

### Roswell Controlled Water Basin

United State Department of the Interior

BUREAU OF LAND MANAGEMENT

Roswell Resource Area

P.O. Drawer 1857

Roswell, New Mexico 88202-1857

Statement Accepting Responsibility for Operations

Operator name: Mack Energy Corporation  
Street or box : P.O. Box 960  
City, State : Artesia, NM  
Zip Code, : 88211-0960

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Lease No.: NMNM-112877 Lion Federal #1

Legal Description of land: Sec. 14 T21S R21E SE/4 NE/4

Formation(s) (if applicable): Wildcat Morrow

Bond Coverage: (State if individually bonded or another's bond)

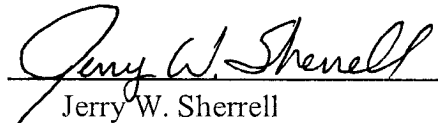
Individually Bonded

STATEWIDE

RS

BLM Bond File No.: NMB000286

Authorized Signature:

  
Jerry W. Sherrell

Title: Production Clerk

Date: 12/19/2006

DISTRICT I  
1625 N. FRANCE DR., BOBBS, NM 88240

DISTRICT II  
1301 W. GRAND AVENUE, ARTESHA, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Artec, NM 87410

DISTRICT IV  
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION  
1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505



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

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name Wildcat Morrow
Property Code	Property Name LION FEDERAL	Well Number 1
OGRID No. 013837	Operator Name MACK ENERGY CORPORATION	Elevation 4555'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	14	21-S	21-E		2490	SOUTH	815	EAST	EDDY

Bottom Hole Location If Different From Surface

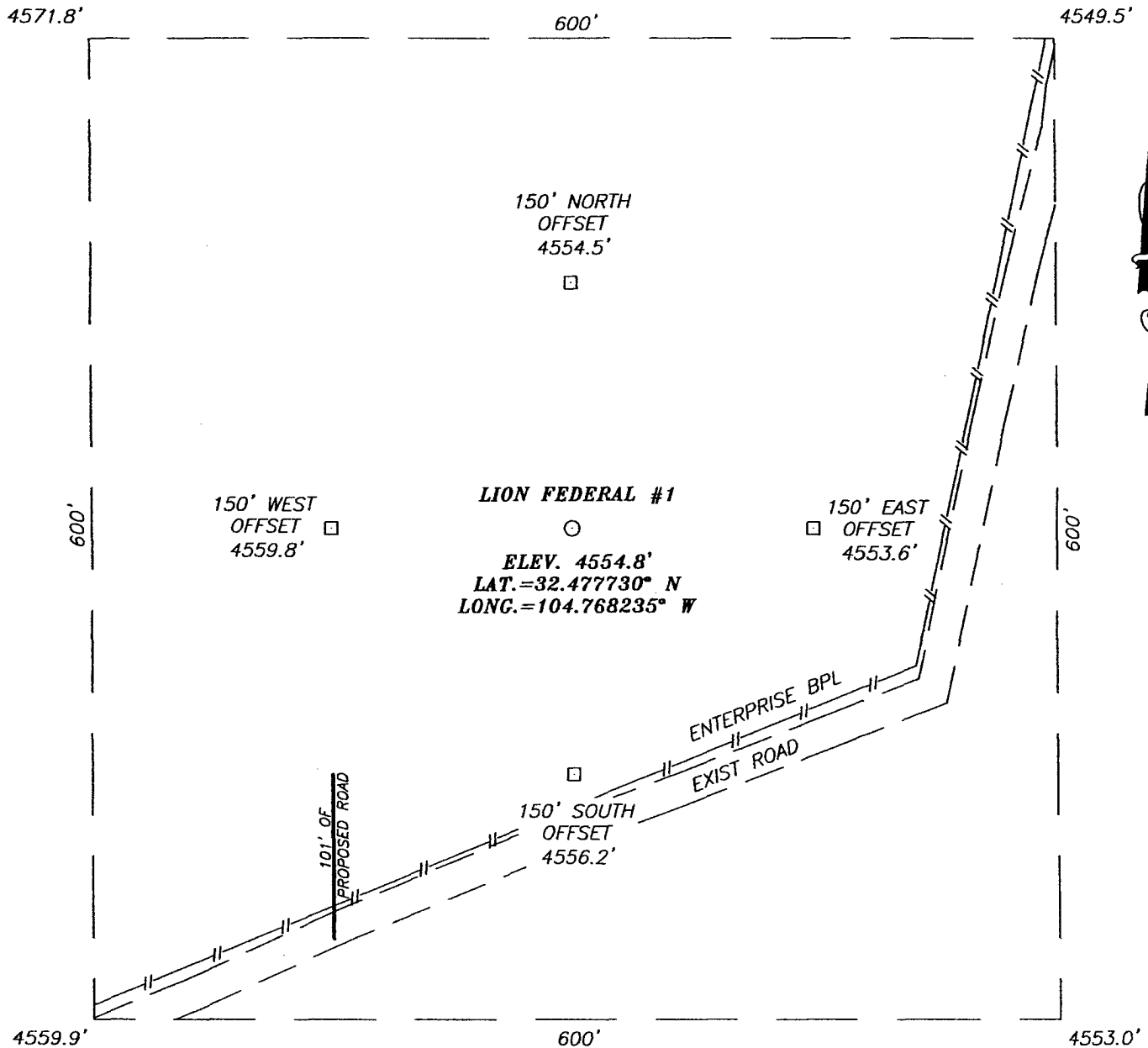
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	14	21S	21E		1980	NORTH	660	EAST	EDDY

Dedicated Acres 320	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

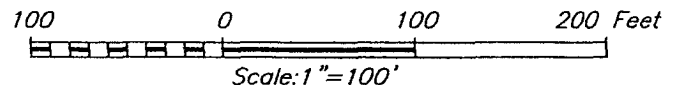
<p>PROJECT AREA</p> <p>PRODUCING AREA</p> <p>GEODETIC COORDINATES NAD 27 NME</p> <p>Y=537784.5 N X=365886.0 E</p> <p>LAT.=32.477730° N LONG.=104.768235° W</p> <p>PENETRATION POINT</p> <p>BHL</p> <p>660'</p> <p>4571.8'</p> <p>4549.5'</p> <p>600'</p> <p>815'</p> <p>4559.9'</p> <p>4553.0'</p> <p>2490'</p>	<p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Jerry W. Sherrell</i> 12/19/06 Signature Date</p> <p>Jerry W. Sherrell Printed Name</p>
	<p><b>SURVEYOR CERTIFICATION</b></p> <p>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.</p> <p>NOVEMBER 3, 2006</p> <p>Date Surveyed JR</p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><i>Gary R. Edmon</i> 11/17/06 06.11.1734</p> <p>Certificate No. GARY EDMON 12841</p>

**SECTION 14, TOWNSHIP 21 SOUTH, RANGE 21 EAST, N.M.P.M.,**  
EDDY COUNTY, NEW MEXICO



**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF ARMSTRONG RD. AND BOX CANYON RD., GO SOUTHEAST ON BOX CANYON RD. APPROX. 1.5 MILES. TURN LEFT AND FOLLOW PIPELINE ROAD EAST/SOUTHEAST APPROX. 0.4 MILES TO A DRY HOLE. CONTINUE APPROX. 0.2 MILES TO A PROPOSED ROAD SURVEY. FOLLOW PROPOSED ROAD SURVEY NORTH APPROX. 250 FEET TO THIS LOCATION.



