

Year  
MAR 23 2007  
ARTESIA, NM

Form 3160-3  
(February 2005)

OCD-ARTESIA

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

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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-15303
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 Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator Southwestern Energy Production Company		7. If Unit or CA Agreement, Name and No.
3a. Address 2350 N. Sam Houston Parkway East, Suite 125 Houston, Texas 77032		8. Lease Name and Well No. Corral Fly Federal 2-H 34425
3b. Phone No. (include area code) (281) 618-4887		9. API Well No. 30-015-35500
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 2,520' FNL & 660' FEL of Sect. 10, T25S R29E Eddy County New Mexico At proposed prod. zone 2,043' FNL & 660' FEL of Sect. 10, T25S R29E Eddy County New Mexico		10. Field and Pool, or Exploratory Corral Canyon, Delaware, NW
14. Distance in miles and direction from nearest town or post office* CARLSBAD CONTROLLED WATER BASIN		11. Sec., T. R. M. or Blk. and Survey or Area Sec 10, T25S - R29E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No. of acres in lease 160	12. County or Parish Eddy
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth 7,415' MD / 5,300' TVD	13. State NM
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3,059' GL	22. Approximate date work will start* 04/01/2007	17. Spacing Unit dedicated to this well 80
20. BLM/BIA Bond No. on file ES-0051		23. Estimated duration 24 days

24. Attachments

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

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification   |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

25. Signature Martha C. Howard	Name (Printed/Typed) Martha Howard	Date 03/01/2007
Title Staff Regulatory Analyst		

Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed) CARLSBAD FIELD OFFICE	Date MAR 21 2007
Title ACTING FIELD MANAGER		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*(Instructions on page 2)

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL  
APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS AND  
SPECIAL STIPULATIONS  
ATTACHED

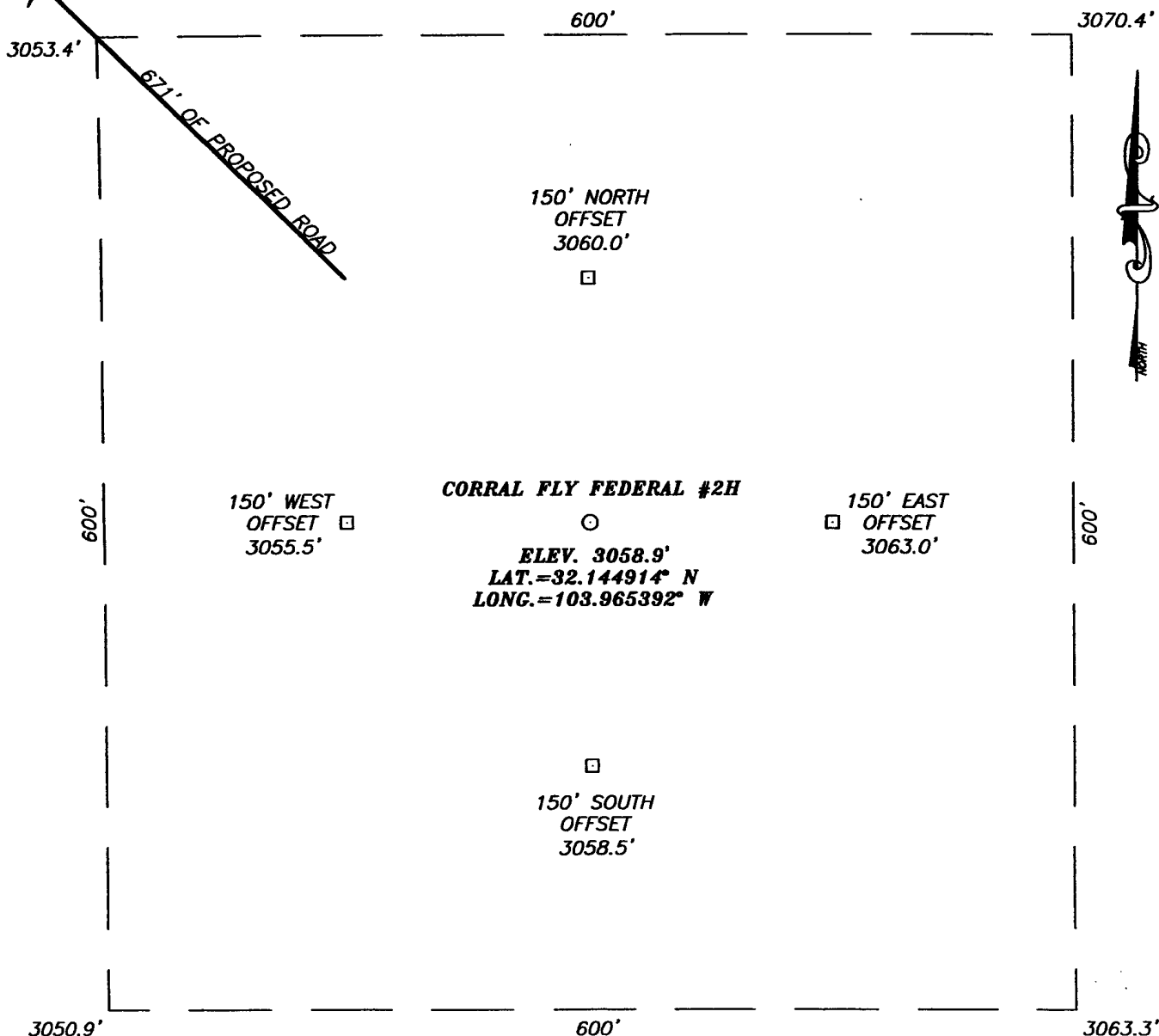
NS L-5589



# SECTION 10, TOWNSHIP 25 SOUTH, RANGE 29 EAST, N.M.P.M.,

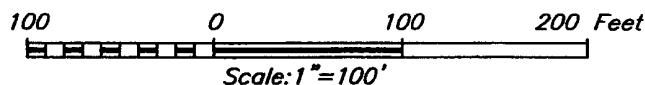
EDDY COUNTY,

NEW MEXICO



## DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. #725 (WHITEHORN RD.), GO NORTHEAST ON CO. RD. #725 APPROX. 5.5 MILES. TURN LEFT AND GO NORTH APPROX. 4.2 MILES. VEER RIGHT AND GO NORTHEAST APPROX. 1.0 MILE TO A PROPOSED ROAD SURVEY. FOLLOW PROPOSED ROAD SURVEY SOUTHEAST APPROX. 883 FEET TO THIS LOCATION.



