State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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

David R. Catanach 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 3160-3 APD form.

Operator Signature Date: 2-16-15
Well information;
Operator Energen, Well Name and Number Chaco 23 08 3 # 2H
API# 30-045-35646, Section 3, Township 23 (N/S), Range 08 (E/W)

Conditions of Approval:
(See the below checked and handwritten conditions)

- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Hold C-104 for directional survey & "As Drilled" Plat
- o Hold C-104 for NSL, NSP, DHC
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- o Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
  - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
  - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
  - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- o Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ✓ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ✓ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ✓ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Charlie T. Perrin
NMOCD Approved by Signature

10-13-2015
Date KC

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

RECEIVED

MAR 19 2015

Farmington Field Office
Bureau of Land Management

Form 3160-3
(August 2007)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM-18463

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
CHACO 23-08 3 #2H

2. Name of Operator ENERGEN RESOURCES CORPORATION

9. API Well No.
30-045-35646

3a. Address 2010 AFTON PLACE
FARMINGTON, NM 87401

3b. Phone No. *(include area code)*
505-325-6800

10. Field and Pool, or Exploratory
BASIN MANCOS

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface H 2119' FNL & 213' FEL, SEC 3, T23N, R8W
At proposed prod. zone E 2260' FNL & 380' FWL, SEC 3, T23N, R8W

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 3. T23N. R8W. NMPM

KP

14. Distance in miles and direction from nearest town or post office*
Approximately 4.5 miles southeast of the town of Nageezi, New Mexico

12. County or Parish
SAN JUAN COUNTY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No. of acres in lease	17. Spacing Unit dedicated to this well
213'	2243.16 ACRES	160 ACRES

OIL CONS. DIV DIST. 3

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. on file
127.5'	9,830' MD 5,446' TVD	NM2707 NMB000747

OCT 06 2015

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
GL: 6,910' (NAVD 88)	05/30/2015	45 DAYS

24. Attachments

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.
2. A Drilling Plan.
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).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
	DOUG THOMAS	2-12-15

Title
DRILLING SUPERINTENDENT

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
AFM	Office FFO	10/2/15

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)

*(Instructions on page 2)

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

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

NMOCD

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

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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 August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-045-35646	97232	BASIN MANCOS GAS

[4] Property Code	[5] Property Name	[6] Well Number
315301	CHACO 23-08-3	2H

[7] OGRID No.	[8] Operator Name	[9] Elevation
162928	ENERGEN RESOURCES CORPORATION	6910.5'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	WEST/West line	County
H	3	23N	8W		2119'	NORTH	213'	EAST	SAN JUAN

[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	WEST/West line	County
E	3	23N	8W		2260'	NORTH	380'	WEST	SAN JUAN

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
323.20 ACRES S/2 N/2, LOTS 1-4 PROJECT AREA			NSL-7246

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

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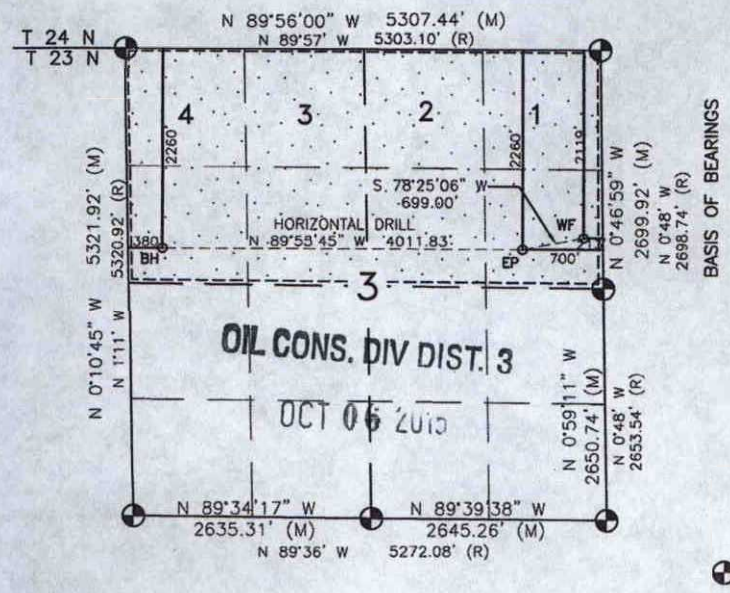
BOTTOM HOLE
LAT. 36.257364° N (NAD83)
LONG. 107.676793° W (NAD83)
LAT. 36.257351° N (NAD27)
LONG. 107.676182° W (NAD27)

ENTRY POINT
LAT. 36.257350° N (NAD83)
LONG. 107.663191° W (NAD83)
LAT. 36.257337° N (NAD27)
LONG. 107.662580° W (NAD27)

WELL FLAG
LAT. 36.257736° N (NAD83)
LONG. 107.660870° W (NAD83)
LAT. 36.257723° N (NAD27)
LONG. 107.660259° W (NAD27)



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[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.

