Form 3160-3 (April 2004) OCD-ARTESIA

UNITED STATES

OMB No. 1004-0137 Expires March 31, 2007

## Lease Serial No.

#### DEPARTMENT OF THE INTERIOR NMNM-63011 BUREAU OF LAND MANAGEMENT 6. If Indian, Allotee or Tribe Name APPLICATION FOR PERMIT TO DRILL OR REENTER 7. If Unit or CA Agreement, Name and No. DRILL REENTER la. Type of work: 8. Lease Name and Well No. Oil Well Gas Well ✓ Single Zone Multiple Zone lb. Type of Well: Roadrunner 11 Fed Com I 9. API Well No. Name of Operator 23456 **Devon Energy Production Company, LP** 10. Field and Pool, or Exploratory 3a. Address 20 North Broadway 405-55227802 Oklahoma City, Oklahoma City 73102-8260 Lusk; Morrow (Gas) 4. Location of Well (Report location clearly and in accordance with any State req Sec., T. R. M. or Blk. and Survey or Area AUG 2006 SWSW 660' FSL & 860' FWL At surface RECEIVED Lot M Sec 11 T19S R31E At proposed prod. zone SWSW 660' FSL & 860' FWL OCD - ARTESIA 13. State 2. County or Parish 14. Distance in miles and direction from nearest town or post office\* Approximately 35 miles northeast of Carlsbad, NM **Eddy County** NM Distance from proposed 16. No. of acres cing Unit dedicated to this well 9202138 location to nearest property or lease line, ft. 160 (Also to nearest drig. unit line, if any) 20. BLM/BIA Bond No. on file Distance from proposed location\* to nearest well, drilling, completed, applied for, on this lease, ft. 19. Proposed Depth 22 Approximate date work will start\* Elevations (Show whether DF, KDB, RT, GL, etc.) 3565' GL 06/15/2006 45 days 24. Attachments Capitan Controlled Water Best The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall be attached to this form: Bond to cover the operations unless covered by an existing bond on file (see 1. Well plat certified by a registered surveyor. Item 20 above). 2. A Drilling Plan. 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). Operator certification Such other site specific information and/or plans as may be required by the authorized officer. Name (Printed/Typed) 25. Signature Stephanie A. Ysasaga 06/12/2006 Title Sr. Staff Engineering Technician

ACTINE Title FIELD MANAGER

Don Peterson

AUS 0 2 2008

/s/ Don Peterson

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. APPROVAL FOR 1 YEAR

Office

Conditions of approval, if any, are attached.

y (Signature)

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.

Name (Printed/Typed)

Approved

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

<sup>\*(</sup>Instructions on page 2)

DISTRICT I 1825 N. French Dr., Bobbs, NM 88240 DISTRICT II 811 South First, Artesia, NM 88210