PROVIDING SURVEYING SERVICES  
SINCE 1946

**JOHN WEST SURVEYING COMPANY**

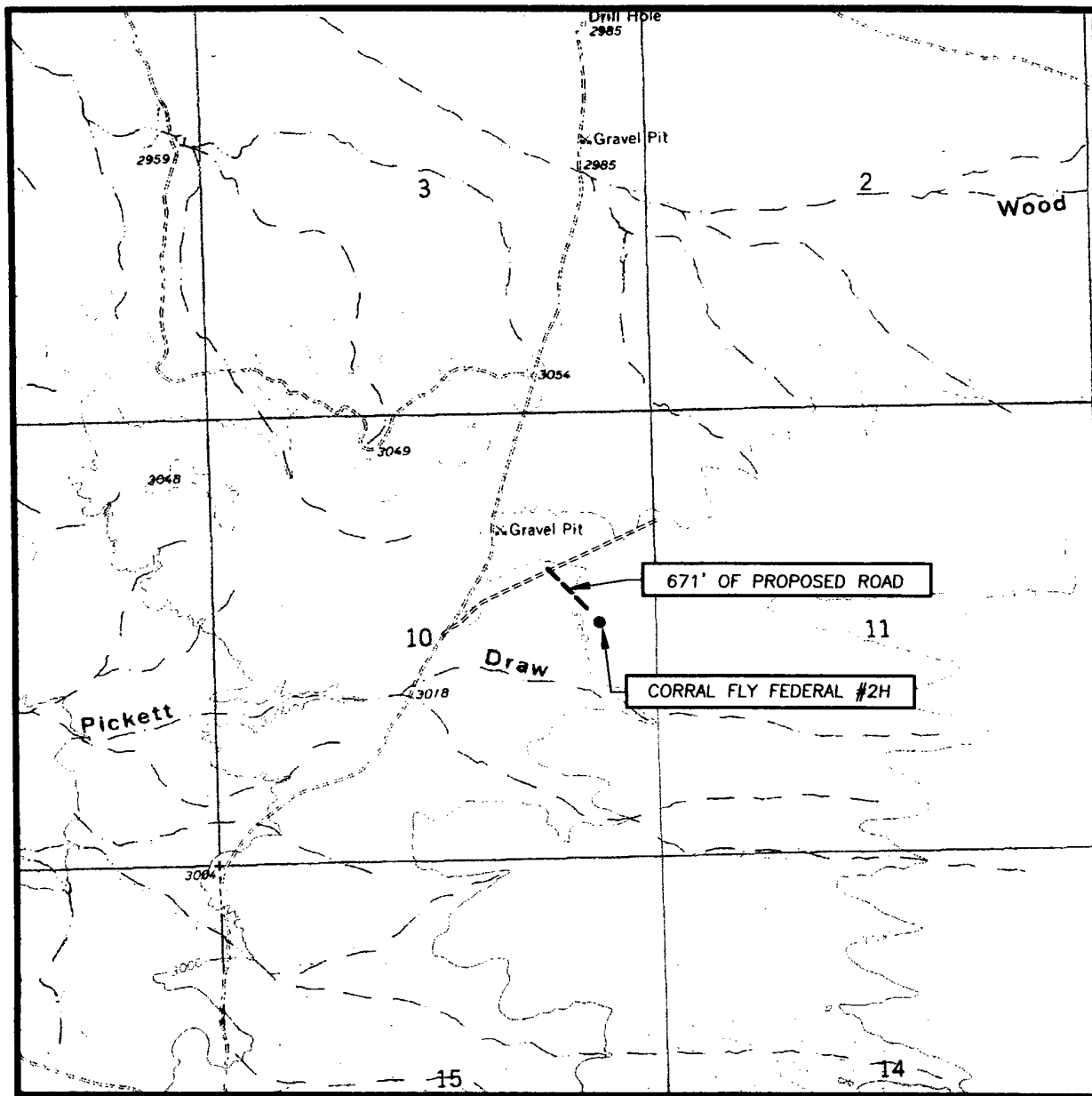
412 N. DAL PASO  
HOBBBS, N.M. 88240  
(505) 383-3117

## SOUTHWESTERN ENERGY PRODUCTION COMPANY

CORRAL FLY FEDERAL #2H  
LOCATED 2520 FEET FROM THE NORTH LINE  
AND 660 FEET FROM THE EAST LINE OF SECTION 10,  
TOWNSHIP 25 SOUTH, RANGE 29 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.

Survey Date: 12/19/06	Sheet 1 of 1 Sheets
W.O. Number: 06.11.2000	Dr By: J.R.
Date: 12/28/06	Disk: CD#6
06112000	Scale: 1"=100'

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
PIERCE CANYON, N.M. - 10'

SEC. 10 TWP. 25-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

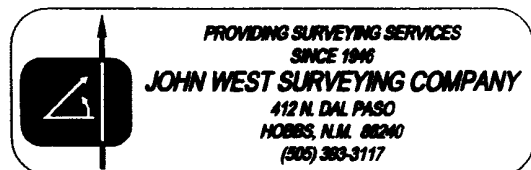
DESCRIPTION 2520' FNL & 660' FEL

ELEVATION 3059'

OPERATOR SOUTHWESTERN ENERGY  
PRODUCTION COMPANY

LEASE CORRAL FLY FEDERAL

U.S.G.S. TOPOGRAPHIC MAP  
PIERCE CANYON, N.M.



**Southwestern Energy Production Company**  
**Drilling and Operations Program**

**Corral Fly Federal #2H**  
**2,520' FNL & 660' FEL, Unit H**  
**Section 10, T25S, R29E**  
**Eddy County New Mexico**

In conjunction with Form 3160-3, Application for Permit to Drill subject well, Southwestern Energy Production Company submits the following ten (10) items of pertinent information in accordance with BLM requirements.

1. **The geological surface formation is Permian.**
2. **The estimated tops of geological markers are as follows**

<b>Formation</b>	<b>Depth (ft)</b>
Rustler	573'
Top Salt	1,645'
Bottom Salt	2,924'
Top of Delaware	3,173'

3. **The estimated depth at which water, oil or gas formations are expected to be encountered:**

Delaware                      3,173'                      Oil

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 9-5/8" casing at 750' MD 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 inserting a float shoe joint into the 5-1/2" production casing which will be run at TD to sufficiently cover all known oil and gas horizons 200' above.

**Corral Fly Federal #2H  
Drilling Plan**

**4. Proposed Well and Casing Program:**

The well plan consists of drilling a vertical pilot hole to 5,600' MD and run wireline logs to confirm the depth of the Cherry Canyon 4 target zone. The well will be plugged back and prepared to the estimated KOP (kick off point) at 4,823' MD/TVD. The hole will be directional drilled utilizing a build rate of 12°/100' to penetrate the Cherry Canyon 4 Sand at 5,573' MD / 5,300' TVD at 90° of angle. The Cherry Canyon 4 will be intersected at 2,043' FNL and 660' FEL of Section 10 T25S R29E. The well will continue laterally (90°) for ±2320' of vertical displacement. The proposed BHL will be 200' FNL & 660' FEL of section 10. The top of the Delaware will be intersected at 3145' MD/TVD at 2,520' FNL and 660' FEL of Section 10. A drilling prognosis, directional plot, and proposed survey report are attached as Exhibit #1 & #2.