Anna Stotts 2/26/15
Signature Date

Anna Stotts
Printed Name

astotts@energen.com
E-mail Address

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.

JULY 31, 2014
Date of Survey

Signature and Seal of Professional Surveyor:

DAVID R. RUSSELL NEW MEXICO 1020 REGISTERED PROFESSIONAL LAND SURVEYOR

DAVID RUSSELL
Certificate Number 10201

United States Department of the Interior
Bureau of Land Management

Access Road Plats

Energen Resources
Chaco 23-08 3 #2H Well Project

Prepared for

ENERGEN®

2010 Afton Place – Farmington, NM 87401
505-325-6800

Prepared by

tegre

1199 Main Avenue, Suite 101 – Durango, CO 81301
970-828-4732

U.S. Department of the Interior
Bureau of Land Management
Farmington District
Farmington Field Office
6251 N. College Blvd., Ste. A
Farmington, NM 87402
Phone: (505) 564-7600
FAX: (505) 564-7608

Drilling Plan
Energen Resources Corporation

Chaco 23-08 3 #002H
Surface Location: 2119 FNL, 213 FEL
Legal Description: Sec 3, T23N, R8W (36.257736° N, 107.660870° W – NAD83)
Bottom Hole Location: 2260 FNL, 380 FWL
Legal Description: Sec 3, T23N, R8W (36.257364° N, 107.676793° W – NAD83)
San Juan County, NM

1. The elevation of the unprepared ground is 6,911 feet above sea level.
2. The geological name of the surface formation is the Nacimiento.
3. A rotary rig will be used to drill the well to a Proposed Total Depth of 5,446' TVD/9,830' MD.
4. Estimated top of important geological markers:

Formation	Depth (TVD)(ft)	Depth (MD)(ft)
Nacimiento	Surface	Surface
Ojo Alamo	1,096	1,096
Kirtland	1,196	1,196
Fruitland	1,370	1,370
Pictured Cliffs	1,806	1,806
Huerfantio Bentonite	2,096	2,096
Chacra	2,571	2,571
Cliff House	3,286	3,286
Menefee	3,336	3,336
Point Lookout	4,191	4,191
Mancos	4,641	4,641
Mancos/Niobrara "C"	5,296	5,365

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

Formation	Depth (TVD)(ft)	Water/HydroCarbon
Fruitland	1,370	Gas
Pictured Cliffs	1,806	Gas
Cliffhouse	3,286	Gas
Point Lookout	4,191	Gas
Mancos	4,641	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	9-5/8"	0-500'	0-500'	J-55	36.00	STC	3520	2020	394
Intermediate	7"	0-5,900'	0-5,446'	J-55	26.00	LTC	4980	4320	367
Production	4-1/2"	5,750'-9,830'	5,306'	L-80	11.60	Ultra DQX	7780	6350	267

Cementing Program:

a. 12-1/4" hole x 9-5/8" casing at 500' will have cement circulated to surface with 270 sks (100% excess true hole) Class H Cement with 1.0 % $CaCl_2$, ½ #/sk Poly-E-Flake15.8 ppg, 1.17 ft^3/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. Test Surface Casing to 750 psi.

b. 8-3/4" hole x 7" casing at 5,900'. Cement will be circulated to surface with 625 sks (50% excess true hole) of HLC with 1.0 % $CaCl_2$. ¼ #/sk Poly-E-Flake, 5 #/sk Kol-Seal (Gilsonite) – 12.3 ppg, 1.95 ft^3/sk followed by 115 sks (100% excess true hole) 50/50 Glass H/Poz with 0.15% Versaset, 0.30% HALAD-9, ¼ #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.31 ft^3/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 9,830'. A fluid caliper will be run to determine base slurry cement to have TOC at 5,750'. 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 ft^3/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 6150' 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.

7. 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.

8. Mud Program:

0' - 500'	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
500' – 5,900'	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
5,900' – 9,830'	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

9. 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.