**MACK ENERGY CORPORATION**

LION FEDERAL #1 WELL  
LOCATED 2490 FEET FROM THE SOUTH LINE  
AND 815 FEET FROM THE EAST LINE OF SECTION 14,  
TOWNSHIP 21 SOUTH, RANGE 21 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.

Survey Date: 11/3/06		Sheet 1 of 1 Sheets	
W.O. Number: 06.11.1734	Dr By: J.R.	Rev 1:N/A	
Date: 11/13/06	Disk: CD#6	06111734	Scale: 1"=100'

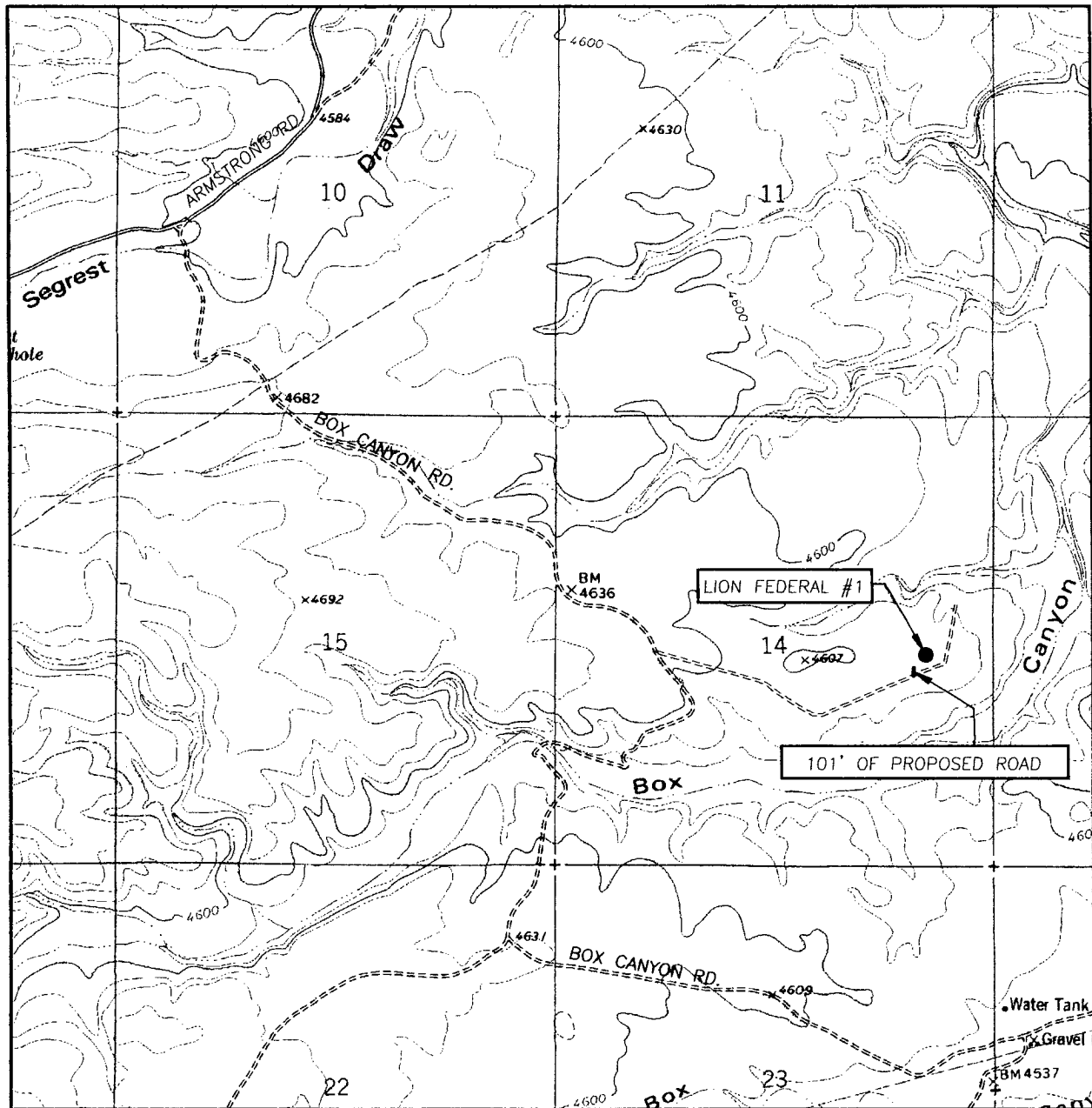


PROVIDING SURVEYING SERVICES  
SINCE 1946

**JOHN WEST SURVEYING COMPANY**

412 N. DAL PASO  
HOBBS, N.M. 88240  
(505) 393-3117

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
TEXAS HILL, N.M. - 40'

SEC. 14 TWP. 21-S RGE. 21-E

SURVEY N.M.P.M.

COUNTY EDDY

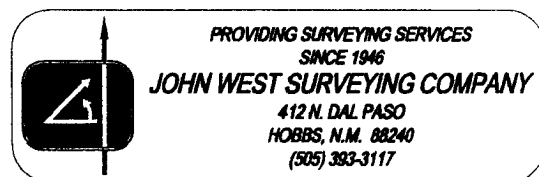
DESCRIPTION 2490' FSL & 815' FEL

ELEVATION 4555'

OPERATOR MAC K ENERGY CORPORATION

LEASE LION FEDERAL

U.S.G.S. TOPOGRAPHIC MAP  
TEXAS HILL, N.M.



Attached to Form 3160-3  
Mack Energy Corporation  
Lion Federal #1  
Surface 2490 FSL & 815 FEL, BHL 1980 FNL & 660 FEL  
Surface NE/4 SE/4, BHL SE/4 NE/4 Sec 14 T21S R21E  
Eddy County, NM

## DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

Glorietta	1420'
Abo	3420'
Wolfcamp	4560'
Morrow	8360'

### 3. Estimated Depths of Anticipated Fresh Water, Oil and Gas:

Water Sand	750'	Fresh Water
Abo	3420'	Oil/Gas
Wolfcamp	4560'	Oil/Gas
Morrow	8360'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Set 13 3/8" casing to 320' and circulating cement back to surface. Set 9 5/8" casing to 1550' and circulating cement back to surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them by cementing 5 1/2" production casing, which will be run at TD.