	<u>Hole Size</u>	<u>Interval</u>	<u>Casing OD</u>	<u>Wt.</u>	<u>Grade</u>
See COA	12-1/4"	0-750'	9-5/8"	36#	J-55
	8-3/4"	0- 7,415'	5-1/2"	17#	N-80

**Proposed Cementing Program:**

**9-5/8" Surface Casing:**

Based on 100% excess and circulating to surface

Lead: 150 sxs of 35:65 Poz:Class "C" @ 12.7 ppg (Yield 1.88 ft<sup>3</sup>/sx)

Tail: 150 sxs of Class "C" @ 14.8 ppg (Yield 1.34 ft<sup>3</sup>/sx)

**5-1/2" Production Casing:**

Stage 1: 360 sxs of TXI Lightweight + 100% D151 + 0.2% D174 + 0.2% D46 + 0.5% D65 + 2% S1 mixed at 13.0 ppg (Yield = 2.76ft<sup>3</sup>/sx)  
Top of cement for Stage 1 to be at 4,800' MD and based on 50% excess

DV Tool at 4800' MD

**Stage 2:**

Lead: 850 sxs of 35:65 Poz:Class C + 6%D20 + 0.2% D167 + 0.2% D65 + 0.2% D46 mixed at 12.5 ppg (Yield = 2.0 ft<sup>3</sup>/sx)

Tail: 100 sxs Class "C" Neat @ 14.8 ppg (Yield = 1.32 ft<sup>3</sup>/sx)

Top of cement for Stage 2 to be at surface and based on 50% excess in open hole

**Corral Fly Federal #2H  
Drilling Plan**

**5. Pressure Control Equipment**

The blowout preventor equipment (BOP) shown in Exhibit #3 will consist of a 2000 psig WP double ram type preventor and annular preventer. Both units will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4-½" pipe rams on bottom. Both BOP's will be installed on the 9-5/8" surface casing and utilized continuously until total depth is reached. All BOP's and associated equipment will be tested to 1000 psig with the rig pump prior to drilling out the 9-5/8" casing shoe.

Pipe rams will be operated and checked each 24-hour period and each time the drill pipe is out of the hole. These function 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 manifold having a 5000 psig WP rating.

Actual BOP and manifold drawing will be submitted after rig selection.

**6. Mud Program:**

The applicable depth and properties of this system are as follows:

Depth	Type	MW (ppg)	Viscosity (sec)	Fluid Loss (cc)
0-750'	Fresh Water	8.5	28-30	Not Controlled
750' - 7,415'	Brine	9.8 - 10.2	38-45	10-12 cc in Lateral

**7. Auxiliary Equipment:**

- A Kelly Cock will be in the drill string at all times
- A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times

**8. Testing, Logging, and Core Program:**

- No drillstem tests are anticipated
- The electric logging program will consist of:
  - i. Total Depth of Pilot Hole to Base of Surface Casing:  
Dual Laterolog-Micro Laterolog with SP and Gamma Ray  
Compensated Neutron -Z Density log with Gamma Ray and Caliper
  - ii. Total Depth of Horizontal Drainhole to Kick off Point:  
Gamma Ray Depth Control log

**Corral Fly Federal #2H  
Drilling Plan**

**9. Potential Hazards**

No abnormal pressures or temperatures are expected.

The estimated BHP of the Cherry Canyon 4 Sand is 1500 psig with an BHT of 130°F.

There is no known presence of H<sub>2</sub>S in this area.

**10. Anticipated Starting Date and Duration of Operations**

Road and location construction will begin after the BLM has approved the APD.

The 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 24 days. If production casing is run, 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.



**Southwestern Energy Production Company**  
**Surface Use and Operating Plan**

**Corral Fly Federal #2H**  
**2,520' FNL & 660' FEL, Unit H**  
**Section 10, T25S, R29E**  
**Eddy County New Mexico**

This plan is submitted with Form 3160-3, Application for Permit to Drill, covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved and the procedures to be followed in rehabilitating the surface after completion of the operations, so that a complete appraisal can be made of the environmental effect associated with the operations.

**1. Existing Roads**

- a. The well site and elevation plat for the proposed well are reflected in the attached survey. This well was surveyed by John West Surveying Company in Hobbs, New Mexico.
- b. All roads into the location are depicted in Exhibit #4.
- c. All existing roads will be maintained in the same or better condition.
- d. Directions to location:  
From Malaga, New Mexico go north on Hwy 285 to SR 31 and turn right (East). Follow SR 31 to SR 128. Turn right onto SR 128 and continue on SR 128 (East of mile marker 19), turn South on Buck Jackson Road (CR 786) for 9.2 miles. Turn West (right) on CR 787 for 0.1 miles. Turn Southwest (left) on El Paso Pipeline ROW for 4.6 miles. Turn West (right) @ Devon Energy (Southwestern Energy) Sign. Go Northwest 0.5 miles to a "Y" in the road. Take right at "Y" and follow main road approximately 6.2 miles

**2. Access Road**

- a. Exhibit #4 shows the existing lease road. Approximately 671' of new access road will be required. It will be constructed as follows:
  - i. 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.
  - ii. Surface material will be native caliche. This material will be obtained from a BLM approved pit nearest to the location.
  - iii. No cattle guards, grates, or fence cuts will be required. No turnouts are planned.

**3. Location of Existing Wells**

- a. Exhibit # 4 is a plat that shows all wells within a 1-mile radius of the proposed surface location.

## **Corral Fly Federal #2H**

### **Surface Use and Operating Plan**

#### **4. 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 the well is productive, rehabilitation plans are as follows:
  - i. The reserve pit will be closed pursuant to OCD rules and guidelines.
  - 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.

#### **5. Methods of Handling Water Disposal**

- a. Drill cuttings will be disposed into the reserve pit.
- 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. Remaining drilling fluids will be allowed to evaporate in the reserve pit until the pits are dry enough to be closed. If the drilling fluids do not evaporate in a reasonable time they will be hauled off by transports to a state approved disposal site. The reserve pit will be closed pursuant to NM OCD rules and guidelines.
- d. Water produced during completion will be put into the reserve pit. Oil and condensate produced will be put in a storage tank and sold.

#### **6. Well Site Layout**

- a. Exhibit #5 shows the proposed well site layout dimensions of the well pad and reserve pit.
- b. Mud pits in the active circulating system will be steel pits & the reserve pit will be lined with a 12 mil synthetic liner.
- c. The reserve pit will be fenced on three sides during drilling and completion operations. After the rig is removed, the reserve pit will be fenced on the fourth side to preclude endangering wildlife. The fencing shall remain in place until the pit is reclaimed. If the well is a producer, 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, sagebrush, yucca, and miscellaneous weeds.
- b. The surface and minerals are owned by the U.S. 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. An archaeological survey has been performed and was forwarded to the Bureau of Land Management.
- d. There are no dwellings within 2 miles of location.