#### State of New Mexico

Energy, Minerals and Natural Resources Department

Form C-102 Revised March 17, 1999

Submit to Appropriate District Office

State Lease - 4 Copies Fee Lease - 3 Copies

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

#### DISTRICT IV 2040 South Pacheco, Santa Fe, NM 87505

#### OIL CONSERVATION DIVISION

2040 South Pacheco Santa Fe, New Mexico 87504-2088

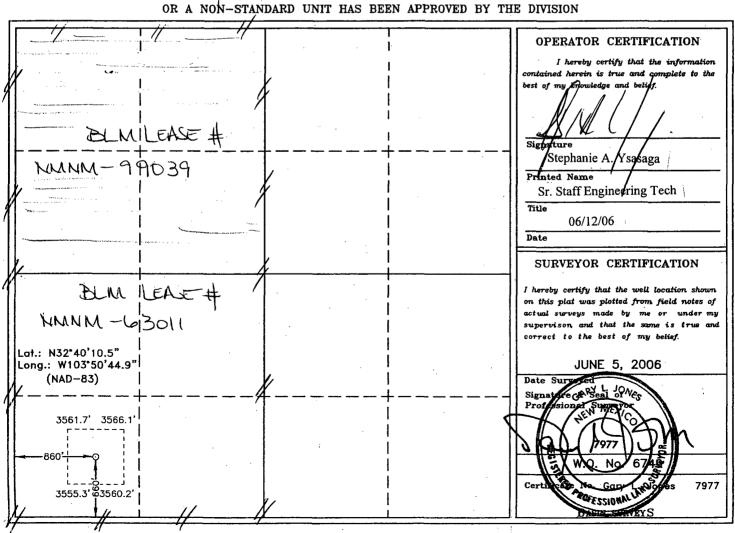
☐ AMENDED REPORT

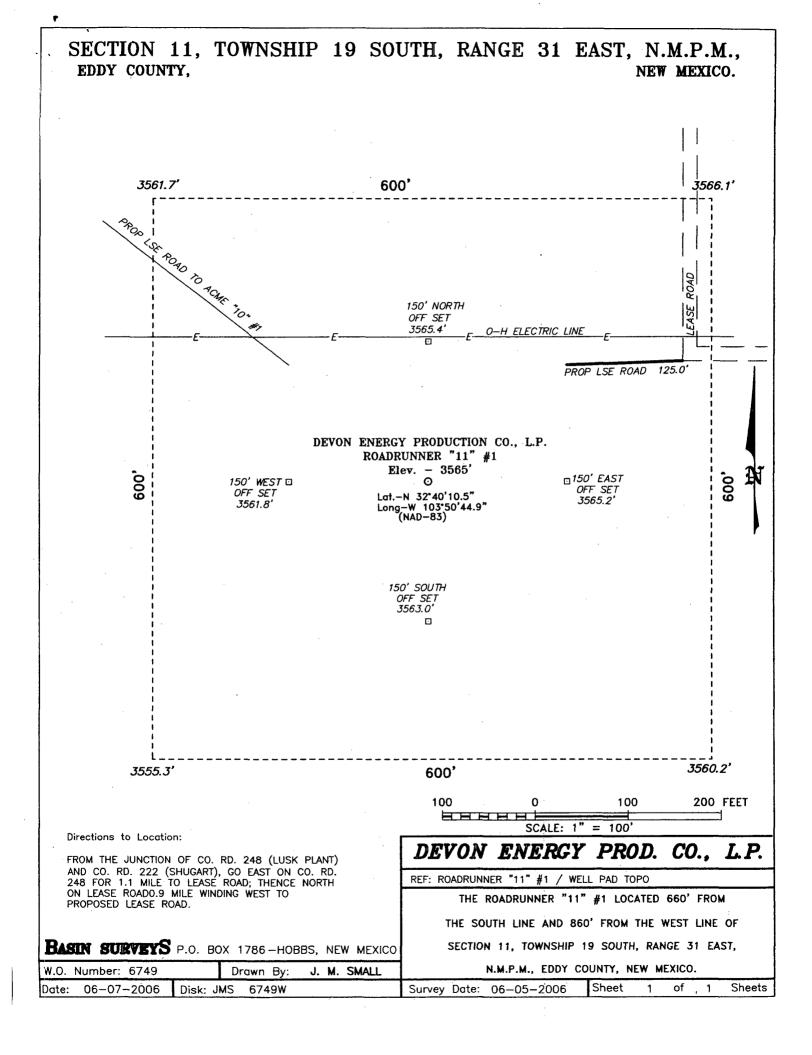
#### WELL LOCATION AND ACREAGE DEDICATION PLAT

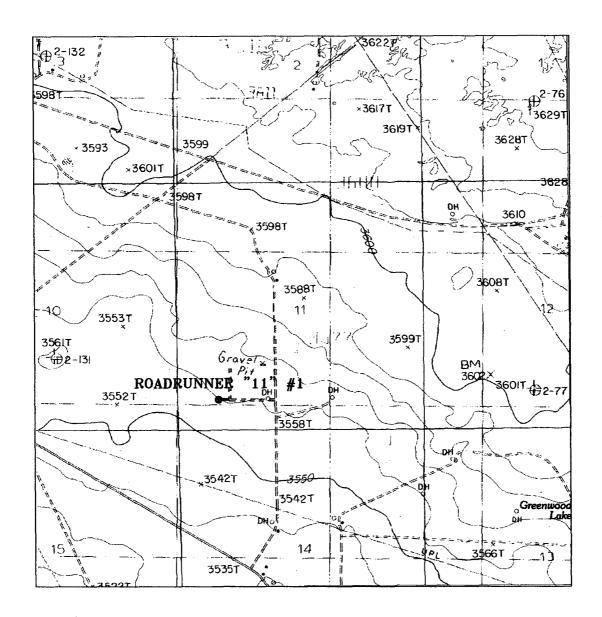
API	Number		8	Pool Code O 84(	D Pool Name Lusk; Morrow (Gas)				
Property Code Proper						me		Well N	umber
ROADRUI					OADRUNNER	JNNER "11" FED COM 1			•
OGRID No. Operator Name						me		Eleva	tion
6137			DEVON ENERGY PRODUCTION COMPANY LP 3565'						5'
Surface Location									
UL or lot No.	Section	Township	Range	Lot Idn .	Feet from the	North/South line	Feet from the	East/West line	County
М	11	19 S	31 E		660	SOUTH	860	WEST	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
Dedicated Acres   Joint or Infill   Consolidation Code   Order No.									