### 4. Casing Program:

Hole Size	Interval	OD Casing	Weight, Grade, Jt, Cond., Type
17 1/2"	0-320'	13 3/8"	48#, H-40, ST&C, New, R-3
12 1/4"	0-1550'	9 5/8"	36#, J-55, ST&C, New, R-3
7 7/8"	0-TD	5 1/2"	17#, J-55, LT&C, New, R-3

### 5. Cement Program:

13 3/8" Surface Casing: Circulate to Surface with Class C w/2% CaCl<sub>2</sub>.

9 5/8" Intermediate Casing: Circulate to Surface with Class C W/2% CaCl<sub>2</sub>.

5 1/2" Production Casing: Cement Casing with Class C w/6# Salt & 2/10 of 1% CFR-3 per sack. We will run a hole caliper and run sufficient cement to circulate to surface.

### 6. Minimum Specifications for Pressure Control:

Attached to Form 3160-3  
Mack Energy Corporation  
Lion Federal #1  
Surface 2490 FSL & 815 FEL, BHL 1980 FNL & 660 FEL  
Surface NE/4 SE/4, BHL SE/4 NE/4 Sec 14 T21S R21E  
Eddy County, NM

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on bottom. If ran the BOP will be nipped up on the 13 3/8" surface casing and tested to 1500 psi by a 3<sup>rd</sup> party. The BOP will then be nipped up on the 9 5/8" intermediate casing and tested by a 3<sup>rd</sup> party to 2000 psi and used continuously until TD is reached. All BOP's and accessory equipment will be tested to 2000 psi before drilling out of intermediate casing. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve and choke lines and choke manifold (Exhibit #11) with 2000 psi WP rating.

**7. Types and Characteristics of the Proposed Mud System:**

The well will be drilled to TD with a combination of brine, cut brine and polymer mud system. The applicable depths and properties of this system are as follows:

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-1550'	Fresh Water	8.5	28	N.C.
1550'-TD	Cut Brine	9.1	29	N.C.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

**8. Auxiliary Well Control and Monitoring Equipment:**

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

**9. Logging, Testing and Coring Program:**

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be ran from T.D. to 9 5/8 casing shoe.
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

## Mack Energy Corporation

### Hydrogen Sulfide Drilling Operation Plan

#### I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H<sub>2</sub>S of wells in this area from surface to TD are low enough that a contingency plan is not required.**



## II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

### 1. Well Control Equipment:

- A. Flare line.
- B. Choke manifold.
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

### 2. Protective equipment for essential personnel:

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

### 3. H2S detection and monitoring equipment:

- A. 1 portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

### 4. Visual warning systems:

- A. Wind direction indicators as shown on well site diagram (Exhibit #8).
- B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

### 5. Mud program:

- A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

**6. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H<sub>2</sub>S service.
- B. All elastomers used for packing and seals shall be H<sub>2</sub>S trim.

**7. Communication:**

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

**8. Well testing:**

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H<sub>2</sub>S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

**EXHIBIT #7**

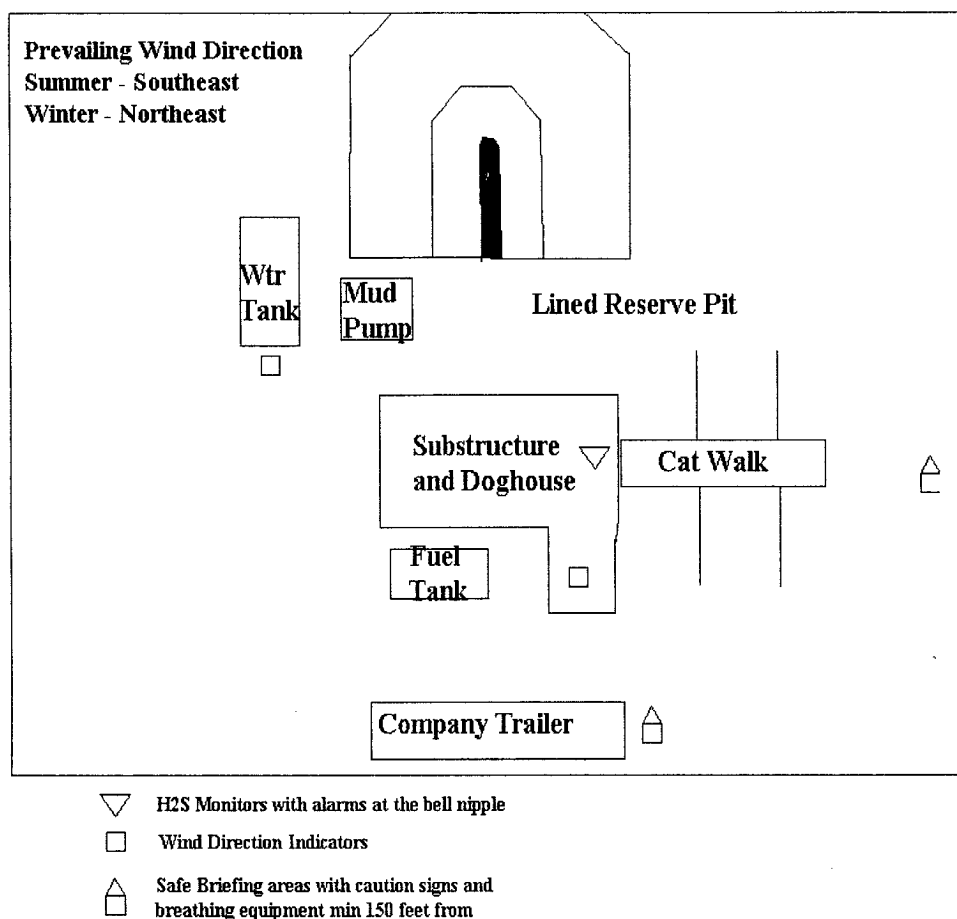
**WARNING**  
**YOU ARE ENTERING AN H<sub>2</sub>S**  
**AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED**
- 2. HARD HATS REQUIRED**
- 3. SMOKING IN DESIGNATED AREAS ONLY**
- 4. BE WIND CONSCIOUS AT ALL TIMES**
- 5. CHECK WITH MACK ENERGY FOREMAN AT OFFICE**