**Corral Fly Federal #2H  
Surface Use and Operating Plan**

**Operators Representative:**

**Through APD Approval:**

Martha Howard  
Regulatory Analyst  
Southwestern Energy Production Company  
2350 N. Sam Houston Parkway East  
Houston, Texas 77032  
Phone: (281) 618- 4887

**Through Drilling Operations:**

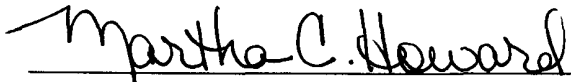
Alan Grimsley  
Drilling Engineer  
Southwestern Energy Production Company  
2350 N. Sam Houston Parkway East  
Houston, Texas 77032  
Phone: (281) 618- 4068  
Cell: (713) 492-1657

**Through Completion and Production Operations:**

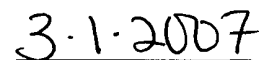
Bruce Drummond  
Production Superintendent  
Southwestern Energy Production Company  
816 E. Green Acres  
Hobbs, New Mexico, 88240  
Phone: (505) 393- 1850  
Cell: (505) 631-8083

**Certification:**

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route, that I am familiar with the conditions which 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 therein will be performed by Southwestern energy Production Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.



Martha Howard  
Staff Regulatory Analyst



Date



**Southwestern Energy  
Company**

**Southwestern Energy Production Company  
2350 N. Sam Houston Parkway East  
Suite 125  
Houston, Texas 77032**

# **Hydrogen Sulfide (H<sub>2</sub>S) Contingency Plan**

**For**

**Corral Fly Federal #1-H**

**And**

**Corral Fly Federal #2-H**

These wells are open drilling sites. H<sub>2</sub>S monitoring equipment and emergency response equipment will be used within 500' of the zones known to contain H<sub>2</sub>S, including warning signs, wind indicators and H<sub>2</sub>S monitor.

Assumed 100 ppm ROE = 3000' (Radius of Exposure)  
100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

### **Emergency Procedures**

In the case of a release of gas containing H<sub>2</sub>S, the first responder(s) must isolate the area and prevent entry by other persons into the 100 ppm ROE. Additionally the first responder(s) must evacuate any public places encompassed by the 100 ppm ROE. First responder(s) must take care not to injure themselves during this operation. Company and/or local officials must be contacted to aid in this operation. Evacuation of the public should be beyond the 100 ppm ROE.

All responders must have training in the detection of H<sub>2</sub>S, measures for protection against the gas, equipment used for protection and emergency response. Additionally, responders must be equipped with H<sub>2</sub>S monitors and air packs in order to control the release. Use the "buddy system" to ensure no injuries during the response.

### **Ignition of Gas Source**

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO<sub>2</sub>). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

### **Characteristics of H<sub>2</sub>S and SO<sub>2</sub>**

<b>Common Name</b>	<b>Chemical Formula</b>	<b>Specific Gravity</b>	<b>Threshold Limit</b>	<b>Hazardous Limit</b>	<b>Lethal Concentration</b>
<b>Hydrogen Sulfide</b>	H <sub>2</sub> S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
<b>Sulfur Dioxide</b>	SO <sub>2</sub>	2.21 Air = 1	2 ppm	N/A	1000 ppm

## **Contacting Authorities**

Southwestern Energy Production Company personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the NMOCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Southwestern Energy Production Company response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

### **Southwestern Energy Production Call List**      **Office**      **Cellular**

Bruce Drummond – Production Foreman.....	505-393-1850 .....	505-631-8083
Jeff Kallmeyer – Production Engineer.....	281-618-7442 .....	832-260-1890
Alan Grimsley – Drilling Engineer.. ..	281-618-4068 .....	713-492-1657
Reese Mitchell – Drilling Manager.. ..	281-618-4071 .....	281-702-6703
David Pickard – HSE Manager.....	281-618-4054 .....	713-516-6296

## **Agency Call List**

### **Eddy County (505)**

#### **Artesia**

State Police.....	746-2703
City Police.....	746-2703
Sheriff's Office .....	746-9888
Ambulance .....	911
Fire Department .....	746-2701
LEPC (Local Emergency Planning Committee) .....	746-2122
NMOCD.....	748-1283

#### **Carlsbad**

State Police.....	885-3137
City Police.....	885-2111
Sheriff's Office .....	887-7551
Ambulance .....	911
Fire Department .....	885-2111
LEPC (Local Emergency Planning Committee).....	887-3798
US Bureau of Land Management .....	887-6544

New Mexico Emergency Response Commission (Santa Fe)	(505)476-9600
24 HR .....	(505) 827-9126
National Emergency Response Center (Washington, DC)	... (800) 424-8802

## Other

Wild Well Control	(281) 353-5481
Boots & Coots IWC	1-800-256-9688 or (281) 931-8884
Cudd Pressure Control	(915) 699-0139 or (915) 563-3356
Halliburton .....	(432) 682-4305
B. J. Services.....	(505) 392-5556
B.J. Services	(505) 746-3140
Schlumberger	(505) 748-1391
Flight For Life -4000 24th St, Lubbock, TX .....	(806) 743-9911
Aerocare -Rr 3 Box 49f, Lubbock, TX .....	(806) 747-8923
Med Flight Air Amb 2301 Yale Blvd SE #D3, Albuq, NM .....	(505) 842-4433
S B Air Med Svc 2505 Clark Carr Loop SE, Albuq, NM ....	(505) 842-4949