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









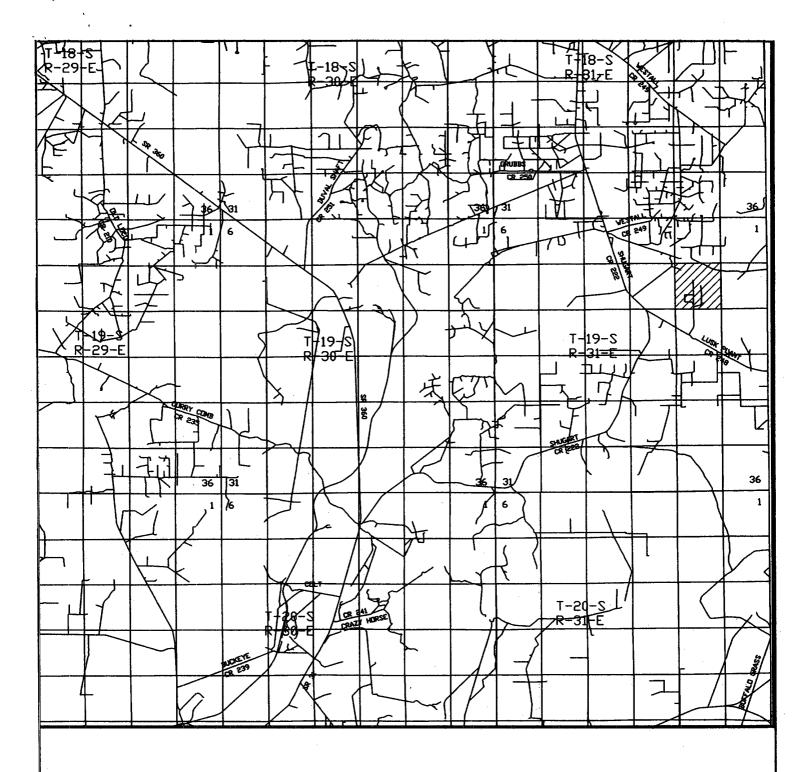
Located at 660' FSL AND 860' FWL Section 11, Township 19 South, Range 31 East, N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786 1120 N. West County Rd. Hobbs, New Mexico 88241 (505) 393-7316 - Office (505) 392-3074 - Fax basinsurveys.com

W.O. Number:	6749	JMS	
Survey Date:		-2006	
Scale: 1" = 2			***************************************
Date: 06-07		No. 22 Acres 1987 Principles	

DEVON ENERGY PROD. CO., L.P.