10. Bottom Hole Pressure expected to be 2,500 +/- psi
11. Bottom Hole Temperature expected to be 160 deg F.

Energen Resources

Chaco Mancos Sec 3, T23N, R8W
Chaco 23-8 3 #002H
Design #1
Preliminary Design

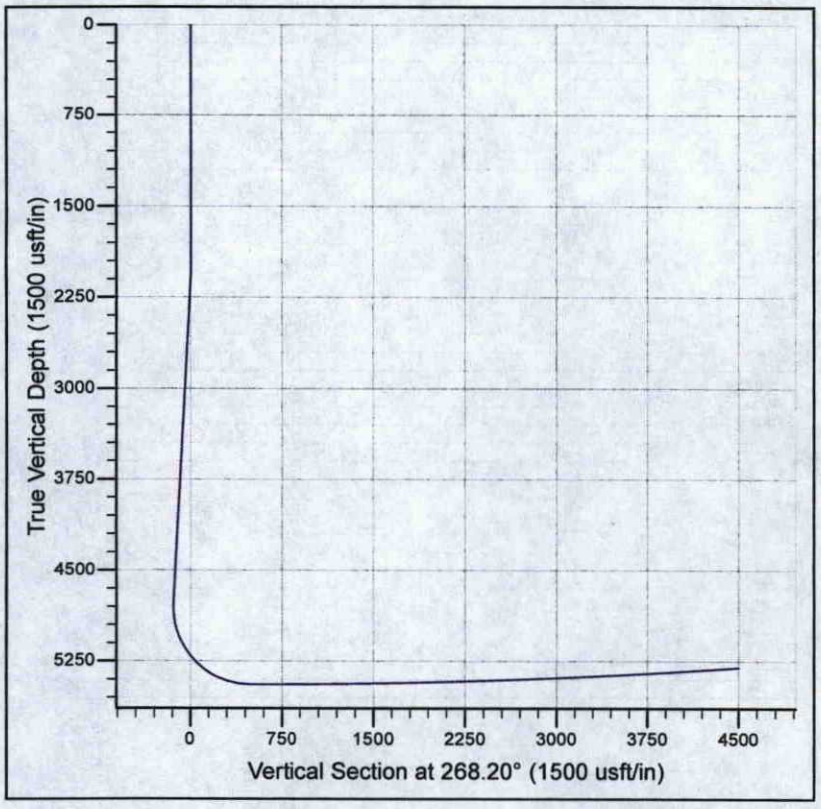
Plan: APD Plan

Preliminary Design

01 December, 2014

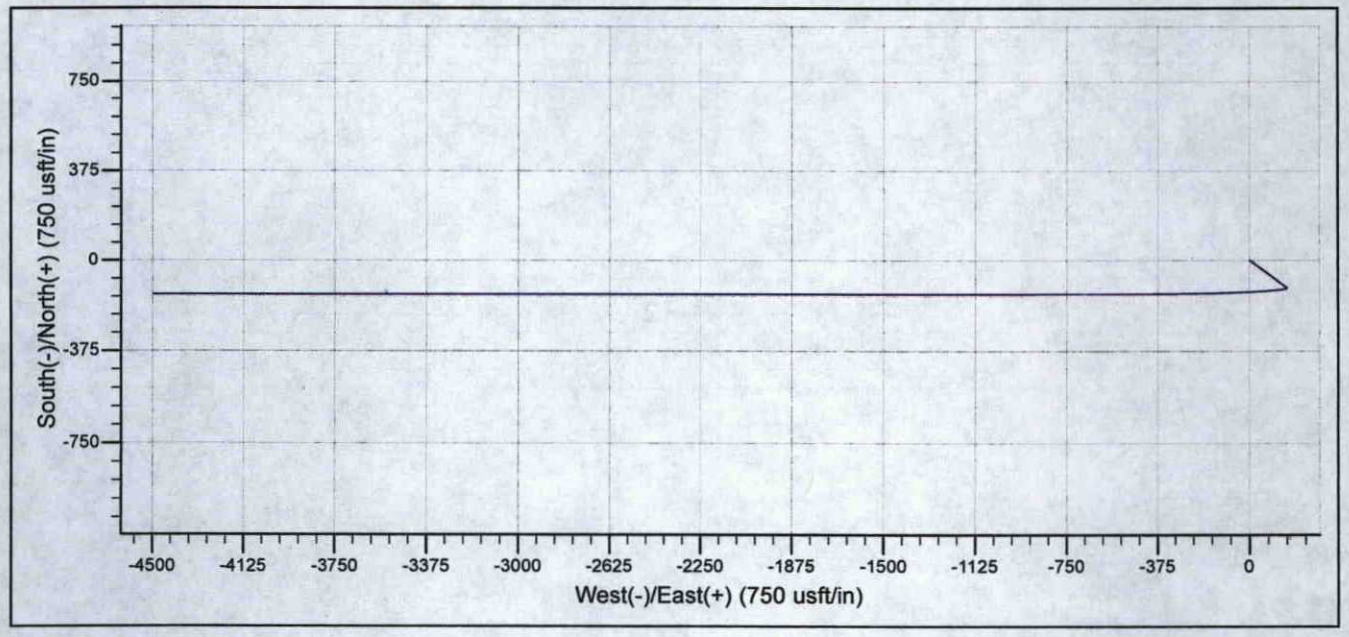
Company Name: Energen Resources

Project: Chaco Mancos Sec 3, T23N, R8W
Site: Chaco 23-8 3 #002H
Well: Design #1
Wellbore: Preliminary Design
Design: APD Plan



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	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0
3	2091.6	3.92	127.28	2091.6	-1.9	2.5	4.27	127.28	-2.4
4	4781.7	3.92	127.28	4775.4	-113.2	148.7	0.00	0.00	-145.1
5	5816.3	90.00	270.00	5446.0	-141.0	-487.0	9.00	142.65	491.2
6	9830.3	94.00	270.00	5305.9	-141.0	-4497.7	0.10	0.00	4499.9