**MACK ENERGY CORPORATION**

**1-505-748-1288**

**DRILLING LOCATION H2S SAFTY EQUIPMENT**  
**Exhibit # 8**

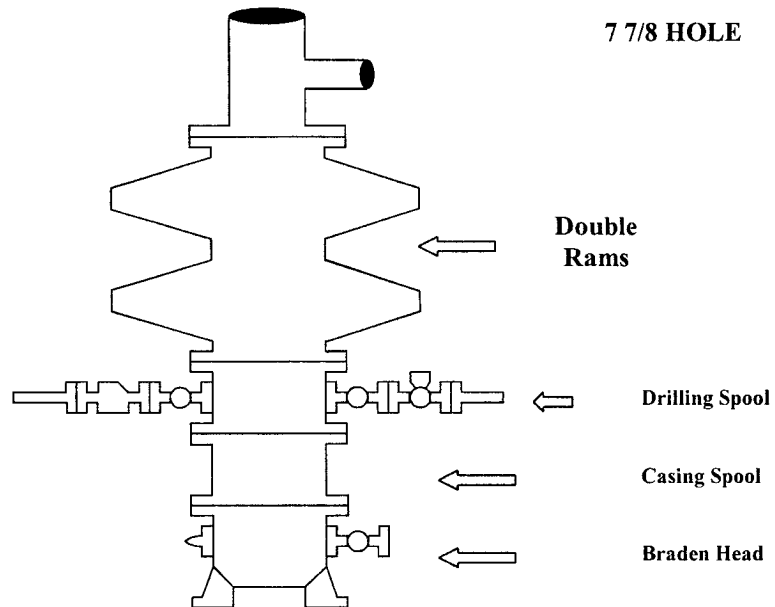


**Attachment to Exhibit #9**  
**NOTES REGARDING THE BLOWOUT PREVENTERS**  
**Lion Federal #1**  
**Eddy County, New Mexico**

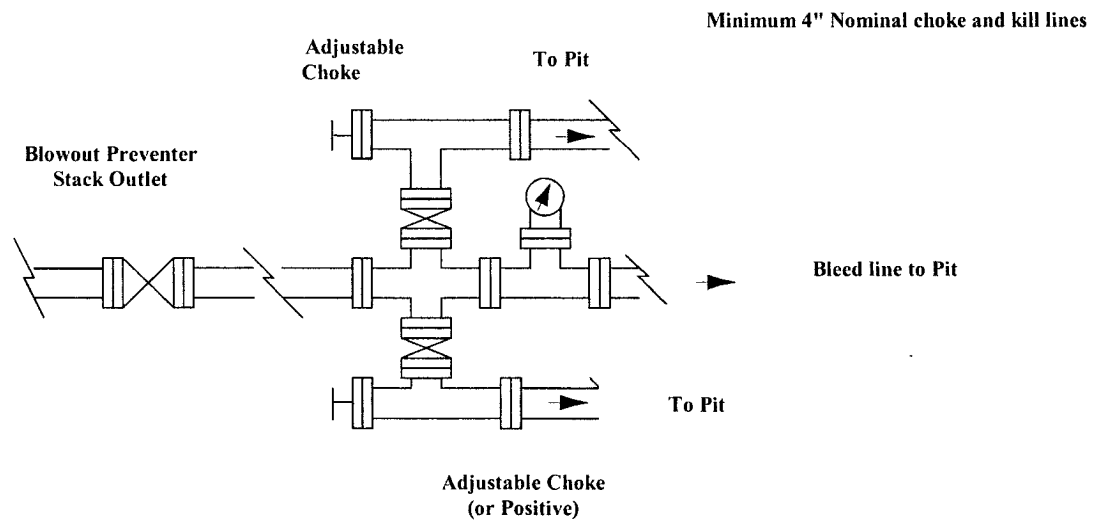
1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

# Mack Energy Corporation

## Exhibit #9 BOPE Schematic



Choke Manifold Requirement (2000 psi WP)  
No Annular Required



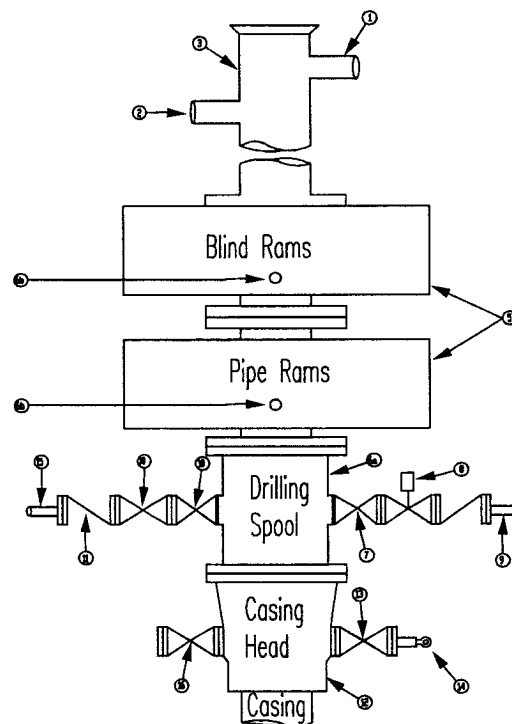
**Mack Energy Corporation**  
**Minimum Blowout Preventer Requirements**  
**2000 psi Working Pressure**  
**2 MWP**  
**EXHIBIT #10**

**Stack Requirements**

NO.	Items	Min. I.D.	Min. Nominal
1	Flowline		2"
2	Fill up line		2"
3	Drilling nipple		
4	Annular preventer		
5	Two single or one dual hydraulically operated rams		
6a	Drilling spool with 2" min. kill line and 3" min choke line outlets		2" Choke
6b	2" min. Kill line and 3" min. choke line outlets in ram. (Alternate to 6a above)		
7	Valve Gate Plug	3 1/8	
8	Gate valve-power operated	3 1/8	
9	Line to choke manifold		3"
10	Valve Gate Plug	2 1/16	
11	Check valve	2 1/16	
12	Casing head		
13	Valve Gate Plug	1 13/16	
14	Pressure gauge with needle valve		
15	Kill line to rig mud pump manifold		2"

**OPTIONAL**

16	Flanged Valve	1 13/16	
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**CONTRACTOR'S OPTION TO FURNISH:**

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 2000 psi minimum.
2. Automatic accumulator (80 gallon, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure.
3. BOP controls, to be located near drillers' position.
4. Kelly equipped with Kelly cock.
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
6. Kelly saver-sub equipped with rubber casing protector at all times.
7. Plug type blowout preventer tester.
8. Extra set pipe rams to fit drill pipe in use on location at all times.
9. Type RX ring gaskets in place of Type R.

**MEC TO FURNISH:**

1. Bradenhead or casing head and side valves.
2. Wear bushing. If required.

**GENERAL NOTES:**

1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager.
2. All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service.
3. Controls to be of standard design and each marked, showing opening and closing position
4. Chokes will be positioned so as not to hamper or delay changing of choke beans. Replaceable parts for adjustable choke, or bean

5. sizes, retainers, and choke wrenches to be conveniently located for immediate use.
6. All valves to be equipped with hand-wheels or handles ready for immediate use.
7. Choke lines must be suitably anchored.
8. Handwheels and extensions to be connected and ready for use.
9. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency.
10. All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
11. Casinghead connections shall not be used except in case of emergency.
12. Do not use kill line for routine fill up operations.

