

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

N.M. Oil Cons. DIV-Dist. 2  
1301 W. Grand Avenue  
Artesia, NM 88210

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

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NM 111927	
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" 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 N/A	
2. Name of Operator Edge Petroleum Operating Company, Inc. 224400		7. If Unit or CA Agreement, Name and No. N/A	
3a. Address 1301 Travis, Suite 2000 Houston, Texas 77002		8. Lease Name and Well No. 34990 Box Canyon 13 Federal #1	
3b. Phone No. (include area code) 713-654-8960		9. API Well No. 30-015-34252	
4. Location of Well (Report location clearly and in accordance with any State requirements) At surface 1185' FSL & 2035' FWL At proposed prod. zone		10. Field and Pool, or Exploratory Little Box Canyon - Morrow 80240	
14. Distance in miles and direction from nearest town or post office* 28 Miles West of Carlsbad		11. Sec., T. R. M. or Blk. and Survey or Area Sec 13, T21S, R21E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 1185'	16. No. of acres in lease 80	17. Spacing Unit dedicated to this well S/2 of Sec. 13	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth 8,900'	20. BLM/BIA Bond No. on file NMB 000121	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 4545'	22. Approximate date work will start* 06/15/2005	23. Estimated duration 35 Days	

RECEIVED

AUG 01 2005

OOD-ARTESIA

24. Attachments

Roswell 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 <i>Lindsay Truesdell</i>	Name (Printed/Typed) Lindsay Truesdell	Date 05/26/2005
Title Consultant		

Approved by (Signature) <i>/s/ Joe G. Lara</i>	Name (Printed/Typed) <i>/s/ Joe G. Lara</i>	Date JUL 29 2005
Title FIELD MANAGER		
Office CARLSBAD FIELD 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 Casing

APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS AND  
SPECIAL STIPULATIONS  
ATTACHED

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
**District II**  
1301 W. Grand Avenue, Artesia, NM 88210  
**District III**  
1000 Rio Brazos Road, Aztec, NM 87410  
**District IV**  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

For drilling and production facilities, submit to appropriate NMOCD District Office.  
For downstream facilities, submit to Santa Fe office

Form C-144  
June 1, 2004

### Pit or Below-Grade Tank Registration or Closure

Is pit or below-grade tank covered by a "general plan"? Yes ☒ No ☐

Type of action: Registration of a pit or below-grade tank ☒ Closure of a pit or below-grade tank ☐

Operator: <u>Edge Petroleum Operating Co., Inc.</u> Telephone: <u>(713) 654-8960</u> e-mail address: <u>lindsay@rkford.com</u>		
Address: <u>1301 Travis, Suite 2000, Houston, Texas 77002</u>		
Facility or well name: <u>Box Canyon 13 Fed #1</u> API #: <u>30-015-34252</u> U/L or Qtr/Qtr <u>N</u> Sec <u>13</u> T <u>21S</u> R <u>21E</u>		
County: <u>Eddy</u> Latitude <u>30°28'26.91"N</u> Longitude <u>104°45'32.42"W</u> NAD: 1927 <input type="checkbox"/> 1983 <input type="checkbox"/>		
Surface Owner: Federal <input checked="" type="checkbox"/> State <input type="checkbox"/> Private <input type="checkbox"/> Indian <input type="checkbox"/>		
<b>Pit</b>	<b>Below-grade tank</b>	
Type: Drilling <input checked="" type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/>	Volume: <u>      </u> bbl Type of fluid: <u>                    </u>	
Workover <input type="checkbox"/> Emergency <input type="checkbox"/>	Construction material: <u>                    </u>	
Lined <input checked="" type="checkbox"/> Unlined <input type="checkbox"/>	Double-walled, with leak detection? Yes <input type="checkbox"/> If not, explain why not. <u>                    </u>	
Liner type: Synthetic <input checked="" type="checkbox"/> Thickness <u>12</u> mil Clay <input type="checkbox"/>		
Pit Volume <u>      </u> bbl		
Depth to ground water (vertical distance from bottom of pit to seasonal high water elevation of ground water.)	Less than 50 feet	(20 points)
	50 feet or more, but less than 100 feet	(10 points)
	100 feet or more	( 0 points) 0
Wellhead protection area: (Less than 200 feet from a private domestic water source, or less than 1000 feet from all other water sources.)	Yes	(20 points)
	No	( 0 points) 0
Distance to surface water: (horizontal distance to all wetlands, playas, irrigation canals, ditches, and perennial and ephemeral watercourses.)	Less than 200 feet	(20 points)
	200 feet or more, but less than 1000 feet	(10 points)
	1000 feet or more	( 0 points) 0
Ranking Score (Total Points)		0

**If this is a pit closure:** (1) Attach a diagram of the facility showing the pit's relationship to other equipment and tanks. (2) Indicate disposal location: (check the onsite box if you are burying in place) onsite ☐ offsite ☐ If offsite, name of facility                     . (3) Attach a general description of remedial action taken including remediation start date and end date. (4) Groundwater encountered: No ☐ Yes ☐ If yes, show depth below ground surface        ft. and attach sample results.

(5) Attach soil sample results and a diagram of sample locations and excavations.

Additional Comments:

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that the above-described pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☒, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Date: 08/02/2005

Printed Name/Title Lindsay Truesdell

Signature

*Lindsay Truesdell*

Your certification and NMOCD approval of this application/closure does not relieve the operator of liability should the contents of the pit or tank contaminate ground water or otherwise endanger public health or the environment. Nor does it relieve the operator of its responsibility for compliance with any other federal, state, or local laws and/or regulations.

Approval:

Printed Name/Title Mike Bratcher Dist II

Signature *Mike Bratcher*

Date: AUG 04 2005

## DISTRICT I

1628 N. FRENCH DR., ROSA, NM 88240

## DISTRICT II

1301 W. GRAND AVENUE, ARIZONA, NM 88210

## DISTRICT III

1000 Rio Brazos Rd., Aztec, NM 87410

## DISTRICT IV

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

## State of New Mexico

Energy, Minerals and Natural Resources Department

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

Form C-102

Revised JUNE 10, 2003

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-34252	Pool Code 80240	Pool Name Little Box Canyon - Morrow
Property Code	Property Name BOX CANYON 13 FEDERAL	Well Number 1
OGED No. 22440	Operator Name EDGE PETROLEUM OPERATING CO., INC.	Elevation 4545'

## Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	13	21-S	21-E		1185	SOUTH	2035	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 320	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

<p style="text-align: center;">GEODETTIC COORDINATES NAD 27 NME</p> <p style="text-align: center;">Y=536467.5 N X=368727.1 E</p> <p style="text-align: center;">LAT.=32°28'26.91" N LONG.=104°45'32.42" W</p>	<p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify the information contained herein is true and complete to the best of my knowledge and belief.</p> <p><i>Lindsay Truesdell</i> Signature</p> <p>Lindsay Truesdell Printed Name</p> <p>Consultant Title</p> <p>May 25, 2005 Date</p>
	<p><b>SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>MAY 23, 2005</p> <p>Date Surveyed GS</p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><i>Gary Eidsen</i> 5/24/05 05110794</p> <p>Certificate No. GARY EIDSEN 12841</p>

MULTI POINT SURFACE USE AND OPERATIONS PLAN FOR

**EDGE PETROLEUM OPERATING COMPANY, INC.  
BOX CANYON 13 FEDERAL #1**

1185' FSL & 2035' FWL  
Section 13, T-21-S, R-21-E  
Eddy County, New Mexico  
Lease No.: USA NM 111927

This plan is submitted with the Application for Permit to Drill the above described well. The purpose of the plan is to describe the location of the proposed well, the proposed construction activities and operations plan to be followed in rehabilitating the surface and environmental effects associated with the operation.