Energen

Preliminary Design

Company:	Energen Resources	**Local Co-ordinate Reference:**	Site Chaco 23-8 3 #002H
Project:	Chaco Mancos Sec 3, T23N, R8W	**TVD Reference:**	WELL @ 0.0usft (Original Well Elev)
Site:	Chaco 23-8 3 #002H	**MD Reference:**	WELL @ 0.0usft (Original Well Elev)
Well:	Design #1	**North Reference:**	Grid
Wellbore:	Preliminary Design	**Survey Calculation Method:**	Minimum Curvature
Design:	APD Plan	**Database:**	EDM 5000.1 Single User Db

Project Chaco Mancos Sec 3, T23N, R8W

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site Chaco 23-8 3 #002H

Site Position:		**Northing:**	1,913,159.85 usft	**Latitude:**	36° 15' 27.850 N
From:	Lat/Long	**Easting:**	2,773,937.66 usft	**Longitude:**	107° 39' 39.132 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.10 °

Well Design #1

Well Position	**+N/-S**	0.0 usft	**Northing:**	1,913,159.85 usft	**Latitude:**	36° 15' 27.850 N
	+E/-W	0.0 usft	**Easting:**	2,773,937.66 usft	**Longitude:**	107° 39' 39.132 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	0.0 usft

Wellbore Preliminary Design

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/24/2014	9.36	63.01	50,233

Design APD Plan

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	268.20

Survey Tool Program **Date** 12/1/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	9,830.3	APD Plan (Preliminary Design)	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
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
Surface Casing							
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
1,000.0	1,000.0	0.00	0.00	0.0	0.0	0.00	0.0

Energen

Preliminary Design

Company:	Energen Resources	**Local Co-ordinate Reference:**	Site Chaco 23-8 3 #002H
Project:	Chaco Mancos Sec 3, T23N, R8W	**TVD Reference:**	WELL @ 0.0usft (Original Well Elev)
Site:	Chaco 23-8 3 #002H	**MD Reference:**	WELL @ 0.0usft (Original Well Elev)
Well:	Design #1	**North Reference:**	Grid
Wellbore:	Preliminary Design	**Survey Calculation Method:**	Minimum Curvature
Design:	APD Plan	**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)
1,100.0	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
2,091.6	2,091.6	3.92	127.28	-1.9	2.5	4.27	-2.4
2,099.9	2,100.0	3.92	127.28	-2.2	2.9	0.00	-2.9
2,199.7	2,200.0	3.92	127.28	-6.4	8.4	0.00	-8.2
2,299.4	2,300.0	3.92	127.28	-10.5	13.8	0.00	-13.5
2,399.2	2,400.0	3.92	127.28	-14.7	19.2	0.00	-18.8
2,499.0	2,500.0	3.92	127.28	-18.8	24.7	0.00	-24.1
2,598.7	2,600.0	3.92	127.28	-22.9	30.1	0.00	-29.4
2,698.5	2,700.0	3.92	127.28	-27.1	35.6	0.00	-34.7
2,798.3	2,800.0	3.92	127.28	-31.2	41.0	0.00	-40.0
2,898.0	2,900.0	3.92	127.28	-35.3	46.4	0.00	-45.3
2,997.8	3,000.0	3.92	127.28	-39.5	51.9	0.00	-50.6
3,097.6	3,100.0	3.92	127.28	-43.6	57.3	0.00	-55.9
3,197.3	3,200.0	3.92	127.28	-47.8	62.7	0.00	-61.2
3,297.1	3,300.0	3.92	127.28	-51.9	68.2	0.00	-66.5
3,396.9	3,400.0	3.92	127.28	-56.0	73.6	0.00	-71.8
3,496.6	3,500.0	3.92	127.28	-60.2	79.0	0.00	-77.1
3,596.4	3,600.0	3.92	127.28	-64.3	84.5	0.00	-82.4
3,696.2	3,700.0	3.92	127.28	-68.4	89.9	0.00	-87.7
3,795.9	3,800.0	3.92	127.28	-72.6	95.3	0.00	-93.0
3,895.7	3,900.0	3.92	127.28	-76.7	100.8	0.00	-98.3
3,995.5	4,000.0	3.92	127.28	-80.8	106.2	0.00	-103.6
4,095.2	4,100.0	3.92	127.28	-85.0	111.6	0.00	-108.9
4,195.0	4,200.0	3.92	127.28	-89.1	117.1	0.00	-114.2
4,294.8	4,300.0	3.92	127.28	-93.3	122.5	0.00	-119.5
4,394.5	4,400.0	3.92	127.28	-97.4	127.9	0.00	-124.8
4,494.3	4,500.0	3.92	127.28	-101.5	133.4	0.00	-130.1
4,594.1	4,600.0	3.92	127.28	-105.7	138.8	0.00	-135.4
4,693.8	4,700.0	3.92	127.28	-109.8	144.2	0.00	-140.7
4,775.4	4,781.7	3.92	127.28	-113.2	148.7	0.00	-145.1
4,793.6	4,800.0	2.79	148.24	-113.9	149.4	-6.15	-145.8
4,843.6	4,850.0	3.85	231.95	-116.0	148.7	2.11	-145.0
4,893.3	4,900.0	7.89	252.60	-118.1	144.1	8.09	-140.4
4,942.5	4,950.0	12.26	259.00	-120.1	135.6	8.73	-131.8
4,990.9	5,000.0	16.70	262.05	-122.1	123.3	8.87	-119.4

Energen

Preliminary Design

Company:	Energen Resources	**Local Co-ordinate Reference:**	Site Chaco 23-8 3 #002H
Project:	Chaco Mancos Sec 3, T23N, R8W	**TVD Reference:**	WELL @ 0.0usft (Original Well Elev)
Site:	Chaco 23-8 3 #002H	**MD Reference:**	WELL @ 0.0usft (Original Well Elev)
Well:	Design #1	**North Reference:**	Grid
Wellbore:	Preliminary Design	**Survey Calculation Method:**	Minimum Curvature
Design:	APD Plan	**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)
5,038.2	5,050.0	21.16	263.85	-124.1	107.2	8.93	-103.3
5,084.1	5,100.0	25.63	265.04	-126.0	87.5	8.95	-83.5
5,128.3	5,150.0	30.12	265.90	-127.8	64.2	8.96	-60.1
5,170.5	5,200.0	34.60	266.55	-129.6	37.5	8.97	-33.4
5,210.5	5,250.0	39.09	267.07	-131.2	7.5	8.98	-3.4
5,248.0	5,300.0	43.58	267.50	-132.8	-25.4	8.98	29.6
5,282.8	5,350.0	48.07	267.87	-134.2	-61.3	8.98	65.4
5,314.8	5,400.0	52.57	268.18	-135.6	-99.7	8.99	103.9
5,343.6	5,450.0	57.06	268.46	-136.8	-140.6	8.99	144.8
5,369.1	5,500.0	61.56	268.71	-137.8	-183.5	8.99	187.8
5,391.1	5,550.0	66.05	268.94	-138.7	-228.4	8.99	232.6
5,409.6	5,600.0	70.55	269.16	-139.5	-274.8	8.99	279.0
5,424.4	5,650.0	75.04	269.37	-140.1	-322.6	8.99	326.8
5,435.4	5,700.0	79.54	269.56	-140.6	-371.3	8.99	375.5
5,442.6	5,750.0	84.04	269.75	-140.9	-420.8	8.99	425.0
5,445.8	5,800.0	88.53	269.94	-141.0	-470.7	8.99	474.9
5,446.0	5,816.3	90.00	270.00	-141.0	-487.0	8.99	491.2
5,445.9	5,900.0	90.08	270.00	-141.0	-570.7	0.10	574.8
Intermediate Casing							
5,445.7	6,000.0	90.18	270.00	-141.0	-670.7	0.10	674.8
5,445.3	6,100.0	90.28	270.00	-141.0	-770.7	0.10	774.7
5,444.7	6,200.0	90.38	270.00	-141.0	-870.7	0.10	874.7
5,444.0	6,300.0	90.48	270.00	-141.0	-970.7	0.10	974.6
5,443.0	6,400.0	90.58	270.00	-141.0	-1,070.7	0.10	1,074.6
5,441.9	6,500.0	90.68	270.00	-141.0	-1,170.7	0.10	1,174.5
5,440.7	6,600.0	90.78	270.00	-141.0	-1,270.6	0.10	1,274.4
5,439.2	6,700.0	90.88	270.00	-141.0	-1,370.6	0.10	1,374.4
5,437.6	6,800.0	90.98	270.00	-141.0	-1,470.6	0.10	1,474.3
5,435.8	6,900.0	91.08	270.00	-141.0	-1,570.6	0.10	1,574.3
5,433.8	7,000.0	91.18	270.00	-141.0	-1,670.6	0.10	1,674.2
5,431.7	7,100.0	91.28	270.00	-141.0	-1,770.6	0.10	1,774.1
5,429.4	7,200.0	91.38	270.00	-141.0	-1,870.5	0.10	1,874.0
5,426.9	7,300.0	91.48	270.00	-141.0	-1,970.5	0.10	1,974.0
5,424.2	7,400.0	91.58	270.00	-141.0	-2,070.5	0.10	2,073.9
5,421.4	7,500.0	91.68	270.00	-141.0	-2,170.4	0.10	2,173.8
5,418.3	7,600.0	91.78	270.00	-141.0	-2,270.4	0.10	2,273.7
5,415.1	7,700.0	91.88	270.00	-141.0	-2,370.3	0.10	2,373.6
5,411.8	7,800.0	91.98	270.00	-141.0	-2,470.3	0.10	2,473.5
5,408.2	7,900.0	92.08	270.00	-141.0	-2,570.2	0.10	2,573.4
5,404.5	8,000.0	92.18	270.00	-141.0	-2,670.1	0.10	2,673.3
5,400.7	8,100.0	92.28	270.00	-141.0	-2,770.1	0.10	2,773.1
5,396.6	8,200.0	92.38	270.00	-141.0	-2,870.0	0.10	2,873.0
5,392.4	8,300.0	92.48	270.00	-141.0	-2,969.9	0.10	2,972.9
5,388.0	8,400.0	92.57	270.00	-141.0	-3,069.8	0.10	3,072.7
5,383.4	8,500.0	92.67	270.00	-141.0	-3,169.7	0.10	3,172.6