# Mack Energy Corporation

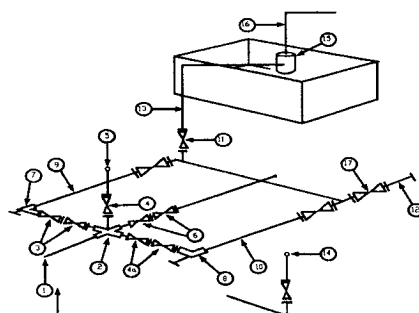
Exhibit #11

## MINIMUM CHOKE MANIFOLD

3,000, 5,000, and 10,000 PSI Working Pressure

2 M will be used or greater

3 MWP - 5 MWP - 10 MWP



Mud Pit

Reserve Pit

\* Location of separator optional

Below Substructure

### Minimum requirements

No.		3,000 MWP			5,000 MWP			10,000 MWP		
		I.D.	NOMINAL	Rating	I.D.	Nominal	Rating	I.D.	Nominal	Rating
1	Line from drilling Spool		3"	3,000		3"	5,000		3"	10,000
2	Cross 3" x 3" x 3" x 2"			3,000			5,000			
2	Cross 3" x 3" x 3" x 2"									10,000
3	Valve Gate Plug	3 1/8"		3,000	3 1/8"		5,000	3 1/8"		10,000
4	Valve Gate Plug	1 13/16"		3,000	1 13/16"		5,000	1 13/16"		10,000
4a	Valves (1)	2 1/16"		3,000	2 1/16"		5,000	2 1/16"		10,000
5	Pressure Gauge			3,000			5,000			10,000
6	Valve Gate Plug	3 1/8"		3,000	3 1/8"		5,000	3 1/8"		10,000
7	Adjustable Choke (3)	2"		3,000	2"		5,000	2"		10,000
8	Adjustable Choke	1"		3,000	1"		5,000	2"		10,000
9	Line		3"	3,000		3"	5,000		3"	10,000
10	Line		2"	3,000		2"	5,000		2"	10,000
11	Valve Gate Plug	3 1/8"		3,000	3 1/8"		5,000	3 1/8"		10,000
12	Line		3"	1,000		3"	1,000		3"	2,000
13	Line		3"	1,000		3"	1,000		3"	2,000
14	Remote reading compound Standpipe pressure quage			3,000			5,000			10,000
15	Gas Separator		2' x 5'			2' x 5'			2' x 5'	
16	Line		4"	1,000		4"	1,000		4"	2,000
17	Valve Gate Plug	3 1/8"		3,000	3 1/8"		5,000	3 1/8"		10,000

- (1) Only one required in Class 3M  
 (2) Gate valves only shall be used for Class 10 M  
 (3) Remote operated hydraulic choke required on 5,000 psi and 10,000 psi for drilling.

### EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

- All connections in choke manifold shall be welded, studded, flanged or Cameron clamp of comparable rating.
- All flanges shall be API 6B or 6BX and ring gaskets shall be API RX or BX. Use only BX for 10 MWP.
- All lines shall be securely anchored.
- Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available.
- Choke manifold pressure and standpipe pressure gauges shall be available at the choke manifold to assist in regulating chokes. As an alternate with automatic chokes, a choke manifold pressure gauge shall be located on the rig floor in conjunction with the standpipe pressure gauge.
- Line from drilling spool to choke manifold should be as straight as possible. Lines downstream from chokes shall make turns by large bends or 90 degree bends using bull plugged tees.

## CONDITIONS OF APPROVAL - DRILLING

**Operator's Name:** MACK ENERGY CORPORATION  
**Well Name & No.** 1 - LION FEDERAL  
**Location:** 2490' FSL & 815' FEL - SEC 14 - T21S - R21E - EDDY COUNTY (SHL)  
1980' FNL & 660' FEL - SEC 14 - T21S - R21E - EDDY COUNTY (BHL)  
**Lease:** NM-112877

### I. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Roswell Field Office, 2909 West Second St., Roswell NM 88201, (505) 627-0272 for wells in Chaves and Roosevelt Counties; the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 234-5909 or (505) 361-2822 (After hours) - for wells in Eddy County; and the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (505) 393-3612 for wells in Lea County, in sufficient time for a representative to witness:
  - A. Spudding
  - B. Cementing casing: 13-3/8 inch 9-5/8 inch 5-1/2 inch
  - C. BOP tests
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
3. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing ( size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15 day time frame.
4. The API No. assigned to the well by NMOCD shall be included on the subsequent report of setting the first casing string.
5. Gamma-Ray/Neutron logs shall be run from the base of the Salado Formation to the surface; cable speed not to exceed 30 feet per minute.

### II. CASING:

1. The 13-3/8 inch surface casing shall be set at 320 feet, below usable water and cement circulated to the surface. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.
2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is circulate cement to the surface.
4. The minimum required fill of cement behind the 5-1/2 inch production casing is cement shall tie back a minimum of 200 feet into the 9-5/8 inch intermediate casing.



### **III. PRESSURE CONTROL:**

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the 13-3/8 inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.
2. Minimum working pressure of the blowout preventer and related equipment (BOPE) required for drilling the surface and intermediate casing shall be 2000 psi. Minimum working pressure of the blowout preventer and related equipment (BOPE) required for drilling below the 9-5/8 inch casing shall be 2000 psi.
3. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.
  - The tests shall be done by an independent service company.
  - The results of the test shall be reported to the appropriate BLM office.
  - Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
  - Testing must be done in a safe workman-like manner. Hard line connections shall be required.
  - BOPE must be tested prior to drilling into the Wolfcamp Formation by an independent service company.

### **IV. DRILLING MUD:**

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp Formation, and shall be used until production casing is run and cemented. Monitoring equipment shall consist of the following:

1. Recording pit level indicator to indicate volume gains and losses.
2. Mud measuring device for accurately determining the mud volumes necessary to fill the hole during trips.
3. Flow-sensor on the flow line to warn of abnormal mud returns from the well.