1. EXISTING ROADS:

- A. **Exhibit "A"** is a Vicinity map showing the location of the proposed well as staked.
- B. **Directions:** From the intersection of Eddy Co. Road 401 (Marathon Rd) and Box Canyon Road (C.R. 400), go northwesterly, meandering along Box Canyon Road approximately 7.2 miles. Turn right and go northeast approximately 0.8 miles to proposed road stakes. Turn left and follow proposed road northwest approximately 0.1 miles to this location.

2. PLANNED ACCESS ROAD:

- A. **Length and Width:** **Exhibit "B"** is the proposed access road. It will be approximately 565' long and 12' wide running east to west of location
- B. **Construction:** The proposed access road will be constructed by grading and topping with compacted caliche. The surface will be properly drained.
- C. **Turnouts:** None required.
- D. **Culverts:** None necessary.
- E. **Cuts and Fills:** 3' cut to South with fill to North
- F. **Gates and Cattle Guards:** One Cattle Guard
- G. **Off lease right of way:** None required.

**3. LOCATION OF EXISTING WELLS:**

Existing wells in the immediate area are shown on the Location Verification Map, **Exhibit "C"**.

**4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES:**

- A. Edge Petroleum Operating Company, Inc. has no production facilities on the lease at this time.
- B. If the well proves to be commercial, the necessary production facilities, gas separation-process equipment and tank battery, if required, will be installed on the drilling pad.

**5. LOCATION AND TYPE OF WATER SUPPLY:**

It is planned to drill the proposed well with fresh water that will be obtained from private or commercial sources and will be transported over the existing and proposed access roads.

**6. SOURCE OF CONSTRUCTION MATERIAL:**

Caliche for surfacing the proposed access road and well site pad will be obtained from the location, if available, or from an approved Federal pit. No surface materials will be disturbed except those necessary for actual grading and leveling of the drill site and access road.

**7. METHODS OF HANDLING WASTE DISPOSAL:**

- A. Drill cuttings will be disposed of in the reserve pits.
- B. Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.
- C. All pits will be fenced with normal fencing materials to prevent livestock from entering the area.
- D. Water produced during operations will be collected in tanks until hauled to an approved disposal system, or a separate disposal application will be submitted to the BLM for approval.
- E. Oil Produced during tests will be stored in test tanks.
- F. Current laws and regulations pertaining to the disposal of human waste will be complied with.

- G. All trash and debris will be removed from the well site within 30 days after finishing drilling and/or completion operations.
8. ANCILLARY FACILITIES:
- None required.
9. WELL SITE LAYOUT:
- A. **Exhibit "D"** shows the relative location and dimensions of the well pad, reserve pits, and major rig components. The pad and pit area has been staked and flagged 600' x 600'.
- B. Mat Size: 230' x 330', plus 180' x 180' reserve pit on the north.
- C. Cut & Fill: 3' cut to South with fill to North
- D. The surface will be topped with compacted caliche and the reserve pits will be plastic lined.
10. PLANS FOR RESTORATION OF THE SURFACE:
- A. After completion of drilling and/or completion operations, all equipment and other material not needed for operations will be removed. The well site will be cleaned of trash leaving the site aesthetically pleasing to the extent possible.
- B. If the proposed well is non-productive, all rehabilitation and/or vegetation requirements of the Bureau of Land Management will be complied with and will be accomplished as expeditiously as possible. All pits will be filled and leveled as soon as they are dry enough to be worked.
11. OTHER INFORMATION:
- A. Surface Ownership - Bureau of Land Management
- B. Boone Archeological Services, LLC; 2030 NORTH CANAL STREET, CARLSBAD, NEW MEXICO 88220, conducted an archaeological survey. No significant archaeological resources were found in the area of the planned access road or of the proposed well site.
- C. Oil & Gas Lease:  
USA NM 111927      Township 21 South, Range 21 East,  
S/2 of Section 13

D. RECORD LESSEE:

Edge Petroleum Exploration Company

100%

E. BOND COVERAGE:

\$25,000 Statewide Oil & Gas Surety Bond

BLM Bond #: NMB 000121

12. OPERATOR'S REPRESENTATIVE:

The field representative for assuring compliance with the approved use and operations plan is as follows:

R. K. Ford & Associates  
415 West Wall, Suite 1700  
Midland, Texas 79701  
432-682-0440 (Office)  
432-682-0441 (Fax)  
432-570-7216 (Home)  
432-559-2222 (Cell)  
Randell@rkford.com (E-mail)

13. CERTIFICATION:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently 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 Edge Petroleum Operating Company, Inc. and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

May 25, 2005

  
Lindsay Truesdell Agent

**D. RECORD LESSEE:**

**Edge Petroleum Exploration Company**

**100%**

**E. BOND COVERAGE:**

**\$25,000 Statewide Oil & Gas Surety Bond**

**BLM Bond #: NMB 000121**

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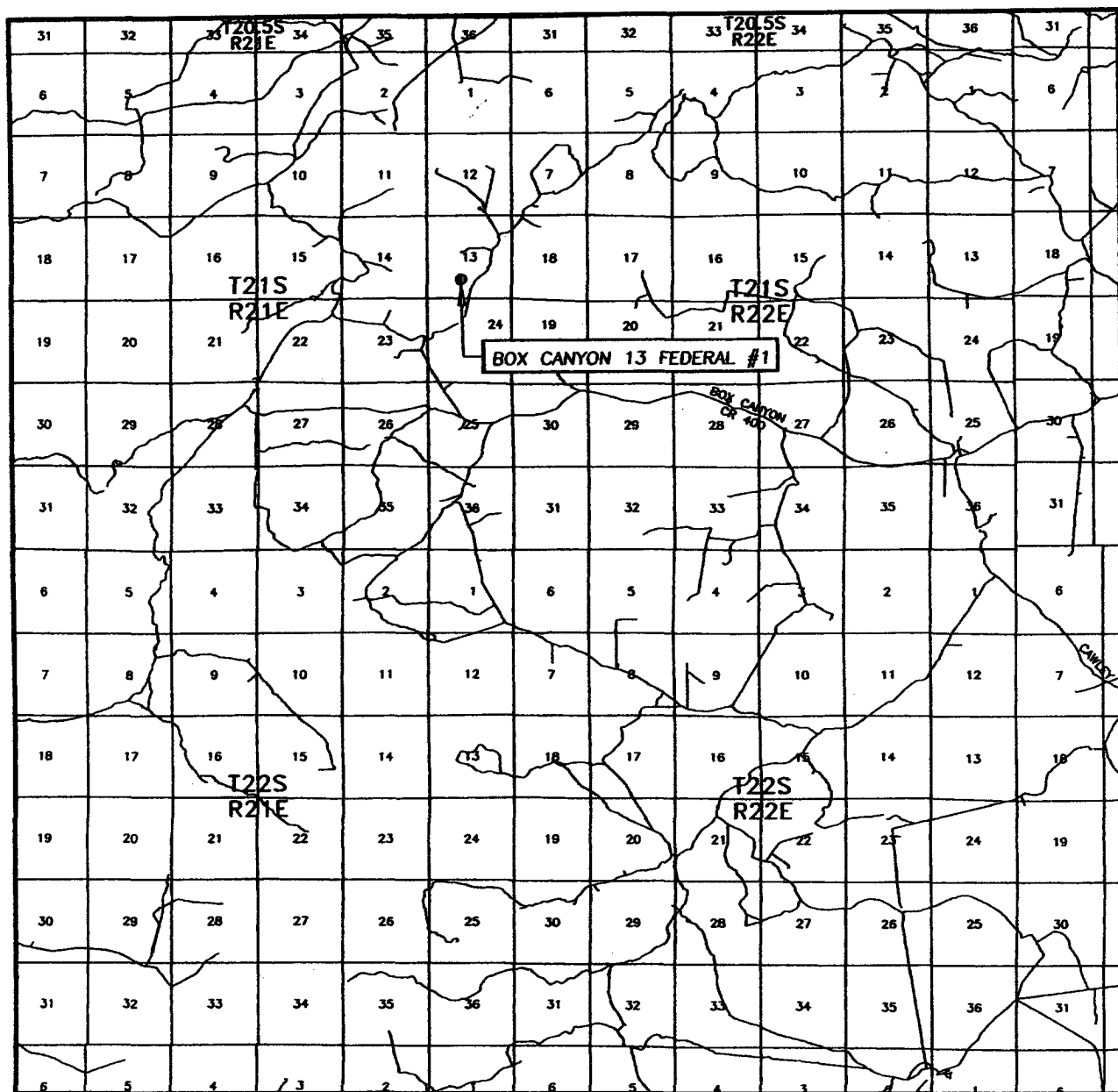
**May 25, 2005**