Energen

Preliminary Design

Company:	Energen Resources	**Local Co-ordinate Reference:**	Site Chaco 23-8 3 #002H
Project:	Chaco Mancos Sec 3, T23N, R8W	**TVD Reference:**	WELL @ 0.0usft (Original Well Elev)
Site:	Chaco 23-8 3 #002H	**MD Reference:**	WELL @ 0.0usft (Original Well Elev)
Well:	Design #1	**North Reference:**	Grid
Wellbore:	Preliminary Design	**Survey Calculation Method:**	Minimum Curvature
Design:	APD Plan	**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)
5,378.6	8,600.0	92.77	270.00	-141.0	-3,269.6	0.10	3,272.4
5,373.7	8,700.0	92.87	270.00	-141.0	-3,369.5	0.10	3,372.2
5,368.6	8,800.0	92.97	270.00	-141.0	-3,469.3	0.10	3,472.0
5,363.3	8,900.0	93.07	270.00	-141.0	-3,569.2	0.10	3,571.9
5,357.9	9,000.0	93.17	270.00	-141.0	-3,669.0	0.10	3,671.7
5,352.3	9,100.0	93.27	270.00	-141.0	-3,768.9	0.10	3,771.5
5,346.5	9,200.0	93.37	270.00	-141.0	-3,868.7	0.10	3,871.2
5,340.5	9,300.0	93.47	270.00	-141.0	-3,968.5	0.10	3,971.0
5,334.4	9,400.0	93.57	270.00	-141.0	-4,068.4	0.10	4,070.8
5,328.0	9,500.0	93.67	270.00	-141.0	-4,168.2	0.10	4,170.5
5,321.5	9,600.0	93.77	270.00	-141.0	-4,267.9	0.10	4,270.3
5,314.9	9,700.0	93.87	270.00	-141.0	-4,367.7	0.10	4,370.0
5,308.0	9,800.0	93.97	270.00	-141.0	-4,467.5	0.10	4,469.7
5,306.0	9,830.0	94.00	270.00	-141.0	-4,497.4	0.10	4,499.6
Production Liner							
5,305.9	9,830.3	94.00	270.00	-141.0	-4,497.7	0.10	4,499.9

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,900.0	5,445.9	Intermediate Casing	7	8-3/4
9,830.0	5,306.0	Production Liner	4-1/2	6-1/4
500.0	500.0	Surface Casing	9-5/8	12-1/4

Checked By: _____ Approved By: _____ Date: _____

The water hauler(s) will access the proposed well pad via the roads described in Section 3: Existing, New and/or Reconstructed Access Roads.

8. CONSTRUCTION PLAN AND MATERIALS

The BLM-FFO will be notified (505-564-7600) at least 48 hours prior to the start of construction activities associated with the proposed project. Approximately 3-6 weeks of construction will be required for the construction phase of the proposed project. Working areas will be confined to the proposed project area as described in Section 2: Project Location and Description.

Vegetation removed during construction, including trees that measure less than three inches in diameter (at ground level) and slash/brush, will be chipped or mulched and incorporated into the topsoil as additional organic matter (See also Appendix A: Reclamation Plan). Over the entire project approximately 50 pinion and juniper trees three inches in diameter or greater (at ground level) will be cut to ground level and delimbed. There are approximately 20 trees on the proposed well pad, 20 trees on the proposed access road route, and 10 trees are confined to the proposed Chaco 23-08 3 #1H Pipeline ROW. Tree trunks (left whole) and cut limbs will be placed along the access road in a manner which will not create additional disturbance or degrade any reclamation. The subsurface portion of trees (tree stumps) will be hauled to an approved disposal facility.

Construction and maintenance activities will cease when soil or road surfaces become saturated to the extent that construction equipment is unable to stay within the proposed project area and/or when activities cause irreparable harm to roads, soils or streams. No frozen soils will be used for construction purposes or trench backfilling. Energen will use the six-step frozen ground procedure during frozen ground conditions.

The top six inches of topsoil will be stripped and stockpiled within the construction zone. Topsoil stripped from the surface of the proposed project area during the construction phase of the proposed project will be stored and protected until it is redistributed during reclamation. Topsoil will be stored within the construction zone separately from subsoil material. The topsoil will be free of brush, tree limbs, trunks, and roots. Vehicle/equipment traffic will not be allowed to cross topsoil stockpiles. The topsoil will be protected using wattles or other BMPs so that erosion is minimized. If topsoil is stored for a length of time such that nutrients are depleted, amendments will be added to the topsoil as advised by the Energen's environmental scientist or appropriate agent/contractor.