**WELL NAME:** Corral Fly Federal #2-H

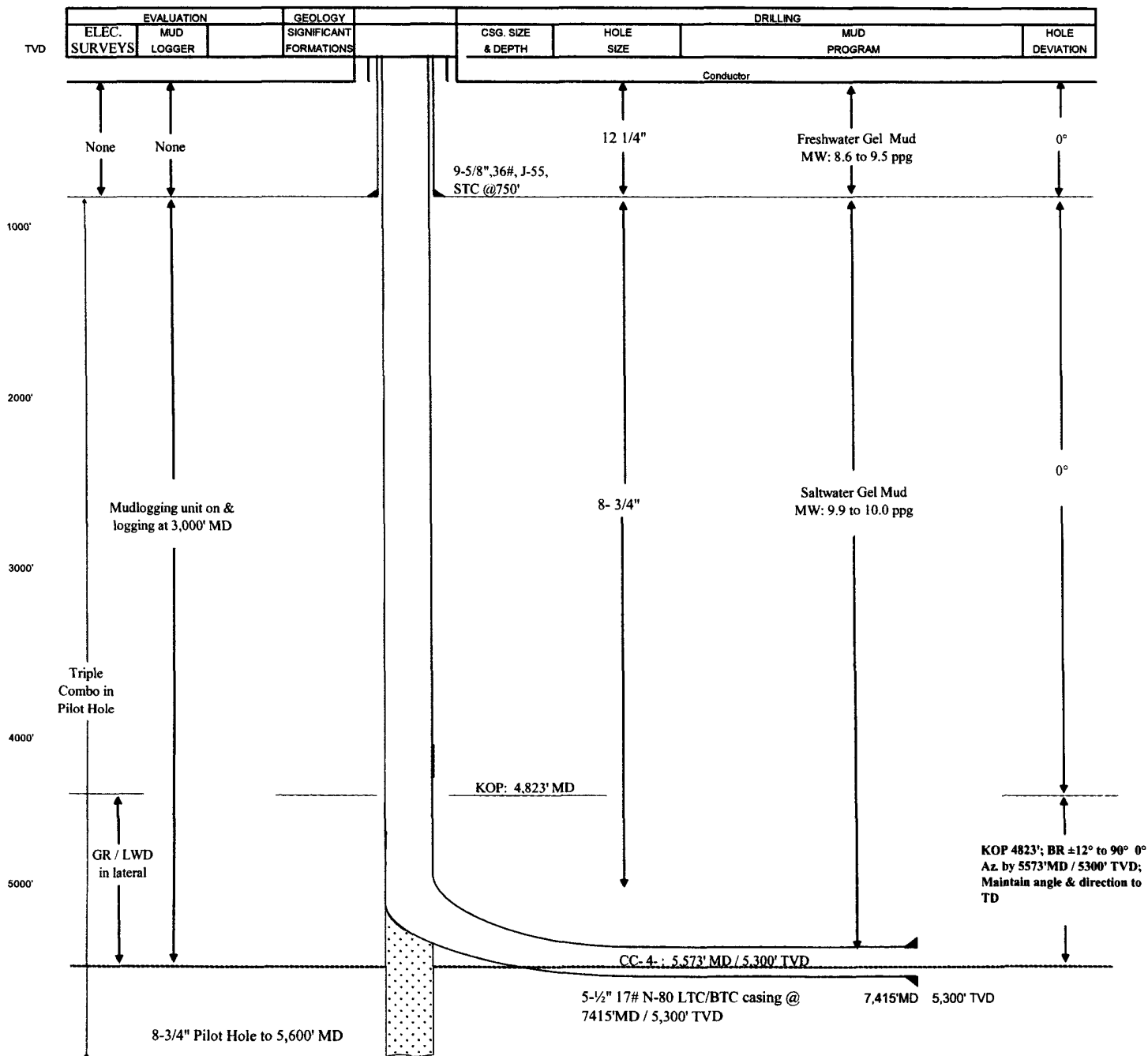
**A/E NO.**

**LOCATION:** Sec. 10, T25S, R29E  
Eddy County NM  
SL: 2520' FSL 660' FEL  
BHL: 200' FNL 660' FEL  
TGT ENTRY PT: 2,043' FNL 660' FEL

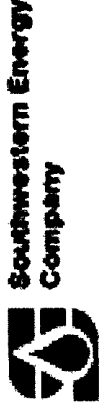
**PROSPECT:** Corral Fly

**OBJECTIVE:** Cherry Canyon Sd, CC-4

**EST. ELEVATION: GL 3059'; RKB  $\pm$ 16"**





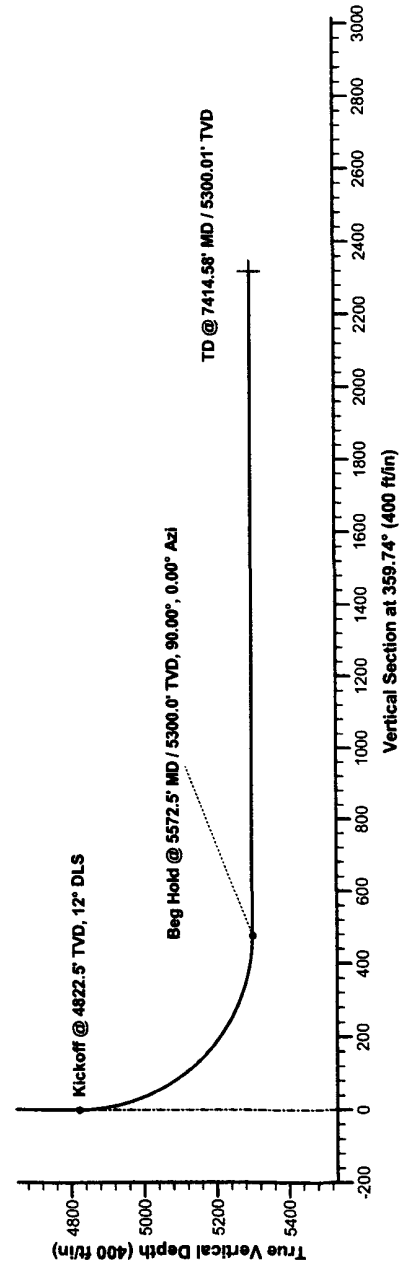


Southwestern Energy Production Co.  
Corral Fly Federal #2H  
Corral Fly Section 10 - T25S R29E  
Eddy County New Mexico  
Plan #1 - Rev 1



Surface Location		Ground Elevation: 6300.00 ESTIMATED RKB @ 6325.01 ft (RIG NOT SPECIFIED)				Exhibit #2	
+N/-S	+E/-W	North	East	Latitude	Longitude	Slot	
0.00	-0.05	416636.00	613880.50	32° 8' 41.683" N	103° 57' 55.425" W		

TARGET LOCATIONS					
Name	TVD	+N/-S	+E/-W	North	East
BHL	5300.01	2319.50	-6.65	418955.50	613873.90



SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
1	0.00	0.00	359.84	0.00	0.00	-0.05	0.00	0.00	0.00
2	4822.54	0.00	359.84	4822.54	0.00	-0.05	0.00	0.00	0.00
3	5572.55	90.00	359.84	5300.01	477.46	-1.41	12.00	359.84	477.47
4	7414.59	90.00	359.84	5300.01	2319.50	-6.65	0.00	0.00	2319.51

BHL (Corral Fly Federal #2H)

# **Southwestern Energy Production Co.**

**Eddy County New Mexico  
Corral Fly Section 10 - T25S R29E  
Corral Fly Federal #2H  
Wellbore #1**

**Plan: Plan #1 - Rev 1**

## **Standard Planning Report**

**16 February, 2007**

# Crescent Directional Drilling Planning Report

COMPASS 2003.11_CDDSVR	Local Coordinates Reference:	Well Corral Fly Federal #2H
Southwestern Energy Production Co.	TVD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Eddy County New Mexico	MD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Corral Fly Section 10 - T25S R29E	North Reference:	Grid
Corral Fly Federal #2H	Survey Calculation Method:	Minimum Curvature
Wellbore #1		
Plan #1 - Rev 1		

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

Site:	Corral Fly Section 10 - T25S R29E		
Site Position:		Northing:	608,723.22 ft
From:	Map	Easting:	460,993.92 ft
Position Uncertainty:	0.00 ft	Slot Radius:	in
		Latitude:	32° 40' 24.286" N
		Longitude:	104° 27' 36.359" W
		Grid Convergence:	-0.07 °

Well:	Corral Fly Federal #2H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	-0.05 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	32° 08' 41.683" N
		Longitude:	103° 57' 55.425" W
		Ground Level:	6,300.00 ft

Wellbore:	Wellbore #1		
Magnetic:	Model Name	Sample Date	Declination
	IGRF2005-10	12/17/2006	(°)
			8.28
			Dip Angle
			(°)
			60.16
			Field Strength
			(mT)
			48,968

Design:	Plan #1 - Rev 1		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	-0.05
			Direction
			(°)
			359.74

Plan Section										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (1/100ft)	Bend Rate (1/100ft)	Turn Rate (1/100ft)	TFO (°)	Target
0.00	0.00	359.84	0.00	0.00	-0.05	0.00	0.00	0.00	0.00	
4,822.54	0.00	359.84	4,822.54	0.00	-0.05	0.00	0.00	0.00	0.00	
5,572.55	90.00	359.84	5,300.01	477.46	-1.41	12.00	12.00	0.00	359.84	
7,414.59	90.00	359.84	5,300.01	2,319.50	-6.65	0.00	0.00	0.00	0.00	BHL (Corral Fly Federal #2H)

# Crescent Directional Drilling Planning Report

Database:	COMPASS_2003.11_CDDSVR	Local Co-ordinate Reference:	Well Corral Fly Federal #2H
Company:	Southwestern Energy Production Co.	TVD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Project:	Eddy County New Mexico	MD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Well:	Corral Fly Section 10 - T25S R29E	North Reference:	Grid
Wellbore:	Corral Fly Federal #2H	Borehole Calculation Method:	Minimum Curvature
Design:	Wellbore #1		
	Plan #1 - Rev 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Drop (ft/100ft)	Build (ft/100ft)	Turn Rate (°/100ft)
0.00	0.00	359.84	0.00	0.00	-0.05	0.00	0.00	0.00	0.00
100.00	0.00	359.84	100.00	0.00	-0.05	0.00	0.00	0.00	0.00
200.00	0.00	359.84	200.00	0.00	-0.05	0.00	0.00	0.00	0.00
300.00	0.00	359.84	300.00	0.00	-0.05	0.00	0.00	0.00	0.00
400.00	0.00	359.84	400.00	0.00	-0.05	0.00	0.00	0.00	0.00
500.00	0.00	359.84	500.00	0.00	-0.05	0.00	0.00	0.00	0.00
600.00	0.00	359.84	600.00	0.00	-0.05	0.00	0.00	0.00	0.00
700.00	0.00	359.84	700.00	0.00	-0.05	0.00	0.00	0.00	0.00
800.00	0.00	359.84	800.00	0.00	-0.05	0.00	0.00	0.00	0.00
900.00	0.00	359.84	900.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,000.00	0.00	359.84	1,000.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,100.00	0.00	359.84	1,100.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,200.00	0.00	359.84	1,200.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,300.00	0.00	359.84	1,300.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,400.00	0.00	359.84	1,400.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,500.00	0.00	359.84	1,500.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,600.00	0.00	359.84	1,600.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,700.00	0.00	359.84	1,700.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,800.00	0.00	359.84	1,800.00	0.00	-0.05	0.00	0.00	0.00	0.00
1,900.00	0.00	359.84	1,900.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,000.00	0.00	359.84	2,000.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,100.00	0.00	359.84	2,100.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,200.00	0.00	359.84	2,200.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,300.00	0.00	359.84	2,300.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,400.00	0.00	359.84	2,400.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,500.00	0.00	359.84	2,500.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,600.00	0.00	359.84	2,600.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,700.00	0.00	359.84	2,700.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,800.00	0.00	359.84	2,800.00	0.00	-0.05	0.00	0.00	0.00	0.00
2,900.00	0.00	359.84	2,900.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,000.00	0.00	359.84	3,000.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,100.00	0.00	359.84	3,100.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,200.00	0.00	359.84	3,200.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,300.00	0.00	359.84	3,300.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,400.00	0.00	359.84	3,400.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,500.00	0.00	359.84	3,500.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,600.00	0.00	359.84	3,600.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,700.00	0.00	359.84	3,700.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,800.00	0.00	359.84	3,800.00	0.00	-0.05	0.00	0.00	0.00	0.00
3,900.00	0.00	359.84	3,900.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,000.00	0.00	359.84	4,000.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,100.00	0.00	359.84	4,100.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,200.00	0.00	359.84	4,200.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,300.00	0.00	359.84	4,300.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,400.00	0.00	359.84	4,400.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,500.00	0.00	359.84	4,500.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,600.00	0.00	359.84	4,600.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,700.00	0.00	359.84	4,700.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,800.00	0.00	359.84	4,800.00	0.00	-0.05	0.00	0.00	0.00	0.00
4,822.54	0.00	359.84	4,822.54	0.00	-0.05	0.00	0.00	0.00	0.00
Kickoff @ 4822.5' TVD, 12° DLS									
4,900.00	9.29	359.84	4,899.66	6.27	-0.07	6.27	12.00	12.00	0.00

# Crescent Directional Drilling Planning Report

Database:	COMPASS_2003.11_CDDSVR	Local Co-ordinates Reference:	Well Corral Fly Federal #2H
Company:	Southwestern Energy Production Co.	TVD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Project:	Eddy County New Mexico	MD Reference:	ESTIMATED RKB @ 6325.01ft (RIG NOT SPECIFIED)
Site:	Corral Fly Section 10 - T25S R29E	North Reference:	Grid
Well:	Corral Fly Federal #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 - Rev 1		