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**Lindsay Truesdell Agent**



# VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 13 TWP. 21-S RGE. 21-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 1185' FSL & 2035' FWL

ELEVATION 4545'

OPERATOR EDGE PETROLEUM OPERATING CO., INC.

LEASE BOX CANYON 13 FEDERAL

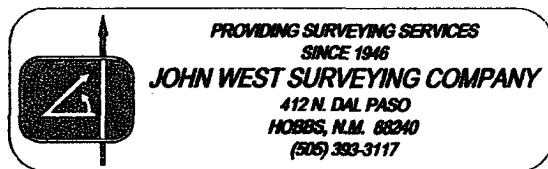
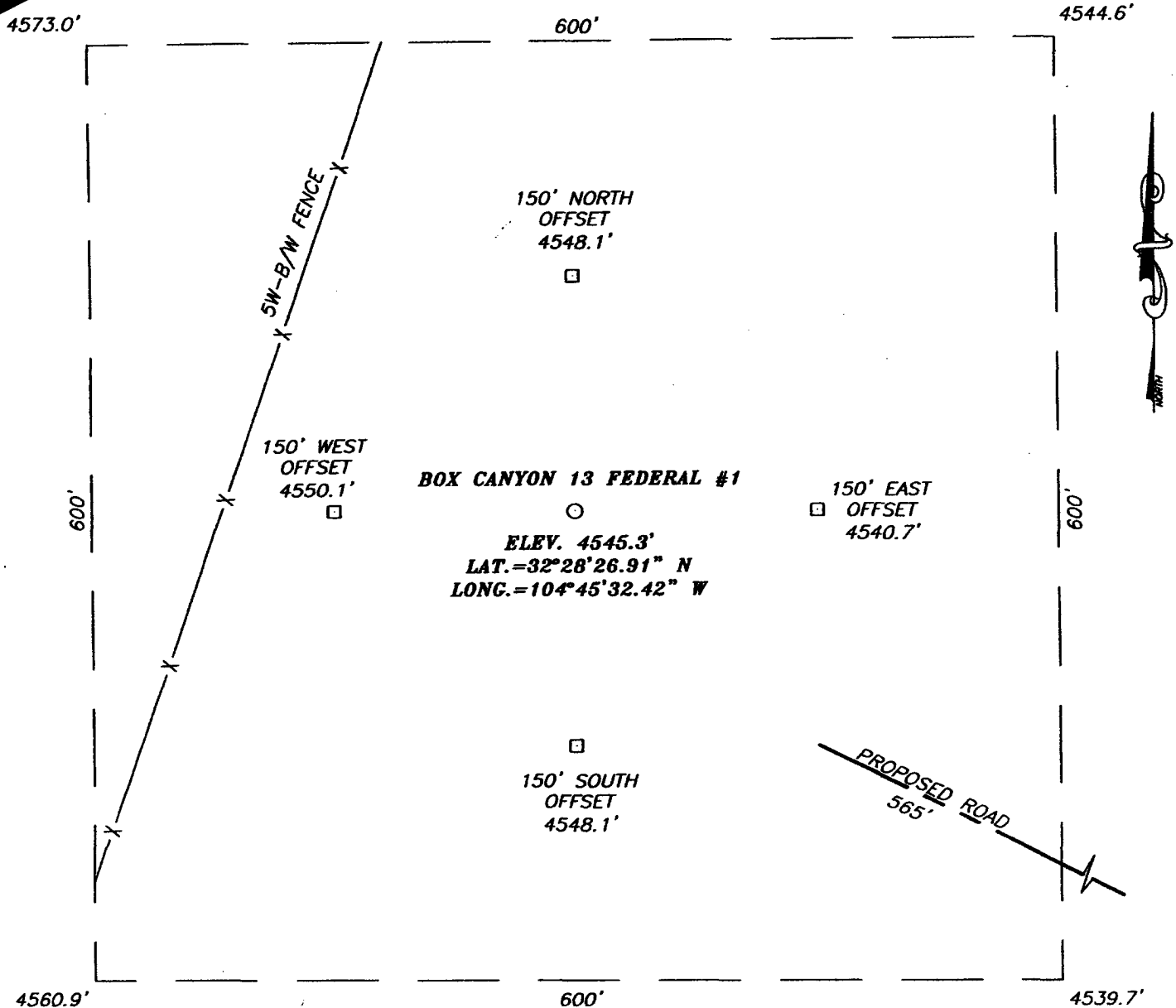


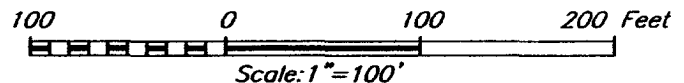
Exhibit "A"

13, TOWNSHIP 21 SOUTH, RANGE 21 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO



**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF EDDY CO. ROAD 401 (MARATHON RD.) AND BOX CANYON RD. (C.R. 400), GO NORTHWESTERLY, MEANDERING ALONG BOX CANYON RD. APPROX. 7.2 MILES, TURN RIGHT AND GO NORTHEAST APPROX. 0.8 MILES TO PROPOSED ROAD STAKES. TURN LEFT AND FOLLOW PROPOSED ROAD NORTHWEST APPROX. 0.1 MILES TO THIS LOCATION.



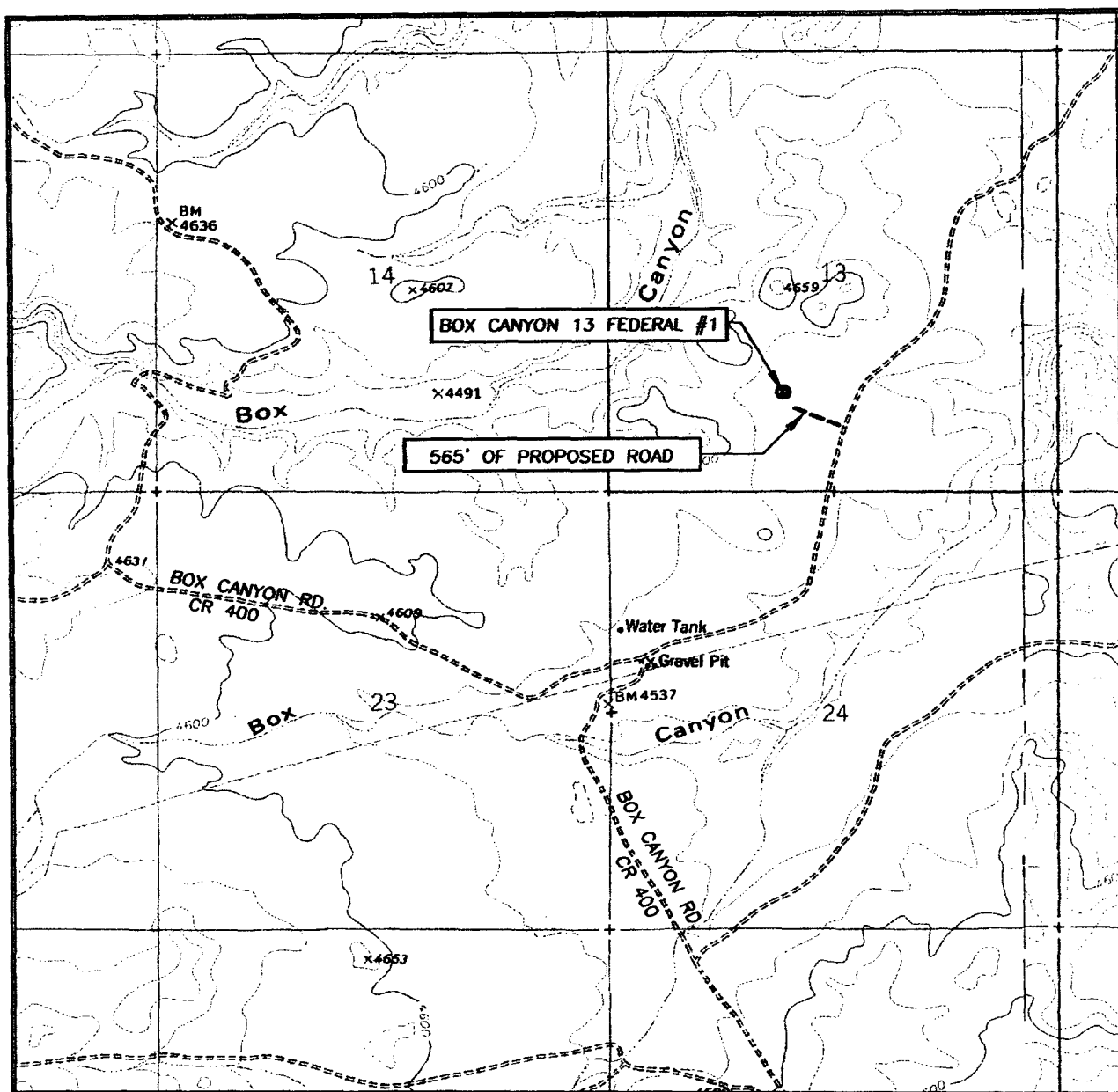
**EDGE PETROLEUM OPERATING CO., INC.**

BOX CANYON 13 FEDERAL #1 WELL  
LOCATED 1185 FEET FROM THE SOUTH LINE  
AND 2035 FEET FROM THE WEST LINE OF SECTION 13,  
TOWNSHIP 21 SOUTH, RANGE 21 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.

Survey Date: 05/23/05		Sheet 1 of 1 Sheets	
W.O. Number: 05.11.0794		Dr By: GS	Rev 1:N/A
Date: 05/05/05	Disk: CD#4	05110794	Scale: 1"=100'

Exhibit "B"

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

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

SEC. 13 TWP. 21-S RGE. 21-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 1185' FSL & 2035' FWL

ELEVATION 4545'

OPERATOR EDGE PETROLEUM  
OPERATING CO., INC.

LEASE BOX CANYON 13 FEDERAL

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

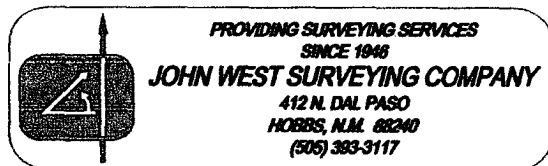
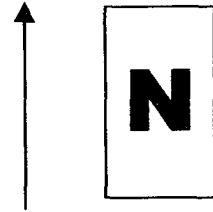


Exhibit "C"

Scale 1" = 100'

**DRILLING RIG LAYOUT**  
**Edge Petroleum Operating Company, Inc.**  
**Box Canyon 13 Federal #1**



**600'**

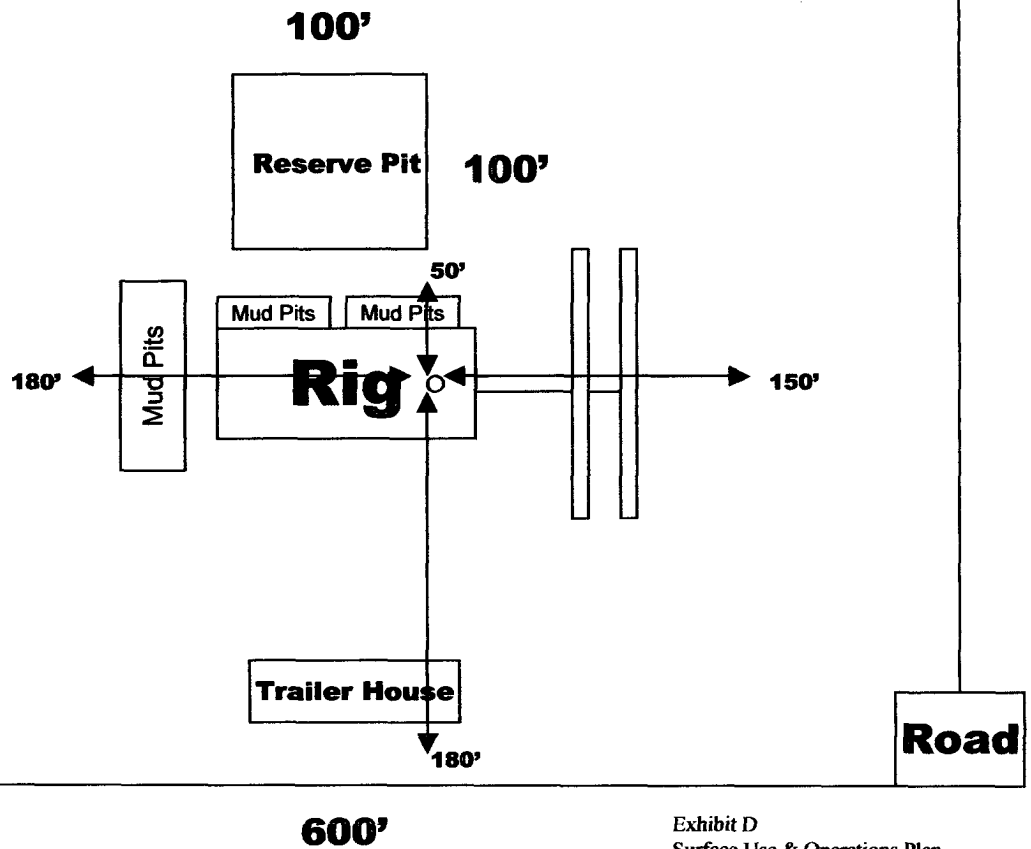


Exhibit D  
Surface Use & Operations Plan

## DRILLING PROGRAM

### **EDGE PETROLEUM OPERATING COMPANY, INC. BOX CANYON 13 FEDERAL #1**

**Section 13, T-21-S, R-21-E  
Eddy County, New Mexico**

**The following items supplement Form 3160-3 in accordance with instructions contained in Onshore Oil and Gas Orders #1 and #2, and all other applicable federal and state regulations.**

**1. ESTIMATED TOPS OF GEOLOGIC MARKERS:**

San Andres	252'
Glorietta	1,500'
Abo	3,359'
Wolfcamp	4,518'
Cisco	5,845'
Lower Canyon	6,619'
Strawn	7,212'
Atoka	7,622'
Morrow	7,984'
Chester	8,290'
Mississippi	8,400'
Total Depth	8,900'

**2. ESTIMATED DEPTHS TO WATER, OIL, OR GAS FORMATIONS:**

Fresh Water	Above 200'
Oil and Gas	San Andres, Bone Springs, Atoka, Strawn and Morrow

3. Pressure control equipment: The blow out preventer equipment (BOP) shown in Exhibit #1 will consist of a 3000 psi double ram type preventer for drilling the intermediate hole. The blowout preventer stack for the production hole will consist of at least a double-ram blowout preventer and annular preventer rated to 3000 psi working pressure. A diagram of the BOPs and choke manifold is attached. All BOPs and accessory equipment will be tested according to Onshore Order #2 before drilling out.

**4. PROPOSED CASING PROGRAM:**

<u>Hole Size</u>	<u>Interval</u>	<u>Casing Size</u>	<u>Weight</u>	<u>Grade, Joint</u>
17-1/2"	0 – 300'	13-3/8"	48#	H-40 ST&C
12-1/4"	0 – 1,550'	9-5/8"	36#	K-55 ST&C
8-1/2"	0 – 8,400'	5-1/2"	17#	N-80 LT&C

Equivalent or adequate grades and weights of casing may be substituted at time casing is run, depending on availability. Changes will be relayed to BLM prior to running.

5. PROPOSED CEMENTING PROGRAM

20" conductor	cemented with ready mix to surface
13-3/8" surface	250 sxs Premium Plus cement, 2% calcium chloride
9-5/8" intermediate	400 sxs Interfill "C" cement, 1/4# per sx Flocele 150 sxs Premium Plus cement
5-1/2" production	300 sxs Light Cement 300 sxs Super "H" cement .5% Halad, .4% CFR-3, 3# per sx Gilsonite

6. PROPOSED MUD SYSTEM:

<u>DEPTH</u>	<u>DESCRIPTION</u>	<u>MUD WEIGHT</u>	<u>VISCOSITY</u>	<u>WATER LOSS</u>
0' – 300'	fresh water	8.4 – 9.4 ppg	32 – 34	NC
300' – 1,550'	fresh water	8.4 ppg	28	NC
1,550' – 7,500'	fresh water	8.3 – 8.8 ppg	28	NC
7,500' – 8,400'	brine water	8.7 – 9.0 ppg	31 – 33	8 – 10 cc

7. TESTING, LOGGING AND CORING PROGRAM:

Samples	From 2,000'
DST's	Potential DST Zones: Wolfcamp reef, Strawn lm, Atoka sand, Mid/Lwr Morrow sd
Logging	Dual Lateral, Gamma Ray, Caliper, Density Neutron, PE Factor
Coring	Possible sidewall core: Grayburg, San Andres, Strawn lm, Atoka sand, Mid/Lwr Morrow sd

8. ABNORMAL PRESSURES AND TEMPERATURES:

None anticipated. Maximum bottom hole pressure should not exceed 4,900psi.  
This area has a potential H<sub>2</sub>S hazard. An H<sub>2</sub>S drilling plan is attached.

ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:

It is planned that operations will commence on June 15, 2005. Drilling should be completed within 35 days followed by completion operations.

# **HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

## **EDGE PETROLEUM OPERATING COMPANY, INC.**

**Box Canyon 13 Federal #1**

### **I. HYDROGEN SULFIDE TRAINING**

- A.** All regularly assigned personnel, contracted or employed by Cabal Energy Corporation, will receive training from a qualified instructor in the following areas prior to commencing drilling potential hydrogen sulfide bearing formations in this well:
  - 1.** The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S).
  - 2.** The proper use and maintenance of personal protective equipment and life support systems.
  - 3.** The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
  - 4.** The proper techniques for first aid and rescue procedures.
- B.** In addition, supervisory personnel will be trained in the following areas:
  - 1.** The effects of H<sub>2</sub>S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
  - 2.** Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
  - 3.** The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan.
- C.** There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

## **II. H<sub>2</sub>S SAFETY EQUIPMENT AND SYSTEMS**

**Note:** All H<sub>2</sub>S safety equipment and systems will be installed, tested and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H<sub>2</sub>S.

### **A. Well Control Equipment.**

- 1. Flare line with continuous pilot.**
- 2. Choke manifold with a minimum of one remote choke.**
- 3. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.**
- 4. Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head and flare.**

### **B. Protective Equipment for Essential Personnel:**

Mark II Surviveair 30-minute units located in the dog house and at briefing areas, as indicated on well site diagram.

### **C. H<sub>2</sub>S Detection and Monitoring Equipment:**

- 1. Two portable H<sub>2</sub>S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H<sub>2</sub>S levels of 20 ppm are reached.**
- 2. One portable SO<sub>2</sub> monitor positioned near flare line.**

### **D. Visual Warning Systems**

- 1. Wind direction indicators are shown on well site diagram.**
- 2. Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used when appropriate. See example attached.**

### **E. Mud Program**

- 1. The Mud Program has been designed to minimize the volume of H<sub>2</sub>S circulated to the surface. Proper mud weights, safe drilling practices and the use of H<sub>2</sub>S scavengers will minimize hazards when penetrating H<sub>2</sub>S bearing zones.**
- 2. A mud-gas separator will be utilized as needed.**



F. Metallurgy:

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

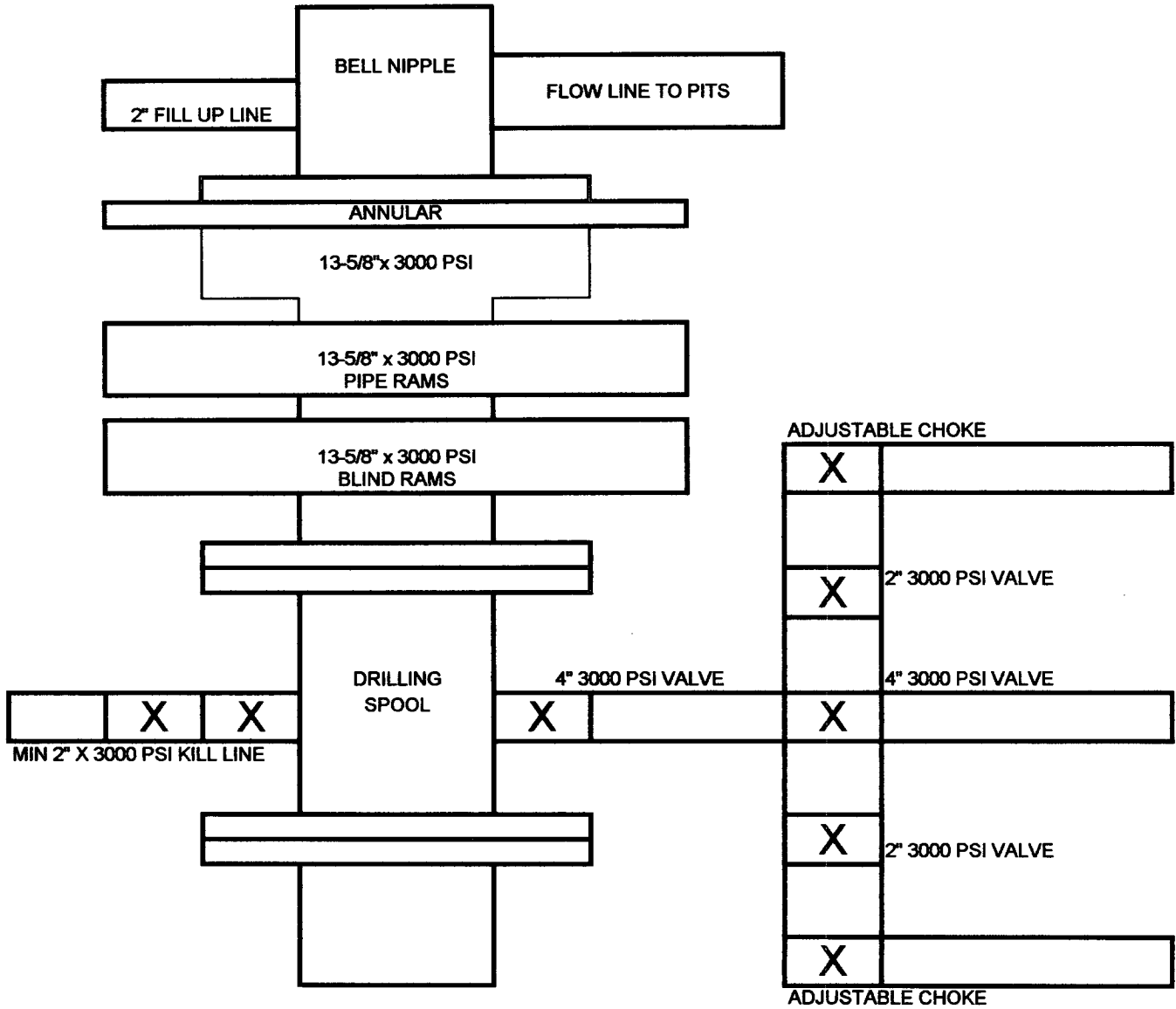
G. Communication:

Cellular telephone communications in company vehicles, rig floor and mud logging trailer.

H. Well Testing:

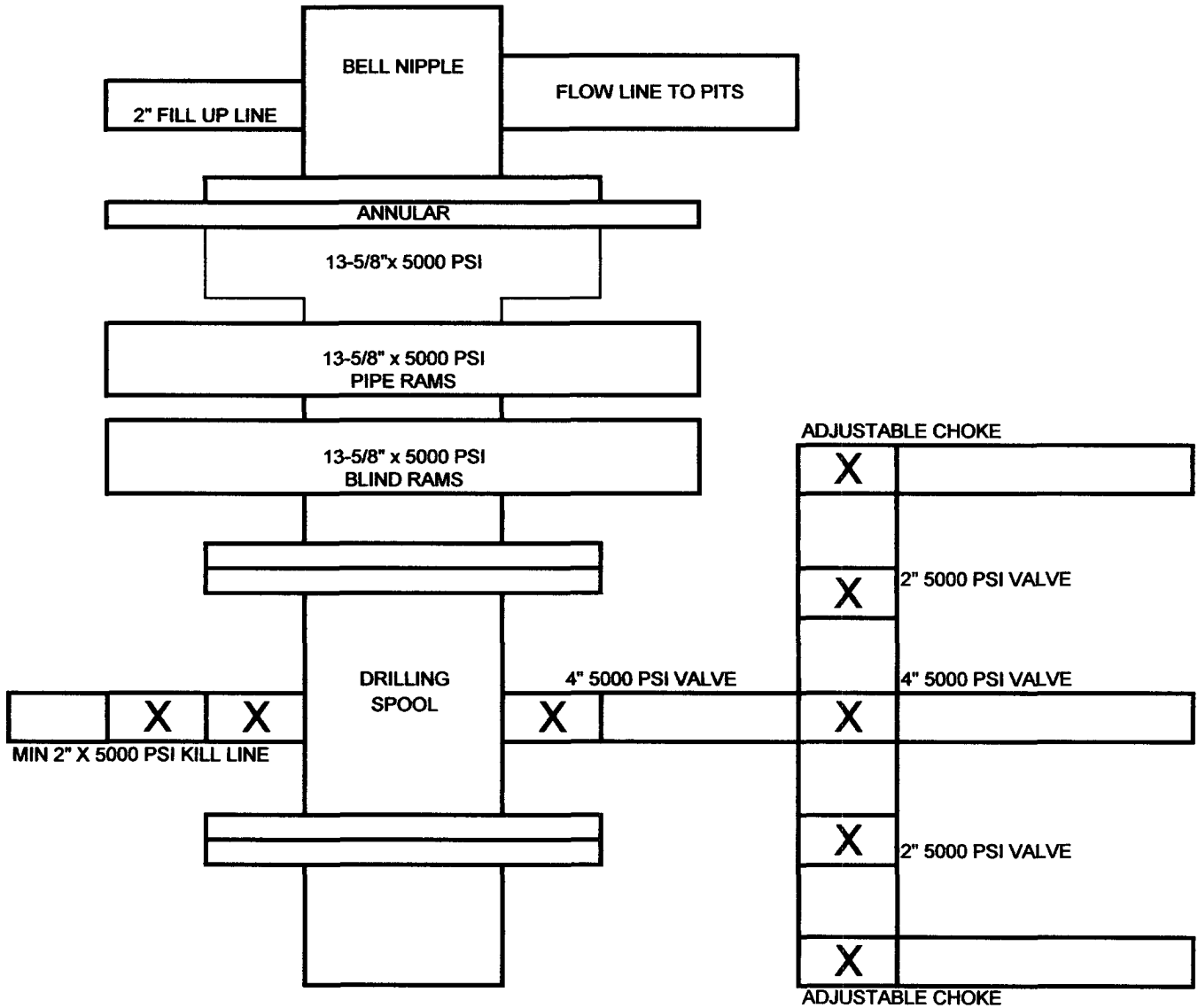
Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing and an H<sub>2</sub>S environment will be conducted during the daylight hours.

BOP SCHEMATIC FOR  
12-1/4" HOLE



Edge Petroleum Operating Company, Inc.  
Box Canyon 13 Federal #1  
Eddy County, New Mexico

BOP SCHEMATIC FOR  
8-1/2" HOLE



Edge Petroleum Operating Company, Inc.  
Box Canyon 13 Federal #1  
Eddy County, New Mexico

United States Department of the Interior  
Bureau of Land Management  
Roswell Field Office  
2909 Second Street  
Roswell, New Mexico 88201-1287

Statement Accepting Responsibility for Operations

Operator Name: Edge Petroleum Operating Company, Inc.  
Street or Box: 1301 Travis, Suite 2000  
City, State: Houston, Texas  
Zip Code: 77002

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

Lease No: USA NM 111927

Legal Description of Land:

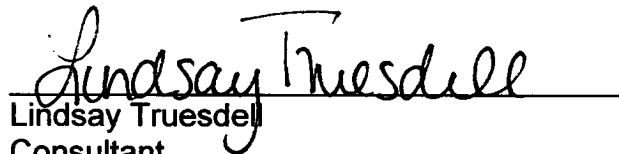
Township 21 South, Range 21 East, Eddy, New Mexico

S/2 of Section 13

Bond Coverage:

Statewide Oil and Gas Surety Bond, Edge Petroleum Operating Company, Inc.