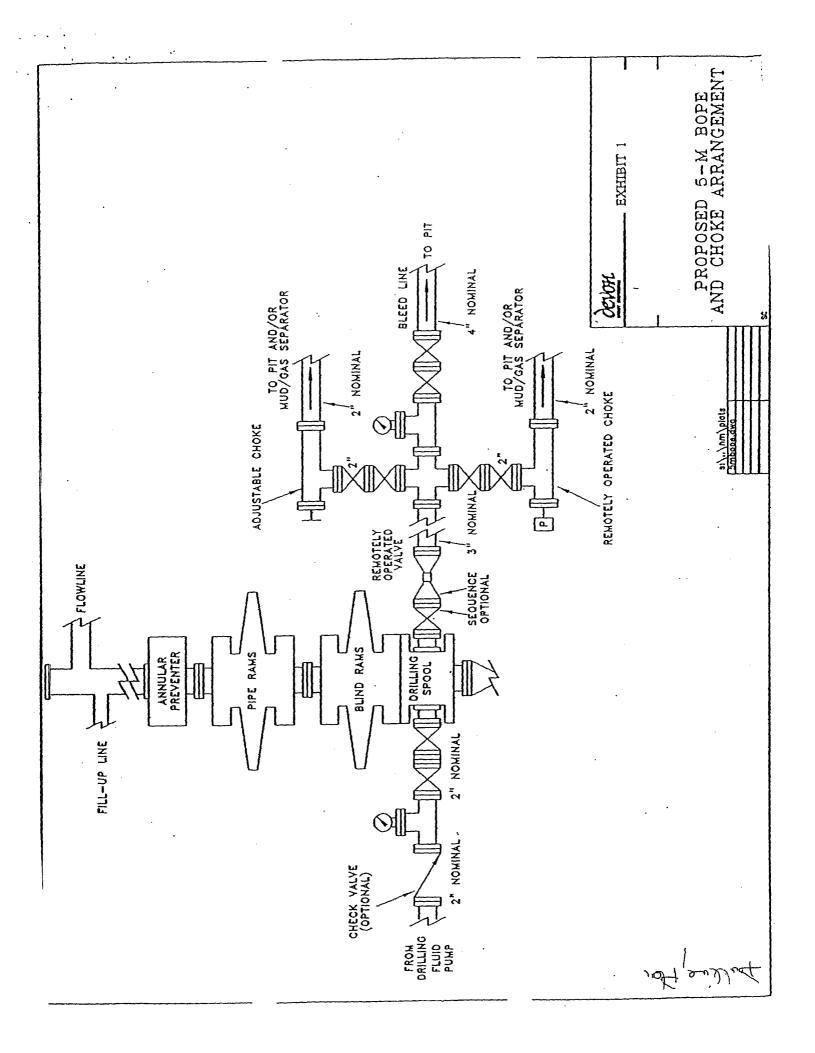
ROADRUNNER "11" #1
Located at 660' FSL AND 860' FWL
Section 11, Township 19 South, Range 31 East,
N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786 1120 N. West County Rd. Hobbs, New Mexico 88241 (505) 393-7316 - Office (505) 392-3074 - Fax basinsurveys.com

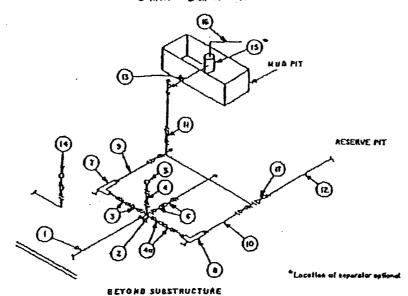
W.O. Number:	6749	JMS			
	06-05				
Scale: 1" = 2000'					
Date: 06-07-	-2006				

DEVON ENERGY PROD. CO., L.P.



#### MINIMUM CHOKE MANAFOLD 3,000, 5,000 and 10,000 PSI Working Procesure

J MWP - S MWP - 10 MWP



			MINI	MUM REQ	UIREMENT	3				
	T	•	9,000 MWP		1	5,000 MWP		1	10,000 MW	>
Na.	1	LD.	HOMINAL	RATING	1.0.	HOMINAL	RATING	LD.	NOMINAL	RATING
1	Line from drilling spool		3-	3,000		3,	5,000		3"	10,000
2	Cross3*c3*x3*x2*			3,000			5,000			
_	Cross 2,x3,x3,x3,									10,000
3	Velves(1) Gate [] Play [](2)	3-1/8*		3,000	3-1/8"		5,000	3-1/8*		10,000
4	Valve Gale [] Ptog [](2]	1-13M6"		3,000	1-13/16*		5,000	1-13/16"		10,000
48	Values(1)	2-1/16*		3,000	2-1/16"		5,000	3-1/8*		10,000
5	Pressure Geuge			3,000	•		5,000			10,000
6	Valves Gate [] Valves Plug [](2)	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	Actiustable Choke	1-		3,000	1*	1	5,000	2-		10,000
9	Line		3"	3,000		3"	5,000		3-	10,000
10	Line		2"	3,000		2"	\$,000		3"	10,000
11	Valves Plug □(2)	3-1/8"		3,900	3-1/8*		5,000	3-1/8"		10,000
12	Lines		3*	1,000		3.	1.000		3.	2,000
13	Lines		3.	1,000		3.	1,000		3"	2,000
14	Remale reading compound standpine pressure pauge			000,0			5.000	•		10,000
15	Gas Separator		275*			2:5			275"	
16	Line		4*	1,000		1"	1.000		4"	2,000
17	Valves Plug (CZ)	3-1/6"		3,000	3-1/8"		5,000	3-1/8*		10,000