## **Mack Energy Corp.**

**Eddy County, NM (NAD 27 NME)**

**Lion Federal #1**

**Lion Federal #1**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**19 February, 2007**





# Scientific Drilling Planning Report



Database: EDM 2003.14 Single User Db  
Company: Mack Energy Corp.  
Project: Eddy County, NM (NAD 27 NME)  
Site: Lion Federal #1  
Well: Lion Federal #1  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Well Lion Federal #1  
WELL @ 4572.00ft (KB Elev)  
WELL @ 4572.00ft (KB Elev)  
Grid  
Minimum Curvature

Project: Eddy County, NM (NAD 27 NME)  
Map System: US State Plane 1927 (Exact solution)  
Geo Datum: NAD 1927 (NADCON CONUS)  
Map Zone: New Mexico East 3001  
System Datum: Mean Sea Level

Site: Lion Federal #1  
Site Position: Northing: 537,784.50 ft Latitude: 32° 28' 39.827 N  
From: Map Easting: 365,886.00 ft Longitude: 104° 46' 5.645 W  
Position Uncertainty: 0.00 ft Slot Radius: ft Grid Convergence: -0.23 °

Well: Lion Federal #1, 2490' FSL & 815' FEL  
Well Position: +N/-S 0.00 ft Northing: 537,784.50 ft Latitude: 32° 28' 39.827 N  
+E/-W 0.00 ft Easting: 365,886.00 ft Longitude: 104° 46' 5.645 W  
Position Uncertainty: 0.00 ft Wellhead Elevation: 4,572.00 ft Ground Level: 0.00 ft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2007-02-19	8.64	60.31	49,069

Design: Plan #1  
Audit Notes:  
Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	9.63

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,650.00	0.00	0.00	1,650.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,132.12	14.46	9.63	2,127.02	59.68	10.13	3.00	3.00	0.00	9.63	
4,876.56	14.46	9.63	4,784.47	735.48	124.81	0.00	0.00	0.00	0.00	
5,599.74	0.00	0.00	5,500.00	825.00	140.00	2.00	-2.00	0.00	180.00	
8,599.74	0.00	0.00	8,500.00	825.00	140.00	0.00	0.00	0.00	0.00	PBHL-Lion Fed #1



# Scientific Drilling Planning Report



Database: EDM 2003.14 Single User Db  
Company: Mack Energy Corp.  
Project: Eddy County, NM (NAD 27 NME)  
Site: Lion Federal #1  
Well: Lion Federal #1  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well Lion Federal #1  
WELL @ 4572.00ft (KB Elev)  
WELL @ 4572.00ft (KB Elev)  
Grid  
Minimum Curvature

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	N/S (ft)	E/W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North HL-Lion Fed #1 - South HL-Lion Fed #1									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,550.00	0.00	0.00	1,550.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8" Casing									
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,650.00	0.00	0.00	1,650.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP - build 3.00°/100'									
1,700.00	1.50	9.63	1,699.99	0.65	0.11	0.65	3.00	3.00	0.00
1,800.00	4.50	9.63	1,799.85	5.80	0.99	5.89	3.00	3.00	0.00
1,900.00	7.50	9.63	1,899.29	16.11	2.73	16.34	3.00	3.00	0.00
2,000.00	10.50	9.63	1,998.04	31.53	5.35	31.98	3.00	3.00	0.00
2,100.00	13.50	9.63	2,095.85	52.03	8.83	52.77	3.00	3.00	0.00
2,132.12	14.46	9.63	2,127.02	59.68	10.13	60.53	3.00	3.00	0.00
EOC - hold 14.46°									
2,200.00	14.46	9.63	2,192.74	76.39	12.96	77.48	0.00	0.00	0.00
2,300.00	14.46	9.63	2,289.58	101.02	17.14	102.46	0.00	0.00	0.00
2,400.00	14.46	9.63	2,386.41	125.64	21.32	127.44	0.00	0.00	0.00
2,500.00	14.46	9.63	2,483.24	150.27	25.50	152.41	0.00	0.00	0.00
2,600.00	14.46	9.63	2,580.07	174.89	29.68	177.39	0.00	0.00	0.00
2,700.00	14.46	9.63	2,676.90	199.52	33.86	202.37	0.00	0.00	0.00
2,800.00	14.46	9.63	2,773.73	224.14	38.04	227.34	0.00	0.00	0.00
2,900.00	14.46	9.63	2,870.56	248.76	42.21	252.32	0.00	0.00	0.00
3,000.00	14.46	9.63	2,967.39	273.39	46.39	277.30	0.00	0.00	0.00
3,100.00	14.46	9.63	3,064.22	298.01	50.57	302.27	0.00	0.00	0.00
3,200.00	14.46	9.63	3,161.05	322.64	54.75	327.25	0.00	0.00	0.00
3,300.00	14.46	9.63	3,257.88	347.26	58.93	352.23	0.00	0.00	0.00
3,400.00	14.46	9.63	3,354.71	371.89	63.11	377.20	0.00	0.00	0.00
3,500.00	14.46	9.63	3,451.54	396.51	67.29	402.18	0.00	0.00	0.00
3,600.00	14.46	9.63	3,548.37	421.14	71.47	427.16	0.00	0.00	0.00
3,700.00	14.46	9.63	3,645.20	445.76	75.64	452.13	0.00	0.00	0.00
3,800.00	14.46	9.63	3,742.03	470.39	79.82	477.11	0.00	0.00	0.00
3,900.00	14.46	9.63	3,838.86	495.01	84.00	502.09	0.00	0.00	0.00
4,000.00	14.46	9.63	3,935.70	519.63	88.18	527.06	0.00	0.00	0.00
4,100.00	14.46	9.63	4,032.53	544.26	92.36	552.04	0.00	0.00	0.00
4,200.00	14.46	9.63	4,129.36	568.88	96.54	577.02	0.00	0.00	0.00
4,300.00	14.46	9.63	4,226.19	593.51	100.72	601.99	0.00	0.00	0.00
4,400.00	14.46	9.63	4,323.02	618.13	104.90	626.97	0.00	0.00	0.00
4,500.00	14.46	9.63	4,419.85	642.76	109.07	651.95	0.00	0.00	0.00



# Scientific Drilling Planning Report



Database: EDM 2003.14 Single User Db  
Company: Mack Energy Corp.  
Project: Eddy County, NM (NAD 27 NME)  
Site: Lion Federal #1  
Well: Lion Federal #1  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well Lion Federal #1  
WELL @ 4572.00ft (KB Elev)  
WELL @ 4572.00ft (KB Elev)  
Grid  
Minimum Curvature