BLM Bond File No.: NMB 000121

  
Lindsay Truesdell  
Consultant  
May 25, 2005

SPECIAL DRILLING STIPULATIONS

THE FOLLOWING DATA IS REQUIRED ON THE WELL SIGN

Operator's Name Edge Petroleum Operating Co., Inc. Well Name & No. 1-Box Canyon 13 Federal  
Location 1185' F S L & 2035' F W L Sec. 13, T. 21 S, R. 21 E.  
Lease No. NM-111927 County Eddy State New Mexico

The Special stipulations check marked below are applicable to the above described well and approval of this application to drill is conditioned upon compliance with such stipulations in addition to the General Requirements. The permittee should be familiar with the General Requirements, a copy of which is available from a Bureau of Land Management office. EACH PERMITTEE HAS THE RIGHT OF ADMINISTRATIVE APPEAL TO THESE STIPULATIONS PURSUANT TO TITLE 43 CRF 3165.3 AND 3165.4.

This permit is valid for a period of one year from the date of approval or until lease expiration or termination whichever is shorter.

I. SPECIAL ENVIRONMENT REQUIREMENTS

- ( ) Lesser Prairie Chicken (stips attached)  
( ) San Simon Swale (stips attached)

- ( ) Flood plain (stips attached)

(✓) Other See attached Archaeological Stipulations

II. ON LEASE - SURFACE REQUIREMENTS PRIOR TO DRILLING

- (✓) The BLM will monitor construction of this drill site. Notify the (✓) Carlsbad Field Office at (505) 234-5972 ( ) Hobbs Office (505) 393-3612, at least 3 working days prior to commencing construction.

- (✓) Roads and the drill pad for this well must be surfaced with 6 inches of compacted caliche upon completion of well and it is determined to be a producer.

- ( ) All topsoil and vegetation encountered during the construction of the drill site area will be stockpiled and made available for resurfacing of the disturbed area after completion of the drilling operation. Topsoil on the subject location is approximately \_\_\_\_\_ inches in depth. Approximately \_\_\_\_\_ cubic yards of topsoil material will be stockpiled for reclamation.

- (✓) Other. V-Door North (Reserve pits to the west)

III. WELL COMPLETION REQUIREMENTS

- ( ) A Communitization Agreement covering the acreage dedicated to the well must be filed for approval with the BLM. The effective date of the agreement must be prior to any sales.

- ( x ) Surface Restoration: If the well is a producer, the reserve pit(s) will be backfilled when dry, and cut-and-fill slopes will be reduced to a slope of 3:1 or less. All areas of the pad not necessary for production must be re-contoured to resemble the original contours of the surrounding terrain, and topsoil must be re-distributed and re-seeded with a drill equipped with a depth indicator (set at depth of ½ inch) with the following seed mixture, in pounds of Pure Live Seed (PLS), per acre.

- ( ) A. Seed Mixture 1 (Loamy Sites)  
Side Oats Grama (*Bouteloua curtipendula*) 5.0  
Sand Dropseed (*Sporobolus cryptandrus*) 1.0

- ( ) B. Seed Mixture 2 (Sandy Sites)  
Sand Dropseed (*Sporobolus cryptandrus*) 1.0  
Sand Lovegrass (*Eragrostis trichodes*) 1.0  
Plains Bristlegrass (*Setaria magrostachya*) 2.0


- (✓) C. Seed Mixture 3 (Shallow Sites)  
Side oats Grama (*Boute curtipendula*) 1.0

- ( ) D. Seed Mixture 4 (Gypsum Sites)  
Alkali Sacaton (*Sporobolus airoides*) 1.0  
Four-Wing Saltbush (*Atriplex canescens*) 5.0

- ( ) OTHER SEE ATTACHED SEED MIXTURE

Seeding should be done either late in the fall (September 15 - November 15, before freeze up, or early as possible the following spring to take advantage of available ground moisture.

- ( ) Other.

  
All above ground structures will be  
painted **FLAT non-reflective**  
Shale Green (5Y 4/2)

## 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 recontoured, 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 processed 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.



EXHIBIT NO. 05-NM-523-783-A

**CULTURAL RESOURCES STIPULATIONS**

**Box Canyon "13" Federal #1 Well Pad and Access Road**

**Lease Number NM-111927**



**CONDITIONS OF APPROVAL:**

**Reducing and avoiding effects:** A protected cultural property (Archaeological Site #LA 148,513) is located abutting the western edge of the area surveyed for the well pad. In order to proceed with construction without damaging the buried archaeological resource, the following stipulations shall be implemented by Edge Petroleum Operating Company, Inc. (Agent: R.K. Ford & Associates), and the responsible field construction managers and personnel:

**I. PROFESSIONAL ARCHAEOLOGICAL MONITORING IS REQUIRED FOR THIS PROJECT.**

- A. A copy of these stipulations shall be supplied to the archaeological monitor at least two (2) working days prior to the start of construction activities.
- B. No construction activities, including vegetation removal, may begin before the arrival of the archaeological monitor.

**II. THE ARCHAEOLOGICAL MONITOR WILL:**

- A. Ensure that a no construction, vehicle traffic, spoil piles, or other construction-related activity occurs within 100 feet of Archaeological Site Number LA 148,513, as depicted on the attached map.
- B. Ensure that the site protection barrier is located as indicated on the attached map(s).
- C. Observe all surface disturbing activities within 200' feet of Archaeological site Number LA 148,513 (see attached map(s)).
- D. Submit a report of monitoring activities within thirty (30) days of completion of monitoring. These stipulations must be attached to the report

**III. SITE BARRIER/FENCING:**

- A. A temporary site protection barrier shall be erected prior to construction. The barrier shall, at a minimum, consist of upright wooden survey lath spaced no more than ten (10) feet apart and marked with blue ribbon flagging or blue paint. There shall be no construction activities or vehicular traffic past the barrier. The barrier shall remain in place through reclamation and reseeding.
- B. The barrier shall be placed as indicated on the attached map.
- C. If any cultural resource (historic or prehistoric object or material) is unearthed during construction or drilling operations, the discovery shall be immediately reported to the Carlsbad Field Office (CFO). All operations in the immediate vicinity (50') of such discovery shall cease until written authorization to proceed is issued by the CFO. An evaluation of the discovery will be made by CFO specialists to determine appropriate actions to prevent the loss of significant cultural or scientific values.