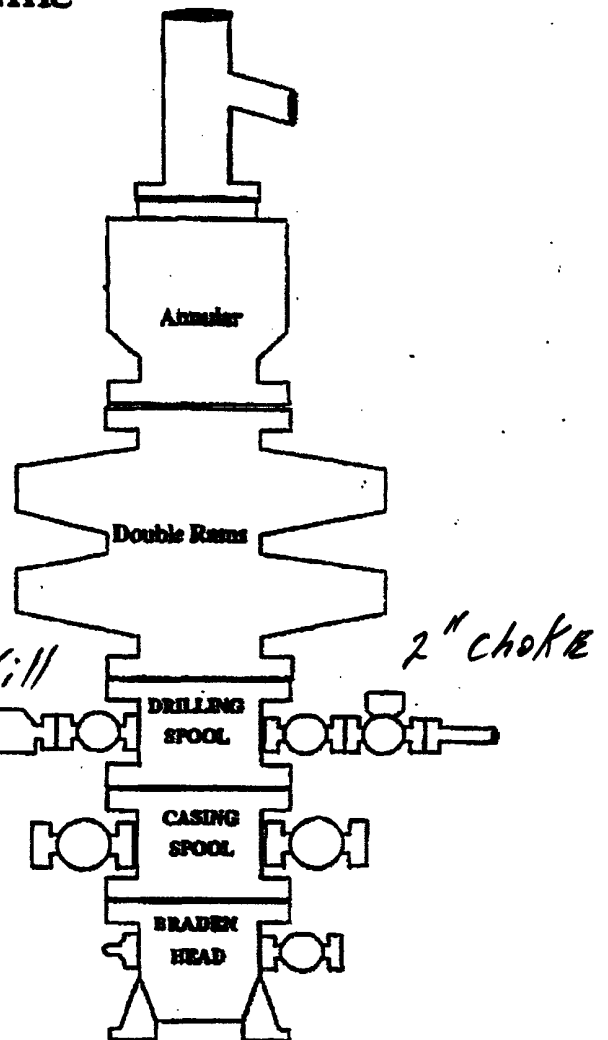
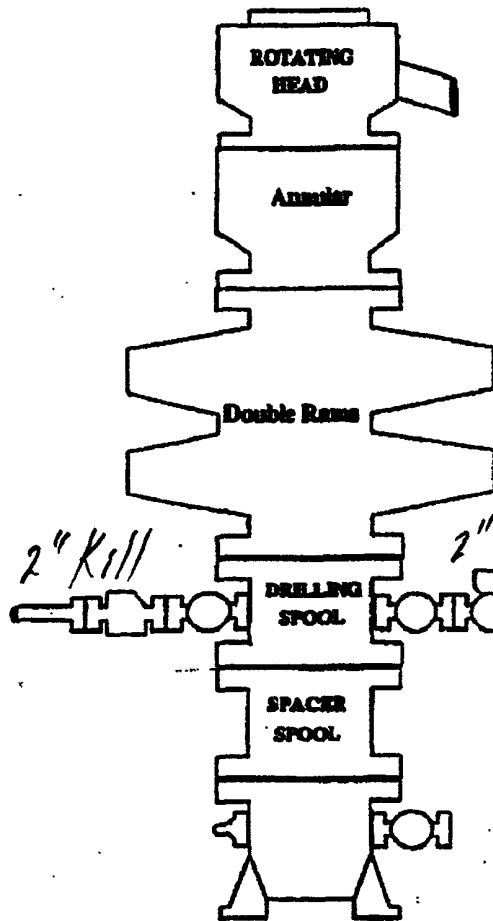
5,000.00	21.29	359.84	4,995.94	32.60	-0.14	32.60	12.00	12.00	0.00
5,100.00	33.29	359.84	5,084.65	78.37	-0.27	78.37	12.00	12.00	0.00
5,200.00	45.29	359.84	5,161.90	141.59	-0.45	141.59	12.00	12.00	0.00
5,300.00	57.29	359.84	5,224.31	219.48	-0.67	219.48	12.00	12.00	0.00
5,400.00	69.29	359.84	5,269.17	308.65	-0.93	308.65	12.00	12.00	0.00
5,500.00	81.29	359.84	5,294.51	405.20	-1.20	405.20	12.00	12.00	0.00
5,572.55	90.00	359.84	5,300.01	477.46	-1.41	477.47	12.00	12.00	0.00
<b>Beg Hold @ 5572.5' MD / 5300.0' TVD, 90.00°, 0.00° Azi</b>									
5,600.00	90.00	359.84	5,300.01	504.92	-1.49	504.92	0.00	0.00	0.00
5,700.00	90.00	359.84	5,300.01	604.92	-1.77	604.92	0.00	0.00	0.00
5,800.00	90.00	359.84	5,300.01	704.92	-2.06	704.92	0.00	0.00	0.00
5,900.00	90.00	359.84	5,300.01	804.92	-2.34	804.92	0.00	0.00	0.00
6,000.00	90.00	359.84	5,300.01	904.92	-2.62	904.92	0.00	0.00	0.00
6,100.00	90.00	359.84	5,300.01	1,004.92	-2.91	1,004.92	0.00	0.00	0.00
6,200.00	90.00	359.84	5,300.01	1,104.91	-3.19	1,104.92	0.00	0.00	0.00
6,300.00	90.00	359.84	5,300.01	1,204.91	-3.48	1,204.92	0.00	0.00	0.00
6,400.00	90.00	359.84	5,300.01	1,304.91	-3.76	1,304.92	0.00	0.00	0.00
6,500.00	90.00	359.84	5,300.01	1,404.91	-4.05	1,404.92	0.00	0.00	0.00
6,600.00	90.00	359.84	5,300.01	1,504.91	-4.33	1,504.92	0.00	0.00	0.00
6,700.00	90.00	359.84	5,300.01	1,604.91	-4.62	1,604.92	0.00	0.00	0.00
6,800.00	90.00	359.84	5,300.01	1,704.91	-4.90	1,704.92	0.00	0.00	0.00
6,900.00	90.00	359.84	5,300.01	1,804.91	-5.19	1,804.92	0.00	0.00	0.00
7,000.00	90.00	359.84	5,300.01	1,904.91	-5.47	1,904.92	0.00	0.00	0.00
7,100.00	90.00	359.84	5,300.01	2,004.91	-5.75	2,004.92	0.00	0.00	0.00
7,200.00	90.00	359.84	5,300.01	2,104.91	-6.04	2,104.92	0.00	0.00	0.00
7,300.00	90.00	359.84	5,300.01	2,204.91	-6.32	2,204.92	0.00	0.00	0.00
7,400.00	90.00	359.84	5,300.01	2,304.91	-6.61	2,304.92	0.00	0.00	0.00
7,414.59	90.00	359.84	5,300.01	2,319.50	-6.65	2,319.51	0.00	0.00	0.00
<b>TD @ 7414.58' MD / 5300.01' TVD</b>									

Targets									
Target Name	Dip Angle	Dip Dir	TVD	N/S	E/W	Northing	Easting	Latitude	Longitude
- Name	(°)	(°)	(ft)	N	E	(ft)	(ft)		
BHL (Corral Fly Federal #2H)	0.00	0.00	5,300.01	2,319.50	-6.65	418,955.50	613,873.90	32° 09' 04.638" N	103° 57' 55.409" W
- plan misses by 14.59ft at 7400.00ft MD (5300.01 TVD, 2304.91 N, -6.61 E)									
- Point									
SECT 10 (Corral Fly Federal #2H)	0.00	0.00	0.00	-120.00	-1,980.00	416,516.00	611,900.55	32° 08' 40.562" N	103° 58' 18.459" W
- plan misses by 1983.58ft at 0.00ft MD (0.00 TVD, 0.00 N, -0.05 E)									
- Rectangle (sides W5,280.01 H5,280.01 D0.00)									