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Bulld Rate (°/100ft)	Turn Rate (°/100ft)
4,600.00	14.46	9.63	4,516.68	667.38	113.25	676.92	0.00	0.00	0.00
4,700.00	14.46	9.63	4,613.51	692.01	117.43	701.90	0.00	0.00	0.00
4,800.00	14.46	9.63	4,710.34	716.63	121.61	726.88	0.00	0.00	0.00
4,876.56	14.46	9.63	4,784.47	735.48	124.81	746.00	0.00	0.00	0.00
KOP - drop 2.00°/100'									
4,900.00	13.99	9.63	4,807.19	741.16	125.77	751.76	2.00	-2.00	0.00
5,000.00	11.99	9.63	4,904.63	763.33	129.54	774.25	2.00	-2.00	0.00
5,100.00	9.99	9.63	5,002.79	782.13	132.73	793.32	2.00	-2.00	0.00
5,200.00	7.99	9.63	5,101.55	797.55	135.34	808.95	2.00	-2.00	0.00
5,300.00	5.99	9.63	5,200.80	809.55	137.38	821.13	2.00	-2.00	0.00
5,400.00	3.99	9.63	5,300.42	818.14	138.84	829.83	2.00	-2.00	0.00
5,500.00	1.99	9.63	5,400.28	823.29	139.71	835.06	2.00	-2.00	0.00
5,599.74	0.00	0.00	5,500.00	825.00	140.00	836.79	2.00	-2.00	0.00
EOC - hold 0.00°									
5,600.00	0.00	0.00	5,500.26	825.00	140.00	836.79	0.00	0.00	0.00
5,700.00	0.00	0.00	5,600.26	825.00	140.00	836.79	0.00	0.00	0.00
5,800.00	0.00	0.00	5,700.26	825.00	140.00	836.79	0.00	0.00	0.00
5,900.00	0.00	0.00	5,800.26	825.00	140.00	836.79	0.00	0.00	0.00
6,000.00	0.00	0.00	5,900.26	825.00	140.00	836.79	0.00	0.00	0.00
6,100.00	0.00	0.00	6,000.26	825.00	140.00	836.79	0.00	0.00	0.00
6,200.00	0.00	0.00	6,100.26	825.00	140.00	836.79	0.00	0.00	0.00
6,300.00	0.00	0.00	6,200.26	825.00	140.00	836.79	0.00	0.00	0.00
6,400.00	0.00	0.00	6,300.26	825.00	140.00	836.79	0.00	0.00	0.00
6,500.00	0.00	0.00	6,400.26	825.00	140.00	836.79	0.00	0.00	0.00
6,600.00	0.00	0.00	6,500.26	825.00	140.00	836.79	0.00	0.00	0.00
6,700.00	0.00	0.00	6,600.26	825.00	140.00	836.79	0.00	0.00	0.00
6,800.00	0.00	0.00	6,700.26	825.00	140.00	836.79	0.00	0.00	0.00
6,900.00	0.00	0.00	6,800.26	825.00	140.00	836.79	0.00	0.00	0.00
7,000.00	0.00	0.00	6,900.26	825.00	140.00	836.79	0.00	0.00	0.00
7,100.00	0.00	0.00	7,000.26	825.00	140.00	836.79	0.00	0.00	0.00
7,200.00	0.00	0.00	7,100.26	825.00	140.00	836.79	0.00	0.00	0.00
7,300.00	0.00	0.00	7,200.26	825.00	140.00	836.79	0.00	0.00	0.00
7,400.00	0.00	0.00	7,300.26	825.00	140.00	836.79	0.00	0.00	0.00
7,500.00	0.00	0.00	7,400.26	825.00	140.00	836.79	0.00	0.00	0.00
7,600.00	0.00	0.00	7,500.26	825.00	140.00	836.79	0.00	0.00	0.00
7,700.00	0.00	0.00	7,600.26	825.00	140.00	836.79	0.00	0.00	0.00
7,800.00	0.00	0.00	7,700.26	825.00	140.00	836.79	0.00	0.00	0.00
7,900.00	0.00	0.00	7,800.26	825.00	140.00	836.79	0.00	0.00	0.00
8,000.00	0.00	0.00	7,900.26	825.00	140.00	836.79	0.00	0.00	0.00
8,100.00	0.00	0.00	8,000.26	825.00	140.00	836.79	0.00	0.00	0.00
8,200.00	0.00	0.00	8,100.26	825.00	140.00	836.79	0.00	0.00	0.00
8,300.00	0.00	0.00	8,200.26	825.00	140.00	836.79	0.00	0.00	0.00
8,400.00	0.00	0.00	8,300.26	825.00	140.00	836.79	0.00	0.00	0.00
8,500.00	0.00	0.00	8,400.26	825.00	140.00	836.79	0.00	0.00	0.00
8,599.74	0.00	0.00	8,500.00	825.00	140.00	836.79	0.00	0.00	0.00

PBHL-Lion Fed #1



# Scientific Drilling Planning Report



Database: EDM 2003.14 Single User Db  
Company: Mack Energy Corp.  
Project: Eddy County, NM (NAD 27 NME)  
Site: Lion Federal #1  
Well: Lion Federal #1  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well Lion Federal #1  
WELL @ 4572.00ft (KB Elev)  
WELL @ 4572.00ft (KB Elev)  
Grid  
Minimum Curvature

## Targets

Target Name	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
North HL-Lion Fed #1 - plan misses by 824.70ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W500.00 H0.00 D0.00)	0.00	360.00	0.00	810.00	155.00	538,594.50	366,041.00	32° 28' 47.849 N	104° 46' 3.874 W
South HL-Lion Fed #1 - plan misses by 824.70ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W0.00 H500.00 D0.00)	0.00	360.00	0.00	810.00	155.00	538,594.50	366,041.00	32° 28' 47.849 N	104° 46' 3.874 W
PBHL-Lion Fed #1 - plan hits target - Circle (radius 15.00)	0.00	360.00	8,500.00	825.00	140.00	538,609.50	366,026.00	32° 28' 47.997 N	104° 46' 4.050 W

