

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

R-111-POTASH

FORM APPROVED  
OMB No. 1004-0137  
Expires March 31, 2007

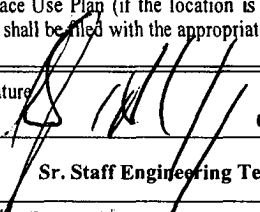
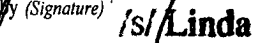
## APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NM-NM0405444	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zones		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Devon Energy Production Company, LP		7. If Unit or CA Agreement, Name and No.	
3a. Address 20 North Broadway Oklahoma City, Oklahoma City 73102-8260		8. Lease Name and Well No. Todd 23L Federal 21 32576	
3b. Phone No. (include area code) 405-552-7802		9. API Well No. 30-015-35034	
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface Unit L NW/4 SW/4 1980' FSL & 660' FWL At proposed prod. zone Unit L NW/4 SW4 1980' FSL & 660' FWL		10. Field and Pool, or Exploratory Ingle Wells (Delaware)	
14. Distance in miles and direction from nearest town or post office* Approximately 35 miles from Jal, New Mexico.		11. Sec., T. R. M. or Blk. and Survey or Area Lot L Sec 23, T23S R31E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)		12. County or Parish Eddy County	
16. No. of acres in lease 1320		13. State NM	
17. Spacing Unit dedicated to this well 40			
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.			
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3428'		20. BLM/BIA Bond No. on file	
22. Approximate date work will start* 06/15/2006		23. Estimated duration 45 days	

24. Attachments **Carlsbad Controlled Water Basin**

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature 	Name (Printed/Typed) Stephanie A. Ysasaga	Date 05/31/2006
Title Sr. Staff Engineering Technician		
Approved by (Signature) 	Name (Printed/Typed) Linda S.C. Rundell	Date JUL 19 2006
Title STATE DIRECTOR		
Office NM STATE OFFICE		

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.

APPROVAL FOR 1 YEAR

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.

\*(Instructions on page 2)

Witness Surface &  
Intermediate CasingIf earthen pits are used in  
association with the drilling of this  
well, an OCD pit permit must be  
obtained prior to pit construction.APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS AND  
SPECIAL STIPULATIONS  
ATTACHEDS-17  
29.5



**Additional Operator Remarks:**

Devon Energy Production Company, LP proposes to drill a Delaware well to 8,850' for commercial quantities of oil and gas. If the well is deemed noncommercial, the wellbore will be plugged and abandoned per Federal regulations. Devon Energy Production Co., LP plans to drill the well per the currently attached Drilling and Surface Use Plan.

**Directions:**

From the junction of US SH Hwy 128 & County Road 798 , 34.0 miles west of Jal, go north 2.1 miles on County Road 798 to the southeast corner of Section 23.

**Access Road:**

New construction from the County Road will be used to access the location. Archeological survey included in APD from Don Clifton, Archeological Consultant.

**H2S:**

No H2S is expected to be encountered.



DISTRICT I  
P. O. Box 1980  
Hobbs, NM 88241-1980

DISTRICT II  
P. O. Drawer DD  
Artesia, NM 88211-0719

DISTRICT III  
1000 Rio Brazos Rd.  
Aztec, NM 87410

DISTRICT IV  
P. O. Box 2088  
Santa Fe, NM 87507-2088

State of New Mexico  
Energy, Minerals, and Natural Resources Department

EXHIBIT # 2

Form C-102  
Revised 02-10-94

Instructions on back

Submit to the Appropriate  
District Office  
State Lease - 4 copies  
Fee Lease - 3 copies

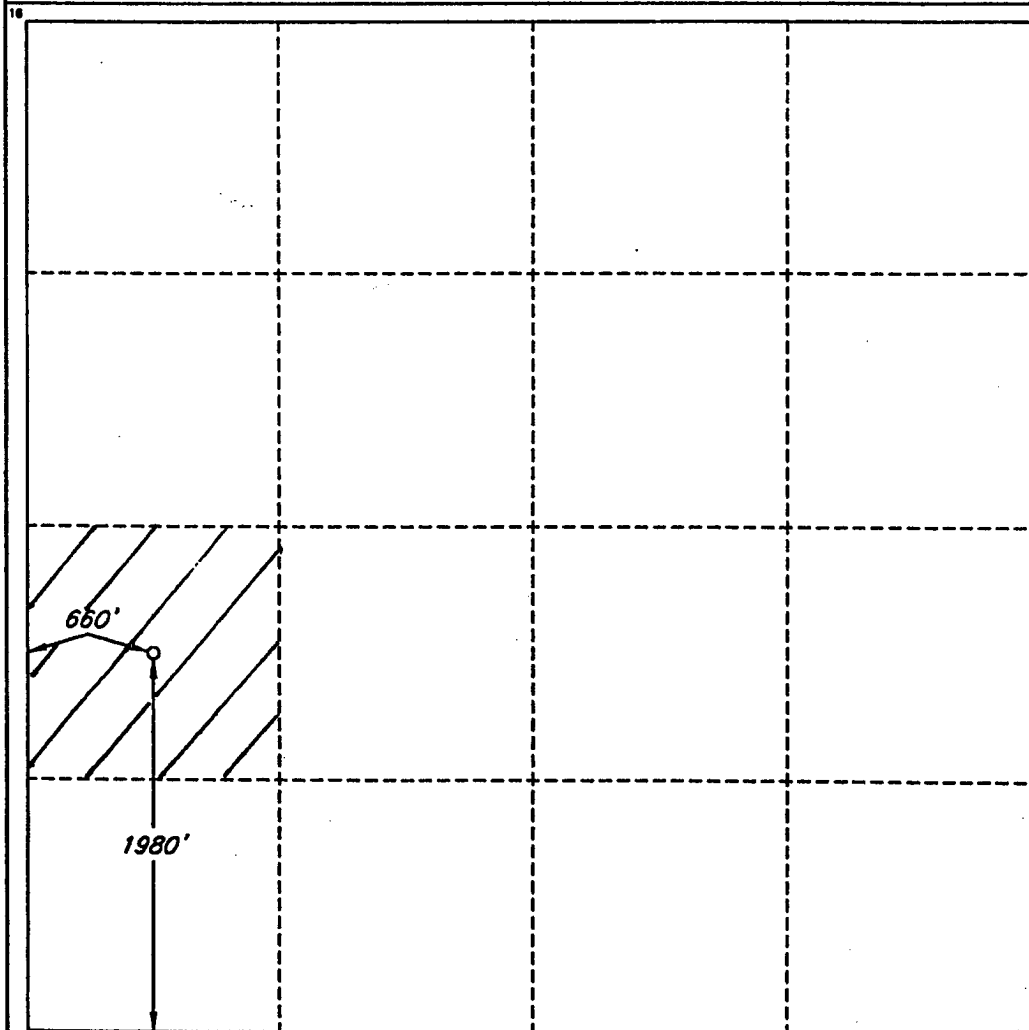
OIL CONSERVATION DIVISION  
P. O. Box 2088  
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-015-32887		2 Pool Code 33745		3 Pool Name Ingle Wells (Delaware)					
4 Property Code		5 Property Name TODD 23 L FEDERAL						6 Well Number 21	
7 OGRID No. 6137		8 Operator Name DEVON ENERGY CORPORATION						9 Elevation 3428'	
10 SURFACE LOCATION									
UL or lot no. L	Section 23	Township 23 SOUTH	Range 31 EAST, N.M.P.M.	Lot Ida	Feet from the 1980'	North/South line SOUTH	Feet from the 660'	East/West line WEST	County EDDY
11 BOTTOM HOLE LOCATION IF DIFFERENT FROM SURFACE									
UL or lot no.	Section	Township	Range	Lot Ida	Feet from the	North/South line	Feet from the	East/West line	County
12 Dedicated Acres 40		13 Joint or Infill		14 Consolidation Code		15 Order No.			

NO ALLOWABLE WELL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN  
CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information  
contained herein is true and complete  
to the best of my knowledge and belief.

Signature

Printed Name

Stephanie A. Ysasaga

Title

Sr. Staff Engineering Tech

Date

05/31/06

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.

Date of Survey

Signature

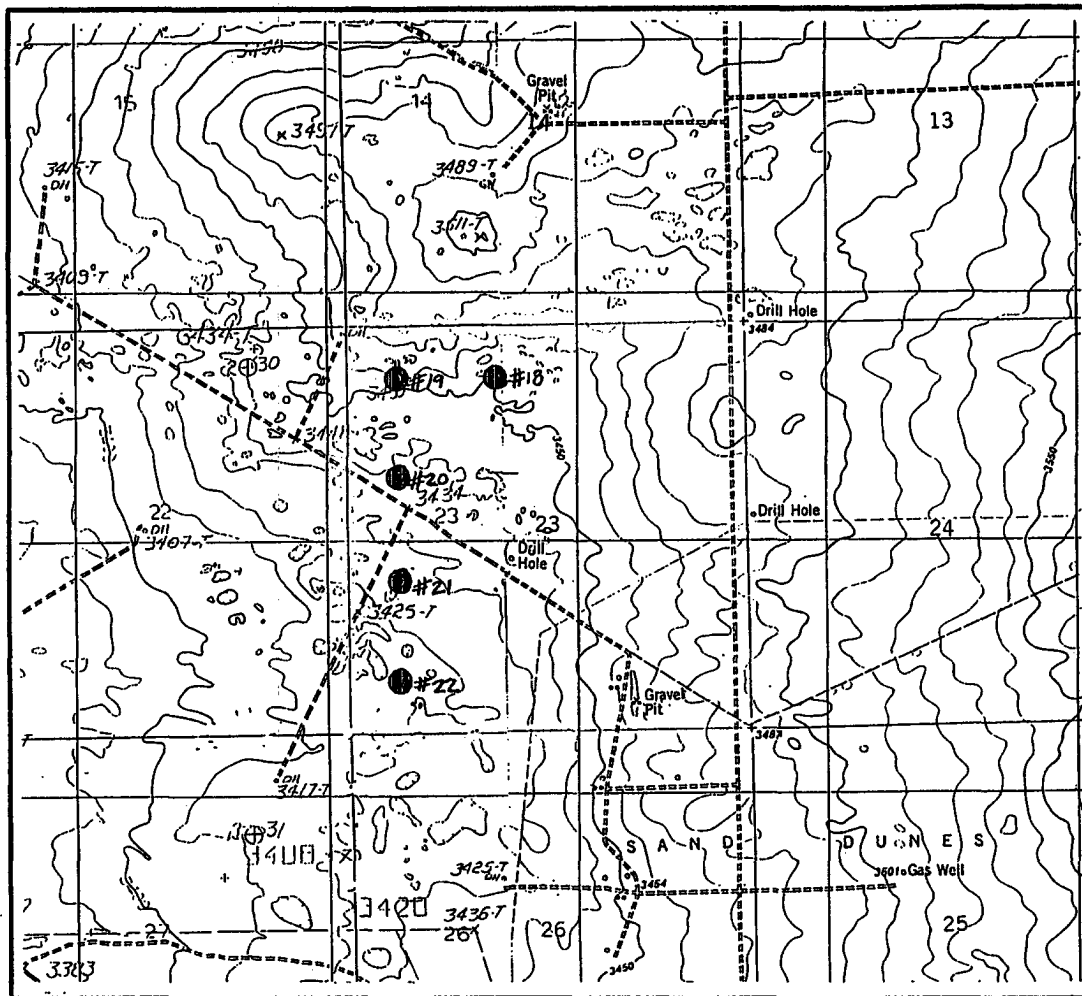
Professional Surveyor

Certificate No.

ROGER M. ROBBINS P.S. #12128

JOB #58478 / 48 SE / V.H.B.





SCALE : 1" = 2000'

CONTOUR INTERVAL 10'

SECTION 23 TWP 23-S RGE 31-ESURVEY NEW MEXICO PRINCIPAL MERIDIANCOUNTY EDDY STATE NMOPERATOR DEVON ENERGY CORPORATION

U.S.G.S. TOPOGRAPHIC MAP

LOS MEDANOS & BOOTLEG RIDGE

NAME	LOCATION	ELEVATION	LAT.	LONG.
TODD 23 C #18	660' FNL & 1980' FWL	3455'	N 32°17'42.9"	W 103°45'00.8"
TODD 23 D #19	660' FNL & 660' FWL	3461'	N 32°17'43.0"	W 103°45'16.2"
TODD 23 E #20	1980' FNL & 660' FWL	3438'	N 32°17'29.9"	W 103°45'16.2"
TODD 23 L #21	1980' FSL & 660' FWL	3428'	N 32°17'16.8"	W 103°45'16.2"
TODD 23 M #22	660' FSL & 660' FWL	3421'	N 32°17'03.7"	W 103°45'16.2"

These locations have been very carefully staked on the ground according to the best official survey records, maps, and other data available to us.

Review this plot and notify us immediately of any possible discrepancy.

## TOPOGRAPHIC LAND SURVEYORS

Surveying &amp; Mapping for the Oil &amp; Gas Industry

1307 N. HOBART  
PAMPA, TX. 790656709 N. CLASSEN BLVD.  
OKLAHOMA CITY, OK. 731162903 N. BIG SPRING  
MIDLAND, TX. 79705



## DRILLING PROGRAM

Attached to Form 3160-3  
Devon Energy Corporation  
TODD "23L" FEDERAL #21  
1980' FSL & 660' FWL  
Section 23-T23S-R31E, Unit L  
Eddy County, New Mexico

1. Geologic Name of Surface Formation

Permian

2. Estimated Tops of Important Geologic Markers

Rustler	800'
Top of Salt	1100'
Base of Salt	3900'
Bell Canyon	4400'
Cherry Canyon	5600'
Brushy Canyon	7000'
Bone Spring Lime	8300'
Total Depth	8800'

3. Estimated Depths of Possible Fresh Water-, Oil-, or Gas-Bearing Formations

Upper Permian Sands	above 800'	fresh water
Delaware (Bell Canyon)	4400'	oil
Delaware (Cherry Canyon)	6000'	oil
Delaware (Brushy Canyon)	8000'	oil

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13 3/8" casing at 850' and circulating cement back to surface. The Potash and Salt intervals will be protected by setting 8 5/8" casing at 4350' and circulating cement to surface. The Delaware intervals will be isolated by setting 5 1/2" casing to total depth and circulating cement above the base of the 8 5/8" casing.



4. Casing Program

Hole Size	Interval	Casing OD	Weight	Grade	Type
30"	0-40'	20"		Conductor	0.30" wall
17 1/2"	0-850'	13 3/8"	48#	H-40	ST&C, new R-3
11"	0-4350'	8 5/8"	32#	J-55	ST&C, new R-3
7 7/8"	0'-TD (8800'±)	5 1/2"	15.5# & 17#	J-55	LT&C, new R-3

Cementing Program

20" Conductor Casing	Cement with Ready-mix to surface.
13 3/8" Surface Casing WITNESS	Cement to surface using 500 sx Poz (35% Poz, 65% Class C, 6% gel) with 2% CaCl <sub>2</sub> and 1/4 lb/sx Cellophane flakes + 200 sx Class C with 2% CaCl <sub>2</sub> and 1/4 lb/sx Cellophane flakes.
8 5/8" Intermediate Casing WITNESS	Cement to surface using 1600 sx Poz (35% Poz, 65% Class C, 6% gel, 15% salt) with 1/4 lb/sx Cellophane flakes + 200 sx Class C with 2% CaCl <sub>2</sub> , 1/4 lb/sx Cellophane flakes
5 1/2" Production Casing with DV tool at ±5500'	Cement 1st stage with 525 sx Silica Lite (Class H) with 3% salt, 0.6% FL additive, 1/4 lb/sx Cellophane flakes Cement 2nd stage with 225 sx Poz (35% Poz, 65% Class H, 6% gel) with 1/4 lb/sx Cellophane flakes + 400 sx Class H with 4% gel, 5% salt, 1/4 lb/sx Cellophane flakes.

The above cement volumes could be revised pending the caliper measurement from the open hole logs. The top of cement is designed to reach 450'± above the 8 5/8" casing seat at 4350'.

5. Minimum Specifications for Pressure Control

The blowout preventer equipment (BOP) shown in Exhibit #1 will consist of a (3M system) double ram type (2000 psi WP) preventer and a bag-type (Hydril) preventer (2000 psi WP). Both units will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4 1/2" drill pipe rams on bottom. Both BOP's will be installed on the 13 3/8" surface casing and utilized continuously until total depth is reached. All BOP's and associated equipment will be tested to 1200 psi



before drilling out the 13 3/8" casing shoe (70% of 48# H-40 casing). Prior to drilling out the 8 5/8" casing shoe, the BOP's and Hydril will be function tested as per BLM drilling Operations Order #2.

Pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These functional tests will be documented on the daily drillers log. A 2" kill line and 3" choke line will be incorporated in the drilling spool below the ram-type BOP. Other accessory BOP equipment will include a kelly cock, floor safety valve, choke lines and choke manifold having 3000 psi WP rating.

6. Types and Characteristics of the Proposed Mud System

The well will be drilled to total depth using brine, cut brine and polymer mud systems. Depths of systems are as follows.

Depth	Type	Weight (ppg)	Viscosity (1/sec)	Water Loss (cc/30 mins)
0-850'	Fresh water	8.8	34-36	No control
850-4350'	Brine water	10.0	28	No control
4350'-TD	Fresh water polymer	8.8	32-36	10-20

The necessary mud products for weight addition and fluid loss control will be on location at all times.

7. Auxiliary Well Control and Monitoring Equipment

- A. A kelly cock will be in the drill string at all times.
- B. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- C. Hydrogen Sulfide detection equipment (Compliance Package) will be in operation when drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented.



8. Logging, Testing and Coring Program

A. Drill stem tests will be based on geological sample shows.

B. The open hole wireline logging program will be as follows.

TD to intermediate casing: Induction / Gamma Ray / Neutron / Density Log.

TD to surface: Neutron with Gamma Ray.

C. Rotary sidewall cores are planned.

D. Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

9. Abnormal Pressures, Temperatures and Potential Hazards

No abnormal pressures or temperatures are foreseen. The anticipated bottom hole temperature at total depth is approximately 130 degrees and maximum bottom hole pressure is approximately 2900 psig. No hydrogen sulfide gas has been reported or is known to exist at these depths in this area. No major lost circulation intervals have been encountered in adjacent wells.

10. Anticipated Starting Date and Duration of Operations

A Cultural Resources Examination will be completed by Don Clifton Archaeological Consultant, and submitted to the BLM. Road and location preparation will not be undertaken until approval has been received from the BLM. If approved, the anticipated spud date for the well will be in *June 2006*. The drilling operation should require approximately 21 days. If the well is deemed productive, completion operations will require, at minimum, an additional 30 days of testing to ascertain whether permanent production facilities will be constructed.



## **SURFACE USE PLAN**

Devon Energy Production Company, LP

### **Todd 23L Federal 21**

Surface Location: 1980' FSL & 660' FWL, Unit L, Sec 23 T23S R31E, Eddy, NM

Bottom hole Location: 1980' FSL & 660' FWL, Unit L, Sec 23 T23S R31E, Eddy, NM

#### **1. Existing Roads:**

- a. The well site and elevation plat for the proposed Todd 23L Federal 21 are reflected on Exhibit 2. This well was staked by Topographic Land Surveyors of Midland, Texas.
- b. All roads into the location are depicted on Exhibit 3. New construction from the County road will be used to access the location. New construction will conform to the specifications outlined in item 2 below.
- c. Directions to Location: Travel west-northwest from Jal, NM approximately 35 miles on State Highway #128 to County Road #798, just into Eddy County from Lea County. Turn north (right) on County Road #798 and travel approximately 2.25 miles. Then, turn left (west) onto existing lease road. Go approximately 0.25 mile and veer northwest approximately 0.30 mile to Todd 23K Federal 12. Turn left (west) and go approximately 0.25 mile to proposed Todd 23L Federal 21 location.

#### **2. Access Road**

Access to this location will require the construction of approximately 1320' of new access road from the County road. All new road construction would adhere to the following specification:

- a. The maximum width of the road will be 15'.
- b. It will be crowned and made of 6" of rolled and compacted caliche. Water will be deflected, as necessary, to avoid accumulation and prevent surface erosion.
- c. Surface material will be native caliche. This material will be obtained from a BLM approved pit nearest in proximity to the location.
- d. The average grade will be approximately 1%.
- e. No cattle guards, grates or fence cuts will be required.
- f. No turnouts are planned.

#### **3. Location of Existing and/or Proposed Facilities**

Exhibit 4 shows all existing wells within a one-mile radius of the proposed Todd 23L Federal 21.

#### **4. Location of Existing and/or Proposed Facilities**

- a. In the event the well is found productive, a tank battery would be constructed.
- b. The tank battery, all connections and all lines will adhere to API standards.
- c. If necessary, the well will be operated by means of an electric prime mover. Electric power poles will be set along side of the access road.
- d. If the well is productive, rehabilitation plans are as follows:
  - i. The reserve pit will be back-filled after the contents of the pit are dry (within 120 days after completion, weather permitting).
  - ii. The original topsoil from the well site will be returned to the location. The drill site will then be contoured as close as possible to the original natural state.



**5. Methods of Handling Waste Material:**

- a. Drill cuttings will be disposed of in the reserve pits.
- b. All trash, junk and other waste material will be contained in trash cages or trash bins to prevent scattering. When the job is completed all contents will be removed and disposed of in an approved sanitary landfill.
- c. The supplier, including broken sacks, will pick up salts remaining after completion of well.
- d. Wastewater from living quarters will be drained into hole with a minimum of 10'. These holes will be covered during drilling and will be back filled when the well is completed. A Porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.
- e. Remaining drilling fluids will be allowed to evaporate in the reserve pits until the pits are dry enough to be broken out for further drying. If the drilling fluids do not evaporate in a reasonable time they will be hauled off by transports to a state approved disposal site. Later pits will be broken out to speed dry. Water produced during completion will be put in reserve pits. Oil and condensate produced will be put in a storage tank and sold.

**6. Well Site Layout**

- a. Exhibit D Shows the proposed well site layout.
- b. This exhibit indicated proposed location of reserve and sump pits and living facilities.
- c. Mud pits in the active circulating system will be steel pits & the reserve pit is proposed to be unlined unless subsurface conditions encountered during pit construction indicate that lining is needed for lateral containment of fluids.
- d. If needed, the reserve pit is to be lined with polyethylene. The pit liner will be 6 mils thick. Pit liner will extend a minimum 2'00" over the reserve pits dikes where the liner will be anchored down.
- e. The reserve pit will be fenced on three sides with four strands of barbed wire during drilling and completion phases. The fourth side will be fenced after all drilling operations have ceased. If the well is a producer, the reserve pit fence will be torn down. The reserve pit and those areas of the location not essential to production facilities will be reclaimed and seeded per BLM requirements.

**7. Other Information:**

- a. The area surrounding the well site is grassland. The topsoil is very sandy in nature. The vegetation is moderately sparse with native prairie grass, some mesquite bushes and shinnery oak. No wildlife was observed but it is likely that deer, rabbits, coyotes, and rodents traverse the area.
- b. The surface is owned by the State and the mineral estate is administered by the Bureau of Land Management. The surface is of limited use except for the grazing of livestock and the production of oil and gas.
- c. A Cultural Resources Examination will be completed by Southern New Mexico Archaeological Services, Inc. and forwarded to the BLM office in Carlsbad, New Mexico.
- d. There are no dwellings within 2 miles of location.



**Operators Representative:**

The Devon Energy Production Company, L.P. representatives responsible for ensuring compliance of the surface use plan are listed below.

Jim Blount  
Operations Engineer Advisor

Don Mayberry  
Superintendent

Devon Energy Production Company, L.P.  
20 North Broadway, Suite 1500  
Oklahoma City, OK 73102-8260

Devon Energy Production Company, L.P.  
Post Office Box 250  
Artesia, NM 88211-0250

(405) 228-4301 (office)  
(405) 834-9207 (Cellular)

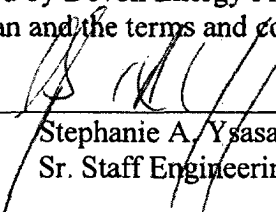
(505) 748-3371 (office)  
(505) 746-4945 (home)

**Certification**

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access road; that I am familiar with the conditions that presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Devon Energy Production Company, L.P. and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

Signed: \_\_\_\_\_

Date: May 31<sup>st</sup>, 2006

  
Stephanie A. Ysasaga  
Sr. Staff Engineering Technician



## DEVON ENERGY

Operator: DEVON ENERGY CORP	Well Name: TODD FEDERAL AREA
Project ID:	Location: T23S-R31E

Design Parameters:

Mud weight ( 9.00 ppg ) : 0.448 psi/ft  
 Shut in surface pressure : 765 psi  
 Internal gradient (burst) : 0.100 psi/ft  
 Annular gradient (burst) : 0.000 psi/ft  
 Tensile load is determined using air weight  
 Service rating is "Sweet"

Design Factors:

Collapse : 1.125  
 Burst : 1.00  
 S Round : 1.80 (J)  
 Buttress : 1.40 (J)  
 Body Yield : 1.50 (B)  
 Overpull : 0 lbs.

Length (feet)	Size (in.)	Weight (lb/ft)	Grade	Joint	Depth (feet)	Drift (in.)	Cost		
1	850	13-3/8	48.00	H-40	ST&C	850	12.559		
	Collapse			Burst Load (psi)	Min Int Strgth (psi)	Yield S.F.	Tension		
	Load (psi)	Strgth (psi)	S.F.				Load (kips)	Strgth (kips)	S.F.
1	397	740	1.864	850	1730	2.04	40.80	322	7.89 J

Prepared by : CHUCK HORSMAN, Oklahoma City, OK

Date : 06-04-1993

Remarks :

Minimum segment length for the 850 foot well is 800 feet.

Surface string:

Next string will set at 4,400 ft. with 10.00 ppg mud (pore pressure of 2,286 psi.) The frac gradient of 1.000 at the casing seat results in an injection pressure of 850 psi. Effective BHP (for burst) is 850 psi.

**NOTE:** The design factors used in this casing string design are as shown above. As a general guideline, Lone Star Steel recommends using minimum design factors of 1.125 - Collapse (with evacuated casing), 1.0 - Burst, 1.8 - S Round Tension, 1.4 - Buttress Tension, and 1.5 - Body Yield. Collapse strength under axial tension was calculated based on the Westcott, Dunlop and Kessler curve. Engineering responsibility for use of this design will be that of the purchaser. Costs for this design are based on a 1990 pricing model. (Version 1.0G)



## DEVON ENERGY

Operator: DEVON ENERGY CORP	Well Name: TODD FEDERAL AREA
Project ID:	Location: T23S-R31E

Design Parameters:

Mud weight (9.80 ppg) : 0.509 psi/ft  
 Shut in surface pressure : 3487 psi  
 Internal gradient (burst) : 0.100 psi/ft  
 Annular gradient (burst) : 0.000 psi/ft  
 Tensile load is determined using air weight  
 Service rating is "Sweet"

Design Factors:

Collapse : 1.125  
 Burst : 1.00  
 8 Round : 1.80 (J)  
 Buttress : 9.89 (J)  
 Body Yield : 1.50 (S)  
 Overpull : 0 lbs.

Length (feet)	Size (in.)	Weight (lb/ft)	Grade	Joint	Depth (feet)	Drift (in.)	Cost		
1	4,400	8-5/8"	32.00	J-55	ST&C	4,400	7.875		
	Load (psi)	Collapse Strgth (psi)	S.F.	Burst Load (psi)	Min Int Strgth (psi)	Yield S.F.	Load (kips)	Tension Strgth (kips)	S.F.
1	2240	2530	1.129	3527	3930	1.11	140.80	372	2.64 J

Prepared by : CHUCK HORSMAN, Oklahoma City, OK

Date : 06-04-1993

Remarks :

Minimum segment length for the 4,400 foot well is 800 feet.

Surface/Intermediate string:

Next string will set at 8,400 ft. with 9.00 ppg mud (pore pressure of 3,927 psi.) The frac gradient of 1.000 at the casing seat results in an injection pressure of 4,400 psi. Effective BHP (for burst) is 3,527 psi.

**NOTE:** The design factors used in this casing string design are as shown above. As a general guideline, Lone Star Steel recommends using minimum design factors of 1.125 - Collapse (with evacuated casing), 1.0 - Burst, 1.8 - 8 Round Tension, 1.6 - Buttress Tension, and 1.5 - Body Yield. Collapse strength under axial tension was calculated based on the Westcott, Dunlop and Komler curve. Engineering responsibility for use of this design will be that of the purchaser. Costs for this design are based on a 1990 pricing model. (Version 1.06)



## DEVON ENERGY

Operator: DEVON ENERGY CORP	Well Name: TODD FEDERAL AREA
Project ID:	Location: T23S-R31E

Design Parameters:

Mud weight ( 9.88 ppg) : 0.468 psi/ft  
 Shut in surface pressure : 3216 psi  
 Internal gradient (burst) : 0.100 psi/ft  
 Annular gradient (burst) : 0.000 psi/ft  
 Tensile load is determined using air weight  
 Service rating is "Direct"

\*\*\* WARNING \*\*\* Design factor for joint strength exceeded in design!

Design Factors:

Collapse : 1.125  
 Burst : 1.00  
 8 Round : 1.80 (J)  
 Buckress : 9.89 (J)  
 Body Yield : 1.50 (B)  
 Overpull : 0 lbs.

	Length (feet)	Size (in.)	Weight (lb/ft)	Grade	Joint	Depth (feet)	Drift (in.)	Cost
1	1,200	5-1/2"	17.00	J-55	LT&C	1,200	4.767	
2	6,200	5-1/2"	15.50	J-55	LT&C	7,400	4.825	
3	1,350	5-1/2"	17.00	J-55	LT&C	8,750	4.767	

	Collapse			Burst			Tension		
	Load	Strgth	S.F.	Load	Min Int Strgth	Yield S.F.	Load	Strgth	S.F.
	(psi)	(psi)		(psi)	(psi)		(kips)	(kips)	
1	561	3897	6.947	3336	5320	1.59	139.45	247	1.77 J
2	3460	3927	1.135	3956	4810	1.22	119.05	217	1.82 J
3	4091	4910	1.200	4091	5320	1.30	22.95	247	10.76 J

Prepared by : TOM PEPPER, Oklahoma City, OK

Date : 07-10-1995

Remarks :

Minimum segment length for the 8,750 foot well is 500 feet.

The mud gradient and bottom hole pressures (for burst) are 0.468 psi/ft and 4.091 psi, respectively.

NOTE: The design factors used in this casing string design are as shown above. As a general guideline, Lone Star Steel recommends using minimum design factors of 1.125 - Collapse (with evacuated casing), 1.0 - Burst, 1.8 - 8 Round Tension, 1.5 - Buckress Tension, and 1.5 - Body Yield. Collapse strength under axial tension was calculated based on the Westcott, Dunlop and Reamer curve. Engineering responsibility for use of this design will be that of the purchaser. Costs for this design are based on a 1990 pricing model. (Version 1.00)



# **DEVON ENERGY CORPORATION**

## **HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

### **A. Hydrogen Sulfide Training**

All rig crews and company personnel will receive training from a qualified instructor in the following areas prior to penetrating any hydrogen sulfide bearing formations during drilling operations:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S).
2. The proper use and maintenance of the H<sub>2</sub>S safety equipment and of personal protective equipment to be utilized at the location such as H<sub>2</sub>S detection monitors, alarms and warning systems, and breathing equipment. Briefing areas and evacuation procedures will also be discussed and established.
3. Proper rescue techniques and procedures will be discussed and established.

In addition to the above, supervisory personnel will be trained in the prevention of oil and gas well blowouts in accordance with Minerals Management Service Standards Subpart - 0 - 250 - 212.

Prior to penetrating any known H<sub>2</sub>S bearing formation, H<sub>2</sub>S training will be required at the rig sight for all rig crews and company personnel that have not previously received such training. This instruction will be provided by a qualified instructor with each individual being required to pass a 20 question test regarding H<sub>2</sub>S safety procedures. All contract personnel employed on an unscheduled basis will be required to have received appropriate H<sub>2</sub>S training.

This Hydrogen Sulfide Drilling And Operations Plan shall be available at the wellsite during drilling operations.

### **B. H<sub>2</sub>S Safety Equipment And Systems**

All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling operations reach a depth approximately 500' above any known or probable H<sub>2</sub>S bearing formation. The safety systems to be utilized during drilling operations are as follows:



**1. Well Control Equipment**

- (a) Double ram BOP with a properly sized closing unit and pipe rams to accommodate all pipe sizes in use.
- (b) A choke manifold with a minimum of one remote choke.

**2. H2S Detection And Monitoring Equipment**

- (a) Three (3) H2S detection monitors will be placed in service at the location. One monitor will be placed near the bell nipple on the rig floor; one will be placed at the rig substructure; and, one will be at the working mud pits or shale shaker. This monitoring system will have warning lights and audible alarms that will alert personnel when H2S levels reach 10 ppm.
- (b) One (1) Sensidyne Pump with the appropriate detection tubes will also be available to perform spot checks for H2S concentrations in any remote or isolated areas.

**3. Protective Equipment For Essential Personnel**

Protective equipment will consist of the following:

- (a) Four (4) - five minute escape packs located at strategic points around the rig.
- (b) Two (2) - thirty minute rescue packs to be located at the designated briefing areas.

**4. Visual Warning System**

Visual warning system will consist of the following:

- (a) Two wind direction indicators.
- (b) One condition / warning sign which will be posted on the road providing direct access to the location. The sign will contain lettering of sufficient size to be readable at a reasonable distance from the immediate location. The sign will inform the public that a hydrogen sulfide gas environment could be encountered at the location.



**5. Mud Program**

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight and safe drilling practices (for example, keeping the hole filled during trips) will minimize hazards when drilling in H<sub>2</sub>S bearing formations.

**6. Metallurgy**

All drill strings, casings, tubing, wellhead, blowout preventers, drilling spools, kill lines, choke manifold and lines and valves shall be suitable for H<sub>2</sub>S service.