- (II Only one required in Chess 3AL
- (2) Gate valves only shall be used for Class 10M.
- (3) Remote operated hydrausic choice required on 5,000 psi and 10,000 psi for drilling.

#### EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTIONS

- 1. All connections in choke manifold shall be welded, studded, llanged or Cameron clamp of comparable rating.
- 2. All flanges shall be API 68 or 68X and ring gaskets shall be API AX or 8X. Use only 8X for 10 MWP.
- 3. All lines shall be securely anchored.
- 4. Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available.
- 5. 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° bends using bull plugged tees.
- 7. Discharge lines from chokes, choke bypass and from top of gas separator should vent as far as practical from the well,

## **Additional Operator Remarks:**

Devon Energy Production Company, LP proposes to drill a Morrow well to 13,000' 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 attached Drilling and Surface Use Plan.

#### **Directions To Location:**

From the Junction of Co. Rd 248 (Lusk Plant) and Co. Rd 222 (Shugart), go east Co. Rd 248 for 1.1 mile to lease road; thence north on lease road. 0.9 mile winding west to proposed lease road.

#### **Access Road:**

Approximately 125' of access road will be required. Archeological survey's will be requested for the pad and access road.

#### H2S:

No H2S is anticipated to be encountered.

#### **Additional Comments:**

The well is located on Devon lease NMNM-63011, the other federal acreage lease in the spacing unit is NMNM-99039.

## **DRILLING PROGRAM**

# Devon Energy Production Company, LP Roadrunner 11 Federal 1

## Koaurunner II Federal I I & 960' FWI Unit M Sec 11 T105 D21E Ed

Surface Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM Bottom hole Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM

## 1. Geologic Name of Surface Formation

a. Quaternary Eolian and Piedmont Sandstone.

## 2. Estimated tops of geological markers:

Rustler	450'
Salado	625'
Base of Salado	1975'
Yates	2225'
San Andres	4150'
Delaware	4600'
Bone Spring	6875'
3 <sup>rd</sup> Bone Spring SS	9700'
Wolfcamp	10100'
Penn Shale	10450'
Strawn	11100'
Atoka	11500'
Morrow Clastics	12100'
Lower Morrow	12400'
Barnett	12600'
Total Depth	13000'
Total Depth	13
	Salado Base of Salado Yates San Andres Delaware Bone Spring 3 <sup>rd</sup> Bone Spring SS Wolfcamp Penn Shale Strawn Atoka Morrow Clastics Lower Morrow Barnett

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

a.	Rustler	430'	Water
b.	Salado	620'	Barren
c.	Base of Salado	1975'	Barren
d.	Yates	2225'	Oil
e.	San Andres	4150'	Oil
f.	Delaware	4600'	Oil
g.	Bone Spring	6875'	Oil
h.	3 <sup>rd</sup> Bone Spring	9700'	Oil
i.	Wolfcamp	10100'	Gas
j.	Strawn	11100'	Gas
k.	Atoka	11500'	Gas
1.	Morrow Clastics	12100'	Gas
m.	Lower Morrow	12375'	Gas

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 600' and circulating cement

back to surface. Fresh water will be protected by setting 8 5/8" casing at 4600' and circulating cement to surface. The Morrow intervals will be isolated by setting 5 ½" casing to total depth and circulating to surface.

4. Casing Program:	
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, asing 1 1051	v				
<b>Hole Size</b>	Interval 675	OD Csg	Weight	<u>Collar</u>	<u>Grade</u>
17 1/2"	0'-600' 61	13 3/8"	54.5#	ST&C	K-55
12 1/4"	0'- 4600'	8 5/8"	40#	LT&C	L-80
7 7/8"	0' - 12,725'	5 ½"	26#	LT&C	HP-110

555

## 5. Cement Program:

a. 13 3/8" Surface



Cement **Lead Slurry:** 293 sacks (36:65) Poz (Fly Ash): Class C Cement + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 6% bwoc Bentonite. **Tail Slurry:** 250 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake to surface.

b. 8 5/8" Intermediate

Cement Lead Slurry: 1549 sacks (35:65) Poz (Fly Ash): Class C Cement + 3% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 6% bwoc Bentonite + 0.005 gps FP-13L. Tail Slurry: 300 sacks (60:40) Poz (Fly Ash): Class C Cement + 4% bwoc MPA-1 + 5% bwow Sodium Chloride + 0.4% bwoc Sodium Metasilicate to surface.

c. 5 ½" Production

3 Stage Long String Circulated to Surface

#### STAGE 1

Cement Slurry: 664 sacks (15:61:11) Poz (Fly Ash): Class C Cement: CSE-2 + 0.5% bwoc BA-10 + 0.15% bwoc R-3 + 2% bwow Potassium Chloride + 0.75% bwoc EC-1 + 0.25 lbs/sack Cello Flake + 0.7% bwoc CD-32 + 5 bls/sack LCM-1 + 0.6% bwoc FL-25 + 0.6% bwoc FL-52A

#### STAGE 2

Cement Slurry: 876 sacks (60:40) Poz (Fly Ash): Premium Plus H Cement + 1% bwow Sodium Chloride + 0.75% bwoc BA-10 + 0.1% bwoc R-3 + 0.25

lbs/sack Cello Flake + 2 lbs/sack Kol Seal + 4% bwoc MPA-1

## STAGE 3

**Lead Slurry:** 365 sacks (35:65) Poz (Fly Ash): Class C Cement + 3% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 0.005 gps FP-13L + 6% bwoc Bentonite. **Tail Slurry:** 150 sacks (60:40) Poz (Fly Ash): Class C Cement + 5% bwow Sodium Chloride + 0.4% bwoc Soidum Metasilicate + 4% bwoc MAP-1

## 6. Pressure Control Equipment:

The blowout preventor equipment (BOP) shown in Exhibit #1 will consist of a (3M system) double ram type (5000 psi WP) preventor and a bag-type (Hydril) preventor (5000 psi WP). Both units will be hydraulically operated and the ram type preventor will be equipped with blind rams on top and 4 ½" drill pipe rams on bottom. The drilling head 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 with the rig pump 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 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 5000 psi WP rating.

## 7. Proposed Mud Circulation System

	Depth 176	Mud Wt.	<u>Visc</u>	Fluid Loss	Type System
	Depth 0' - 1500'	8.5-9.5	35-45	NC	Fresh Water
175'	6 <del>00</del> 7 – 4,500°	10	28-32	NC	Brine Water
40	4500' – 10,000'	8.8 - 9.2	28-30	NC	Cut Brine
	10,000'-12,725'	9.2 - 10.2	36-48	8-10cc's	Brine Water

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

## 8. 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 will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

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

- a. Drill stem tests will be based on geological sample shows.
- b. The open hole electrical logging program will be:
  - i. Total Depth to Intermediate Casing Dual Laterolog-Micro Laterolog with SP and Gamma Ray. Compensated Neutron Z Density log with Gamma Ray and Caliper.
  - ii. Total Depth to Surface Compensated Neutron with Gamma Ray
  - iii. No coring program is planned
  - iv. Additional testing will be initiated subsequent to setting the 5 ½" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

#### 10. Potential Hazards:

a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6 No lost circulation is expected to occur. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Estimated BHP 5000 psi and Estimated BHT 180°. No H2S is expected to be encountered.

## 11. Anticipated Starting Date and Duration of Operations:

a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 32 days. If production casing is run then an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.

#### SURFACE USE PLAN

## Devon Energy Production Company, LP

## Roadrunner 11 Federal 1

Surface Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM Bottom hole Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM

## 1. Existing Roads:

- a. The well site and elevation plat for the proposed well are reflected on Exhibit 2. The well was staked by Basin Surveys.
- b. All roads into the location are depicted on Exhibit 3.
- c. Directions to Location: From the Junction of Co. Rd 248 (Lusk Plant) and Co. Rd 222 (Shugart), go east Co. Rd 248 for 1.1 mile to lease road; thence north on lease road. 0.9 mile winding west to proposed lease road.

#### 2. Access Road

- a. Exhibit #3 shows the existing lease road. Approximately 125' of new access road will be constructed as follows:
- b. The maximum width of the road will be 15'. 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. The average grade will be approximately 1%.
- d. No cattle guards, grates or fence cuts will be required. No turnouts are planned.

#### 3. Proposed Facilities

- a. In the event the well is found productive, the Roadrunner 11 Com 1 tank battery would be utilized and the necessary production equipment will be installed at the well site.
- b. 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.
- c. All flow lines will adhere to API standards.
- 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 state.

## 4. 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.

## 5. 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.

#### 6. 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 US Government and 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.

Wyatt Abbitt	Don Mayberry
Operations Engineer Advisor	Superintendent
Devon Energy Production Company, L.P.	Devon Energy Production Company, L.P.
20 North Broadway, Suite 1500	Post Office Box 250
Oklahoma City, OK 73102-8260	Artesia, NM 88211-0250
(405) 552-8137 (office)	(505) 748-3371 (office)
(405) 245-3471 (Cellular)	(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: // / · Stephanie A Vegegge

Staff Engineering Technician

Date:

June 12<sup>th</sup>, 2006

# Attachment to Exhibit #1 NOTES REGARDING BLOWOUT PREVENTERS

Devon Energy Production Company, LP

#### Roadrunner 11 Federal 1

Surface Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM Bottom hole Location: 660' FSL & 860' FWL, Unit M, Sec 11 T19S R31E, Eddy, NM

- 1. Drilling nipple will be constructed so it can be removed mechanically without the aid of a welder. The minimum internal diameter will equal BOP bore.
- 2. Wear ring will be properly installed in head.
- 3. Blowout preventer and all associated fittings will be in operable condition to withstand a minimum 5000 psi working pressure.
- 4. All fittings will be flanged.
- 5. A full bore safety valve tested to a minimum 5000 psi WP with proper thread connections will be available on the rotary rig floor at all times.
- 6. All choke lines will be anchored to prevent movement.
- 7. All BOP equipment will be equal to or larger in bore than the internal diameter of the last casing string.
- 8. Will maintain a kelly cock attached to the kelly.
- 9. Hand wheels and wrenches will be properly installed and tested for safe operation.
- 10. Hydraulic floor control for blowout preventer will be located as near in proximity to driller's controls as possible.
- 11. All BOP equipment will meet API standards and include a minimum 40 gallon accumulator having two independent means of power to initiate closing operation.

## **HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

- 1. All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:
  - a. Characteristics of H2S
  - b. Physical effects and hazards
  - c. Proper use of safety equipment and life support systems.
  - d. Principle and operation of H2S detectors, warning system and briefing areas
  - e. Evacuation procedures, routes and first aid.
  - f. Proper use of 30-minute pressure demand air pack.
- 2. H2S Detection and Alarm System
  - a. H2S detectors and audio alarm system to be located at bell nipple, end of blooie line (mud pit) and on derrick floor or doghouse.
- 3. Windsock and/or wind streamers
  - a. Windsock at mud pit area should be high enough to be visible
  - b. Windsock at briefing area should be high enough to be visible
  - c. There should be a windsock at entrance to location
- 4. Condition Flags and Signs
  - a. Warning Sign on access road to location
  - b. Flags to be displayed on sign at entrance to location. Green flag, normal safe condition. Yellow flag indicates potential pressure and danger. Red flag, danger, H2S present in dangerous concentration. Only emergency personnel admitted to location.
- 5. Well Control Equipment
  - a. See Exhibit "E" & "E-1"
- 6. Communication
  - a. While working under masks chalkboards will be used for communication.
  - b. Hand signals will be used where chalk board is inappropriate
  - c. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.
- 7. Drill stem Testing
  - a. Exhausts will be watered
  - b. Flare line will be equipped with an electric igniter or a propane pilot light in case gas reaches the surface.
  - c. If the location is near to a dwelling a closed DST will be performed.
- 8. Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubular goods and other mechanical equipment.

If H2S is encountered, mud system will be altered if necessary to maintain control or formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.