## Casing Points

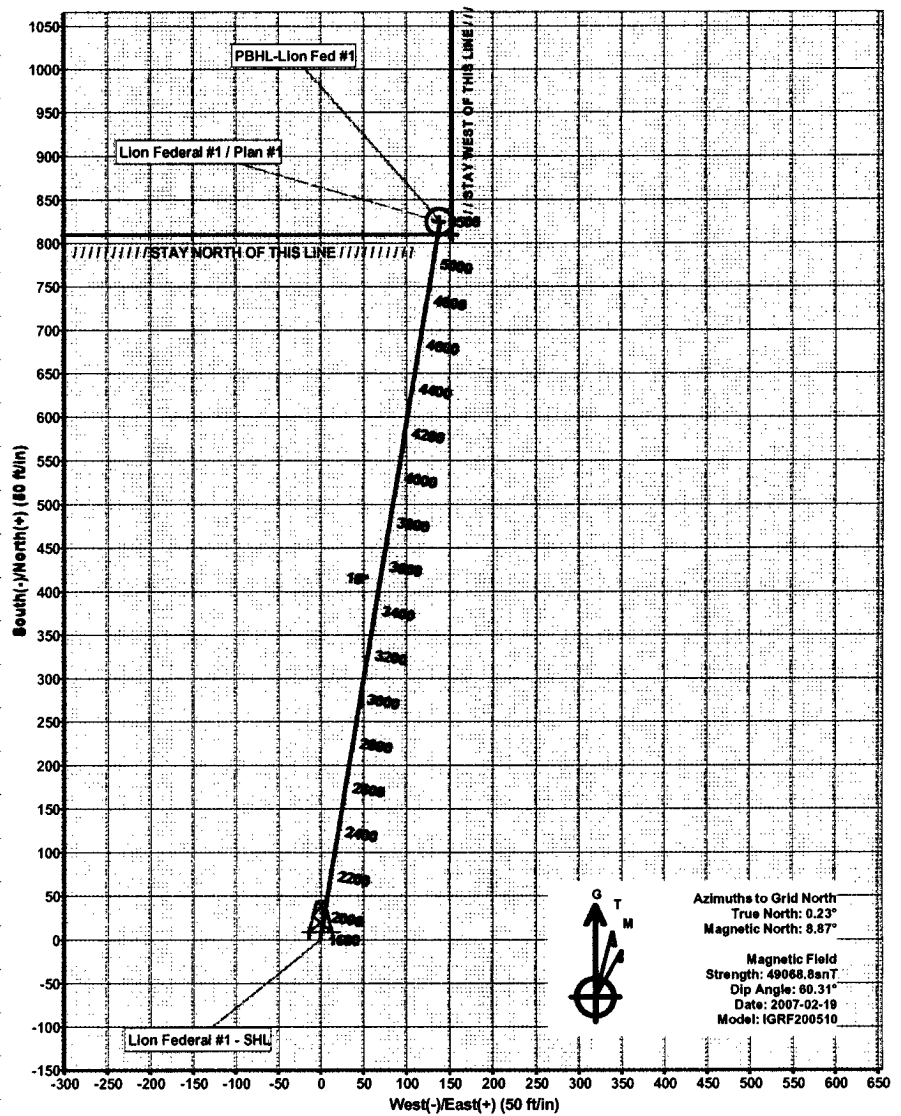
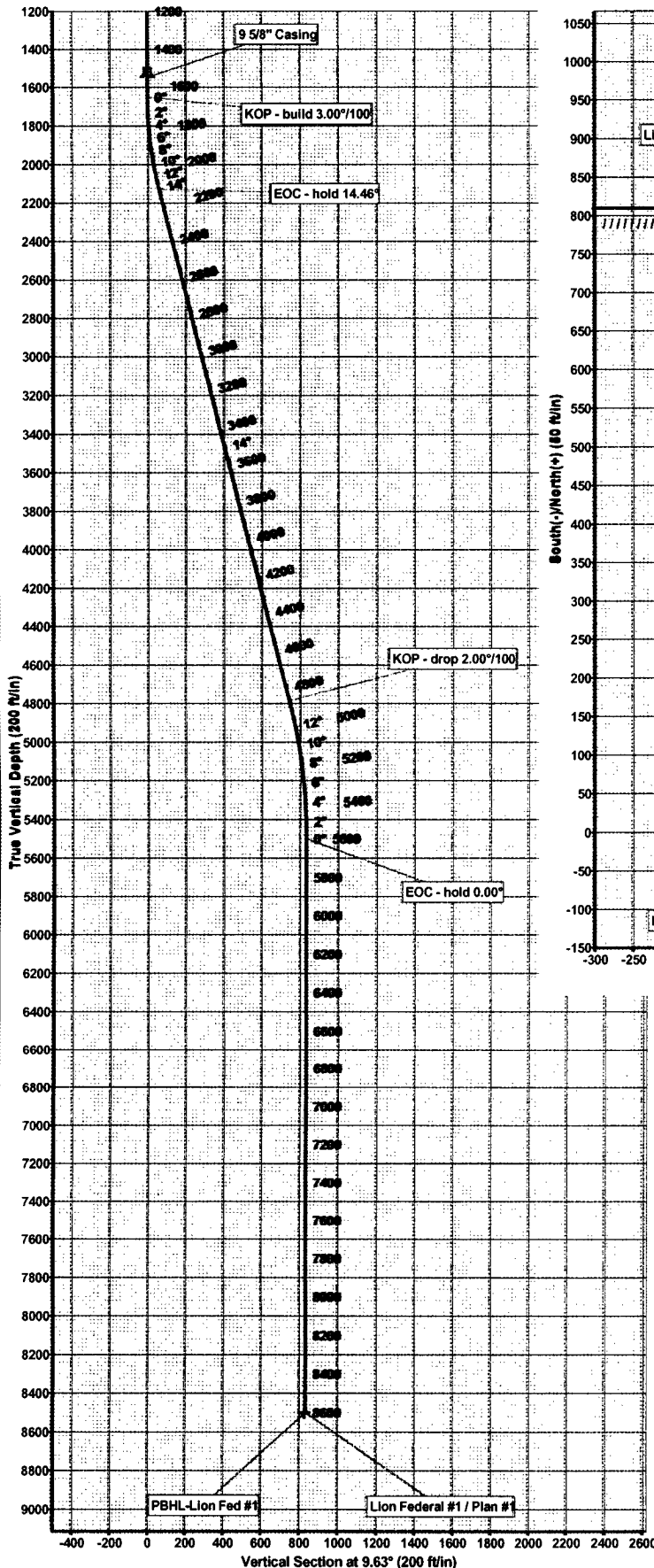
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (ft)	Hole Diameter (ft)
1,550.00	1,550.00	9 5/8" Casing	9.62500	12.25000

## Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,650.00	1,650.00	0.00	0.00	KOP - build 3.00°/100'
2,132.12	2,127.02	59.68	10.13	EOC - hold 14.46°
4,876.56	4,784.47	735.48	124.81	KOP - drop 2.00°/100'
5,599.74	5,500.00	825.00	140.00	EOC - hold 0.00°

# Mack Energy Corp.

Project: Eddy County, NM (NAD 27 NME)  
Site: Lion Federal #1  
Well: Lion Federal #1  
Wellbore: OH  
Design: Plan #1



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1650.00	0.00	0.00	1650.00	0.00	0.00	0.00	0.00	0.00	
3	32132.12	14.46	9.63	2127.02	59.68	10.13	3.00	9.63	60.53	
4	44876.56	14.46	9.63	4784.47	735.48	124.81	0.00	0.00	746.00	
5	55599.74	0.00	0.00	5500.00	825.00	140.00	2.00	180.00	838.79	
6	68599.74	0.00	0.00	8500.00	825.00	140.00	0.00	0.00	838.79	PBHL-Lion Fed #1

## WELL DETAILS: Lion Federal #1

+N/-S	+E/-W	Northing	Ground Level:	Latitude	Longitude	Slot
0.00	0.00	537784.50	0.00	32° 28' 39.827 N	104° 46' 5.645 W	

## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
North HL	0.00	810.00	155.00	32° 28' 47.849 N	104° 46' 3.874 W	Rectangle (Sides: L500.00 W0.00)
South HL	0.00	810.00	155.00	32° 28' 47.849 N	104° 46' 3.874 W	Rectangle (Sides: L0.00 W500.00)
PBHL-Lion #18500.00	825.00	140.00	32° 28' 47.997 N	104° 46' 4.050 W	Circle (Radius: 15.00)	

## PROJECT DETAILS: Eddy County, NM (NAD 27 NME)

Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001

System Datum: Mean Sea Level

## Plan: Plan #1 (Lion Federal #1/OH)

Created By: Julio Piña Date: 19-Feb-07  
Checked: Date:   
Reviewed: Date:   
Approved: Date: