	-504.7	5.78	505.2
6,487.4	6,700.0	63.63	265.44	-43.7	-548.8	5.78	549.3
6,508.5	6,750.0	66.52	265.44	-47.3	-594.0	5.78	594.5
6,527.3	6,800.0	69.41	265.44	-51.0	-640.2	5.78	640.8
6,543.6	6,850.0	72.31	265.44	-54.8	-687.3	5.78	687.9
6,557.6	6,900.0	75.20	265.44	-58.6	-735.1	5.78	735.8
6,569.1	6,949.5	78.06	265.44	-62.4	-783.1	5.78	783.8
6,578.3	7,000.0	80.79	266.51	-65.9	-832.6	5.40	833.4
6,585.2	7,050.0	83.49	267.54	-68.4	-882.1	5.41	882.9
6,589.7	7,100.0	86.20	268.57	-70.1	-931.9	5.41	932.7
6,591.8	7,150.0	88.91	269.59	-70.9	-981.8	5.41	982.6
6,592.0	7,170.2	90.00	270.00	-71.0	-1,002.0	5.42	1,002.8
6,592.0	7,200.0	90.02	270.00	-71.0	-1,031.8	0.07	1,032.6
6,592.0	7,225.0	90.04	270.00	-71.0	-1,056.8	0.07	1,057.6
Intermediate Casing							
6,591.9	7,300.0	90.09	270.00	-71.0	-1,131.8	0.07	1,132.6
6,591.7	7,400.0	90.15	270.00	-71.0	-1,231.8	0.07	1,232.6
6,591.4	7,500.0	90.22	270.00	-71.0	-1,331.8	0.07	1,332.6
6,590.9	7,600.0	90.29	270.00	-71.0	-1,431.8	0.07	1,432.6
6,590.4	7,700.0	90.35	270.00	-71.0	-1,531.8	0.07	1,532.6
6,589.7	7,800.0	90.42	270.00	-71.0	-1,631.8	0.07	1,632.5
6,588.9	7,900.0	90.49	270.00	-71.0	-1,731.8	0.07	1,732.5

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 #2	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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)	
6,588.0	8,000.0	90.56	270.00	-71.0	-1,831.8	0.07	1,832.5	
6,586.9	8,100.0	90.62	270.00	-71.0	-1,931.8	0.07	1,932.5	
6,585.8	8,200.0	90.69	270.00	-71.0	-2,031.8	0.07	2,032.5	
6,584.5	8,300.0	90.76	270.00	-71.0	-2,131.8	0.07	2,132.5	
6,583.2	8,400.0	90.82	270.00	-71.0	-2,231.8	0.07	2,232.5	
6,581.7	8,500.0	90.89	270.00	-71.0	-2,331.8	0.07	2,332.4	
6,580.1	8,600.0	90.96	270.00	-71.0	-2,431.7	0.07	2,432.4	
6,578.3	8,700.0	91.02	270.00	-71.0	-2,531.7	0.07	2,532.4	
6,576.5	8,800.0	91.09	270.00	-71.0	-2,631.7	0.07	2,632.4	
6,574.5	8,900.0	91.16	270.00	-71.0	-2,731.7	0.07	2,732.4	
6,572.4	9,000.0	91.22	270.00	-71.0	-2,831.7	0.07	2,832.3	
6,570.2	9,100.0	91.29	270.00	-71.0	-2,931.6	0.07	2,932.3	
6,567.9	9,200.0	91.36	270.00	-71.0	-3,031.6	0.07	3,032.3	
6,565.5	9,300.0	91.43	270.00	-71.0	-3,131.6	0.07	3,132.2	
6,563.0	9,400.0	91.49	270.00	-71.0	-3,231.6	0.07	3,232.2	
6,560.3	9,500.0	91.56	270.00	-71.0	-3,331.5	0.07	3,332.1	
6,557.5	9,600.0	91.63	270.00	-71.0	-3,431.5	0.07	3,432.1	
6,554.6	9,700.0	91.69	270.00	-71.0	-3,531.4	0.07	3,532.0	
6,551.6	9,800.0	91.76	270.00	-71.0	-3,631.4	0.07	3,632.0	
6,548.5	9,900.0	91.83	270.00	-71.0	-3,731.3	0.07	3,731.9	
6,545.2	10,000.0	91.89	270.00	-71.0	-3,831.3	0.07	3,831.9	
6,541.9	10,100.0	91.96	270.00	-71.0	-3,931.2	0.07	3,931.8	
6,538.4	10,200.0	92.03	270.00	-71.0	-4,031.2	0.07	4,031.7	
6,534.8	10,300.0	92.10	270.00	-71.0	-4,131.1	0.07	4,131.7	
6,531.1	10,400.0	92.16	270.00	-71.0	-4,231.0	0.07	4,231.6	
6,527.2	10,500.0	92.23	270.00	-71.0	-4,331.0	0.07	4,331.5	
6,523.3	10,600.0	92.30	270.00	-71.0	-4,430.9	0.07	4,431.4	
6,519.2	10,700.0	92.36	270.00	-71.0	-4,530.8	0.07	4,531.3	
6,515.0	10,800.0	92.43	270.00	-71.0	-4,630.7	0.07	4,631.2	
6,510.7	10,900.0	92.50	270.00	-71.0	-4,730.6	0.07	4,731.1	
6,506.3	11,000.0	92.56	270.00	-71.0	-4,830.5	0.07	4,831.0	
6,501.8	11,100.0	92.63	270.00	-71.0	-4,930.4	0.07	4,930.9	
6,497.2	11,200.0	92.70	270.00	-71.0	-5,030.3	0.07	5,030.8	
6,492.4	11,300.0	92.76	270.00	-71.0	-5,130.2	0.07	5,130.7	
6,487.5	11,400.0	92.83	270.00	-71.0	-5,230.1	0.07	5,230.6	
6,482.5	11,500.0	92.90	270.00	-71.0	-5,330.0	0.07	5,330.4	
6,477.4	11,600.0	92.97	270.00	-71.0	-5,429.8	0.07	5,430.3	
6,472.2	11,700.0	93.03	270.00	-71.0	-5,529.7	0.07	5,530.2	
6,466.8	11,800.0	93.10	270.00	-71.0	-5,629.6	0.07	5,630.0	
6,461.3	11,900.0	93.17	270.00	-71.0	-5,729.4	0.07	5,729.8	
6,455.8	12,000.0	93.23	270.00	-71.0	-5,829.2	0.07	5,829.7	
6,454.4	12,025.0	93.25	270.00	-71.0	-5,854.2	0.07	5,854.6	
Production Liner								
6,454.3	12,025.2	93.25	270.00	-71.0	-5,854.4	0.07	5,854.8	

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 #2	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
350.0	350.0	Surface Casing	9-5/8	12-1/4	
7,225.0	6,592.0	Intermediate Casing	7	8-3/4	
12,025.0	6,454.4	Production Liner	4-1/2	6-1/8	

Checked By: _____	Approved By: _____	Date: _____
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