The well pad will be leveled with heavy equipment to provide space and a level surface for vehicles and equipment. Excavated materials from the cuts will be used to the fill portions of the location to level the proposed well pad. Approximately 16.4 feet of cut and 10.5 feet of fill will be needed to create a level well pad. No additional materials will be required for construction of the proposed well pad.

Within 90 days of installation, aboveground structures not subject to safety requirements will be painted according to stipulations as outlined in the BLM COAs to reduce visual resource impacts and blend with vegetation and characteristics of the surrounding landscape.

Construction plats are provided in the APD and ROW grant permit packages.

9. METHODS FOR HANDLING WASTE

Drilling operations will utilize a closed-loop system. Drilling of the horizontal lateral will be done using a water based mud system. All water-based mud cuttings will be hauled to a commercial disposal facility. The drilling operations area will be enclosed by a containment berm and ditches, and the containment berm will be ramped to allow access to the solids control area. The contained operations area will drain gradually to one area of the pad which will be contoured for spill prevention and control.

ENERGEN RESOURCES CORPORATION

CHACO 23-08-3 #2H
2119' FNL & 213' FEL
LOCATED IN THE SE/4 NE/4 OF SECTION 3,
T23N, R8W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO

DIRECTIONS

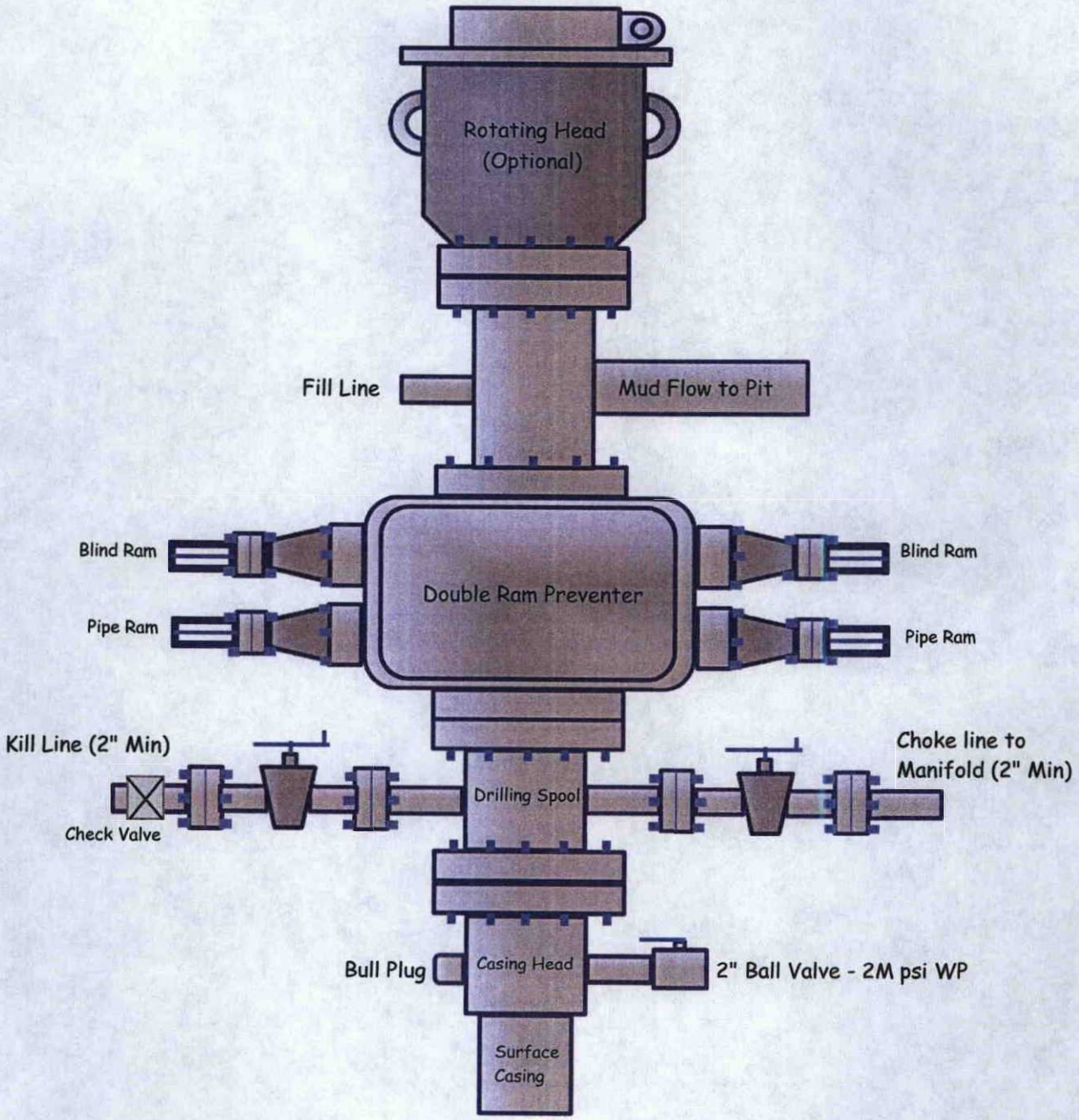
1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 41.0 MILES TO M.P. 110.6.
2) TURN LEFT AND GO 0.7 MILES TO WHERE ACCESS IS STAKED.