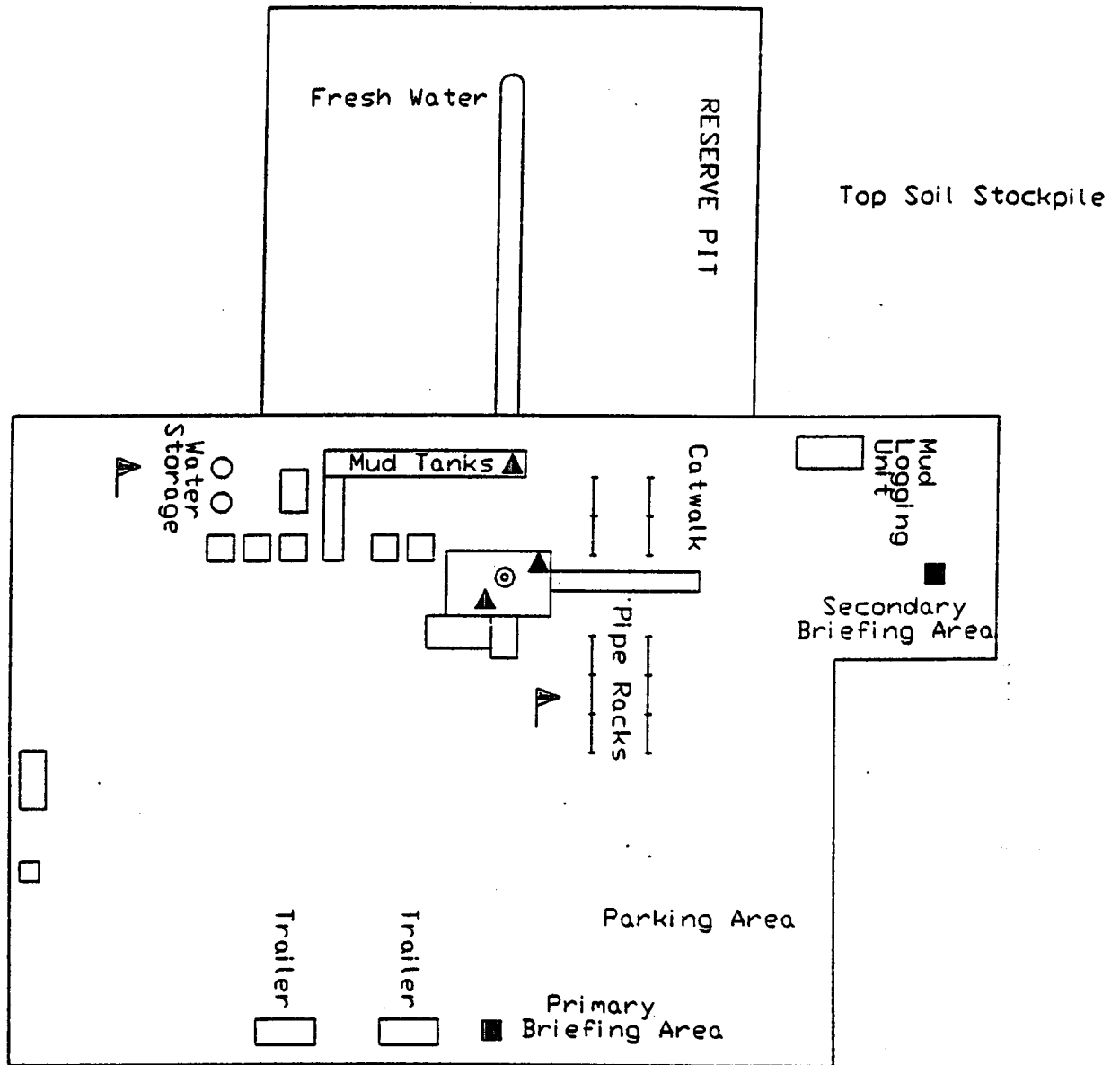
**7. Communication**

Cellular telephone communication will be available in company vehicles.

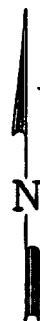
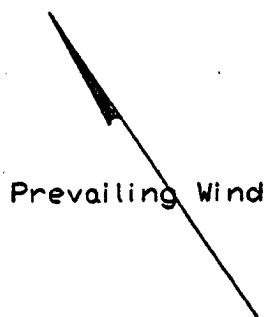
**C. Diagram of Drilling Location**

Attached is a diagram representing a typical location layout as well as the location of H<sub>2</sub>S monitors, briefing areas and wind direction indicators.





- ▲ H2S MONITORS WITH ALARMS AT THE BELL NIPPLE, SUBSTRUCTURE, AND SHALE SHAKER
- ▲ WIND DIRECTION INDICATORS
- SAFE BRIEFING AREAS WITH CAUTION SIGNS AND PROTECTIVE BREATHING EQUIPMENT



**devon**

---

EDDY COUNTY, NEW MEXICO

---

**H2S PLAN**

---

Scale in Feet

25      0      25      50      75      100

4/97



## RESERVE PIT CONSTRUCTION STANDARDS

The reserve pit shall be constructed entirely in cut material and lined with 6-mil plastic. Mineral material extracted from within the boundary of the APD during construction of the well pad and reserve pits and be used for the construction of this well pad and its immediate access road only, as long as that portion of the access road it is use on remains on-lease. Removal of any additional material from this location for construction or improvement of other well pads and other access or lease roads must first be purchased from BLM.

Reclamation: Reclamation of this type of deep pit will consist of pushing the pit walls into the pit when sufficiently dry to support track equipment. The pit liner is NOT TO BE RUPTURED to facilitate drying; a ten month period after completion of the well is allowed for drying of the pit contents.

The pit area must be contoured to the natural terrain with all contaminated drilling mud buried with at least 3 feet of clean soil. The reclaimed area will then be seeded as specified in this permit.

## OPTIONAL PIT CONSTRUCTION STANDARDS

The reserve pit may be constructed in predominantly fill material if:

- (1) Lined as specified above and
- (2) A temporary or emergency pit may be constructed immediately adjacent to the reserve pit as long as the pit remains within the APD boundary. Mineral material removed from this pit may be used for the construction of this well pad only and its immediate access road, as long as that portion of the access road the material is used on remains on-lease. Removal of any material from the APD boundary for use on other well locations or roads must first be purchased from BLM.

Reclamation of the reserve pit consists of bulldozing all reserve pit contents and contaminants into the borrow pit and covering with a minimum of 3 feet of clean soil material. The entire area must be re-contoured, all trash removed, and reseeded as specified in this permit.

## CULTURAL

Whether or not an archaeological survey has been completed and notwithstanding that operations are being conducted as approved, the lessee/operator/grantee shall notify the BLM immediately if previously unidentified cultural resources are observed during surface disturbing operations. From the time of the observation, the lessee/operator/grantee shall avoid operations that will result in disturbance to these cultural resources until directed to process by BLM.

## TRASH PIT STIPS

All trash, junk, and other waste material shall be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Burial on site is not permitted.



## CONDITIONS OF APPROVAL - DRILLING

Operator's Name: Devon Energy Production Company  
Well Name & No. Todd 23L Federal # 21  
Location: 1980' FSL, 660' FWL, Section 23, T. 23 S., R. 31 E., Eddy County, New Mexico  
Lease: NM-0405444

### II. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 361-2822 for wells in Eddy County in sufficient time for a representative to witness:

- A. Well spud
- B. Cementing casing: 13-3/8 inch 8-5/8 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 approximately 850 feet in the top of the Rustler anhydrite 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 8-5/8 inch intermediate casing is to be sufficient to circulate to the surface.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is to be sufficient to reach approximately 500 feet above the base of the 8-5/8 inch casing shoe.

4. Whenever a casing string is cemented in the R-111-P Potash Area, cement shall be allowed to stand a minimum of twelve (12) hours under pressure and a total of twenty-four (24) hours before drilling the plug or initiating tests.

### 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) shall be 3000 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.