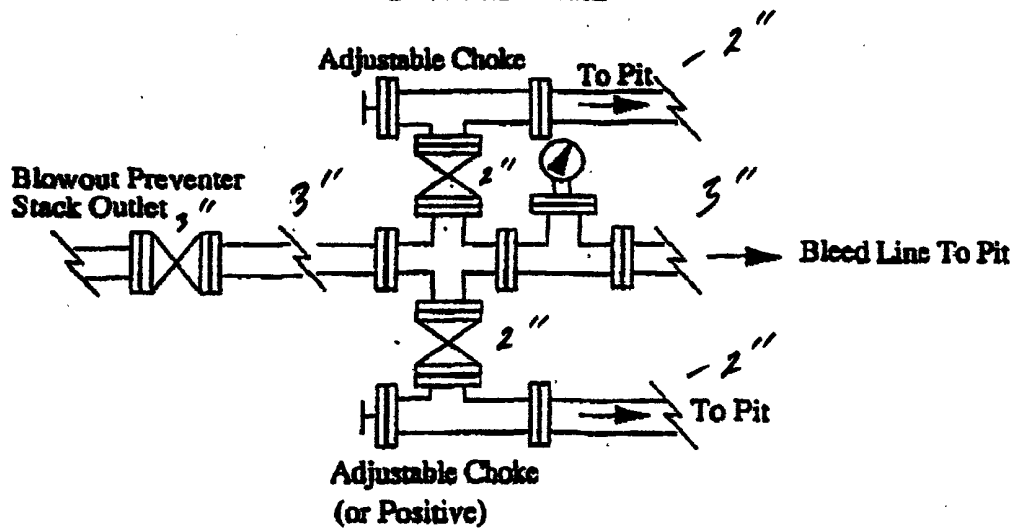
Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	N/S	E/W	
(ft)	(ft)	(ft)	(ft)	
4,822.54	4,822.54	0.00	0.00	Kickoff @ 4822.5' TVD, 12° DLS
5,572.55	5,300.01	477.46	-1.37	Beg Hold @ 5572.5' MD / 5300.0' TVD, 90.00°, 0.00° Azi
7,414.58	5,300.01	2,319.49	-6.65	TD @ 7414.58' MD / 5300.01' TVD

# BOPE SCHEMATIC

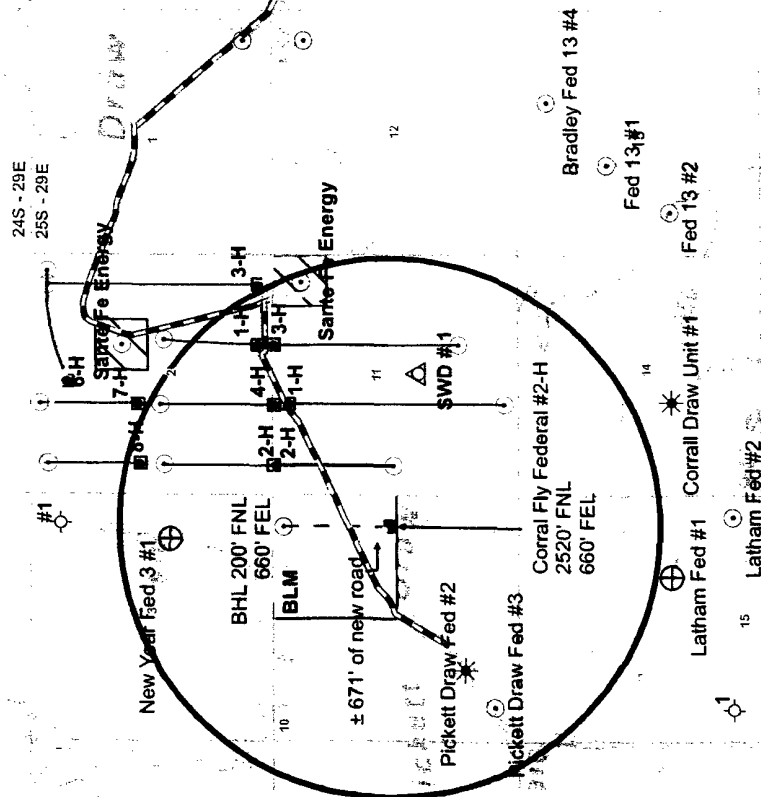
2 M  
BOP



Choke Manifold



# Exhibit # 4



**LEGEND** 1:48,000

	Federal
	State
	Surface Location
	Bottom Hole Location
	Existing Lease Rd



**SOUTHWESTERN  
ENERGY COMPANY**

Corral Fly Exhibit # 4

Interp. By:

Date: 02-16-2007

Drafted By: Mike Bailey

Project Path: Z:\GIS\Alan\_Grimsley

Projection: New Mexico East - Nad 27

Scale: 1" = 4,000'

## CONDITIONS OF APPROVAL - DRILLING

Operator's Name: Southwestern Energy Production  
Well Name & No. Corral Fly Federal # 2H  
Location: 2520'FNL, 660'FEL, SEC10, T25S, R29E, Eddy County, NM  
BHL: 200'FNL, 660'FEL, SEC10, T25S, R29E, Eddy County, NM  
Lease: NM-15303

### I. DRILLING OPERATIONS REQUIREMENTS:

A. The Bureau of Land Management (BLM) is to be notified a minimum of 4 hours in advance, at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 361-2822 - 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:

1. Spudding
2. Cementing casing: 9.625 inch 5.5 inch
3. BOP tests

B. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan is N/A.

C. 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.

D. 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. (R-111-P area only)

E. If floor controls are required, (3M or Greater) controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

### II. CASING:

A. The 9.625 inch surface casing shall be set above the salt, at least 25 feet into the Rustler Anhydrite @ approximately 750 feet and cement circulated to the surface.

1. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
2. Wait on Cement (WOC) time for a primary cement job will be a minimum of 12 hours for a non-water basin, 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compression strength, which ever is greater. (This is to include the lead cement)
3. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds of compression strength, which ever is greater.
4. If cement falls back, Remedial cementing shall be completed prior to drilling out that string.

B. The minimum required fill of cement behind the 5.5 inch production casing is cement shall circulate to the surface.

D. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.



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

- A. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2.
- B. Minimum working pressure of the blowout preventer and related equipment (BOPE) required for drilling below the 9.625 inch casing shall be 2000 psi.
- C. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - 1. The tests shall be done by an independent service company.
  - 2. The results of the test shall be reported to the appropriate BLM office.
  - 3. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of the independent service company test will be submitted to the appropriate BLM office.
  - 4. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi in accordance with API RP 53. The test will be held for a minimum of 10 minutes if the test is done with a test plug and 30 minutes without a test plug.
  - 5. A variance to test the BOP AND BOPE to the reduced pressure of 1000 psi with the rig pumps is approved the BOP/BOPE must be tested by an independent service company.

### **IV. Hazards:**

- 1. Our geologist has indicated that there is High Potential for Cave / Karst features.
- 2. Our geologist has indicated that there is potential for flows in the Salado and Delaware Mountain Group.
- 3. Our geologist has indicated that there is potential for lost circulation in the Delaware Mountain Group.

**Engineering may be contacted at 505-706-2779 for variances if necessary.**

**FWright 3/05/07**