WELL FLAG LOCATED AT LAT. 36.257736° N, LONG.107.660870° W (NAD 83).

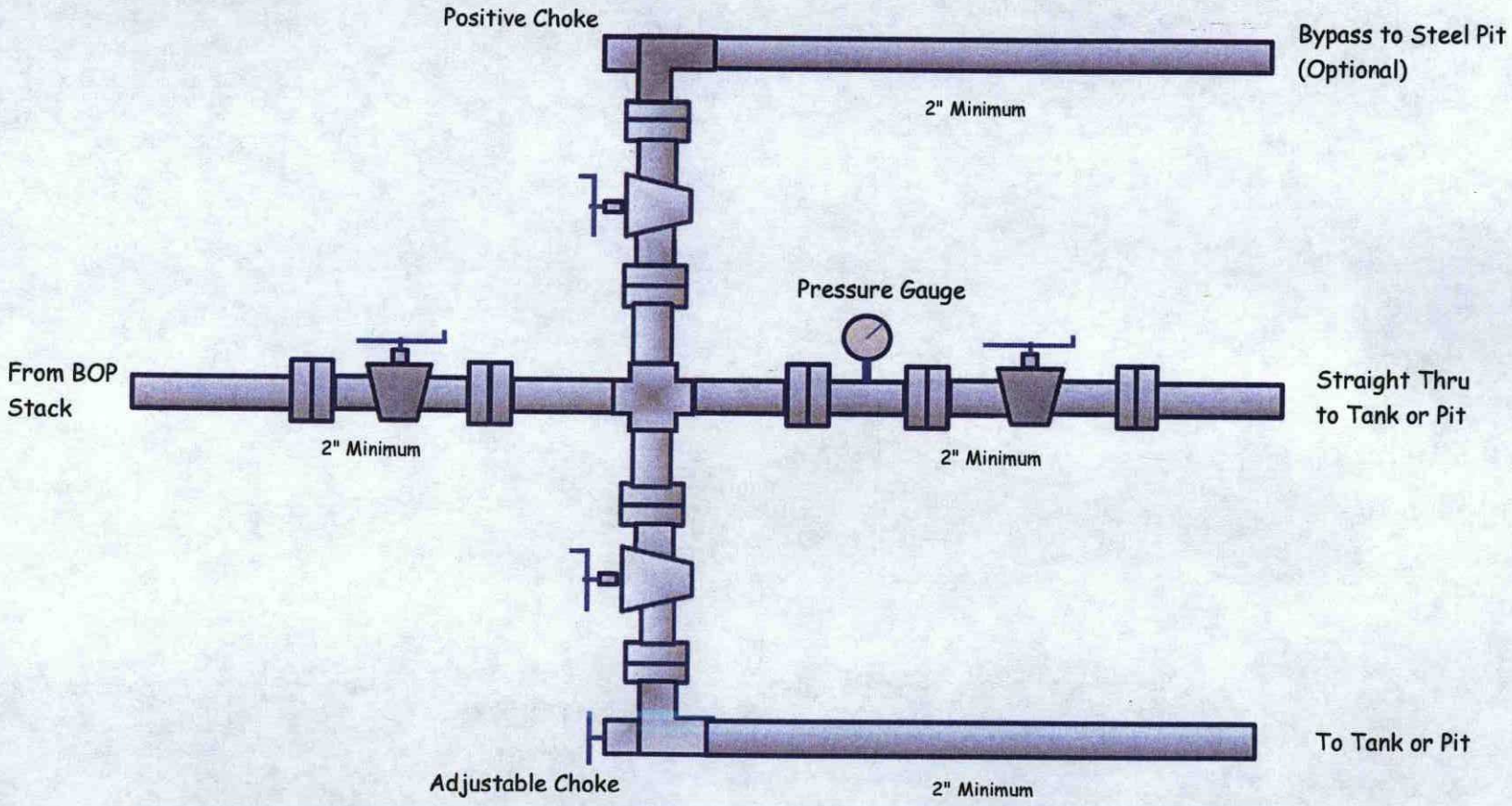
JOB No.: ERG328
DATE: 08/26/2014

Scorpion Survey & Consulting, L.L.C.
302 S. Ash
Aztec, New Mexico 87410
(505) 334-4007

Typical BOP Schematic - 3M psi System



2M Choke & Kill Manifold



Note: All connections are bolted flange
Working pressure for all equipment is
2,000 psi or greater