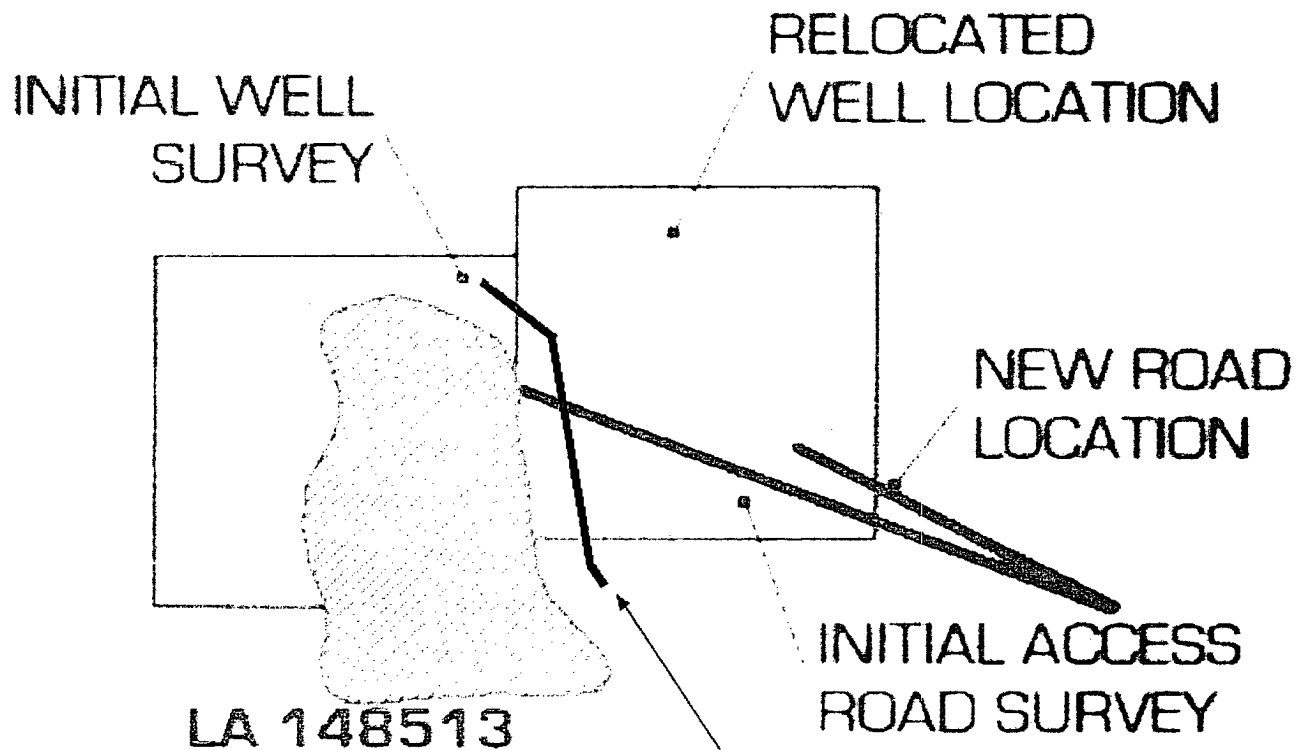
**SITE PROTECTION AND EMPLOYEE EDUCATION:** Please help us protect cultural resources. Inform all employees of the project that cultural and archaeological sites are to be avoided by all personnel, personal vehicles, and company equipment. Also, inform all employees that it is illegal to collect, damage or disturb cultural resources on federal lands.

**BLM Contacts:** Mr. Gary Navarre, Carlsbad Field Office, 620 E. Greene St., Carlsbad, NM 88220; (505) 234-5980.  
Mr. Bruce Boeke, Carlsbad Field Office, 620 E. Greene St., Carlsbad, NM 88220; (505) 234-5917

Exhibit No. 05-NM-523-783-B.

Temporary Barrier Location

**Box Canyon 13 Federal No. 1**



**Temporary Barrier Location**

To be constructed ca. 100' from archaeological site

SCALE 1:10,000



## CONDITIONS OF APPROVAL - DRILLING

Operator's Name: Edge Petroleum Operating Company, Inc.  
Well Name & No. Box Canyon 13 Federal #1  
Location: 1185' FSL, 2035' FWL, Section 13, T. 21 S., R. 21 E., Eddy County, New Mexico  
Lease: NM-111927

### I. 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 9-5/8 inch 5-1/2 inch
  - C. BOP tests
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
3. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing (size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15-day time frame.
4. The API No. assigned to the well by NMOCD shall be included on the subsequent report of setting the first casing string.
5. A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales.

### II. CASING:

1. The 13-3/8 inch surface casing shall be set at approximately 300 feet and cement circulated to the surface. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.
2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is to be circulated to the surface.
3. The minimum required fill of cement behind the 5-1/2 inch production casing is to reach at least 500 feet above the top of the uppermost hydrocarbon productive interval.

### 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.

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

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

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

BLM Serial Number: NM-111927  
Company Reference: Edge Petroleum Operating Co., Inc.  
Well No. & Name: 1-Box Canyon 13 Federal

STANDARD STIPULATIONS FOR PERMANENT RESOURCE ROADS  
CARLSBAD FIELD OFFICE

A copy of the grant and attachments, including stipulations and map, will be on location during construction. BLM personnel may request to view a copy of your permit during construction to ensure compliance with all stipulations.

The holder/grantee/permittee shall hereafter be identified as the holder in these stipulations. The Authorized Officer is the person who approves the Application for Permit to Drill (APD) and/or Right-of-Way (ROW).

GENERAL REQUIREMENTS

A. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

B. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, *et. seq.*) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized by this grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

C. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et. seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et. seq.*) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way). This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

D. If, during any phase of the construction, operation, maintenance, or termination of the road, any oil or other pollutant should be discharged, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all

damages to Federal lands resulting therefrom, the Authorized

Officer may take such measures as deemed necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any liability or responsibility.

E. The holder shall minimize disturbance to existing fences and other improvements on public domain surface. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times.

The holder will make a documented good-faith effort to contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence.

F. The Holder shall ensure that the entire right-of-way, including the driving surface, ditching and drainage control structures, road verges and any construction sites or zones, will be kept free of the following plant species: Malta starthistle, African rue, Scotch thistle and salt cedar.

Holder agrees to comply with the following stipulations:

1. ROAD WIDTH AND GRADE

The road will have a driving surface of 14 feet (all roads shall have a minimum driving surface of 12 feet, unless local conditions dictate a different width). The maximum grade is 10 percent unless the box below is checked. Maximum width of surface disturbance from construction will be 30 feet.

☐ Those segments of road where grade is in excess of 10% for more than 300 feet shall be designed by a professional engineer.

2. CROWNING AND DITCHING

Crowning with materials on site and ditching on one side of the road on the uphill side will be required. The road cross-section will conform to the cross section diagrams in Figure 1. If conditions dictate, ditching may be required for both sides of the road; if local conditions permit, a flat-bladed road may be considered (if these conditions exist, check the appropriate box below). The crown shall have a grade of approximately 2% (i.e., 1" crown on a 12' wide road).

☒ Ditching will be required on both sides of the roadway as shown on the attached map or as staked in the field.

☐ Flat-blading is authorized on segment(s) delineated on the attached map.

### 3. DRAINAGE

Drainage control shall be ensured over the entire road through the use of borrow ditches, outsloping, insloping, natural rolling topography, lead-off (turnout) ditches, culverts, and/or drainage dips.

A. All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval for lead-off ditches shall be determined according to the following table, but may be amended depending upon existing soil types and centerline road slope (in %):

#### SPACING INTERVAL FOR TURNOUT DITCHES

Percent slope	Spacing interval
0% - 4%	400' - 150'
4% - 6%	250' - 125'
6% - 8%	200' - 100'
8% - 10%	150' - 75'

A typical lead-off ditch has a minimum depth of 1 foot below and a berm 6 inches above natural ground level. The berm will be on the down-slope side of the lead-off ditch. The ditch end will tie into vegetation whenever possible.

For this road the spacing interval for lead-off ditches shall be at

☒ 400 foot intervals.

☒ 200 foot intervals.

☐ locations staked in the field as per spacing intervals above.

☐ locations delineated on the attached map.

B. Culvert pipes shall be used for cross drains where drainage dips or low water crossings are not feasible. The minimum culvert diameter must be 18 inches. Any culvert pipe installed shall be of sufficient diameter to pass the anticipated flow of water. Culvert location and required diameter are shown on the attached map (Further details can be obtained from the Roswell District Office or the appropriate Resource Area Office).

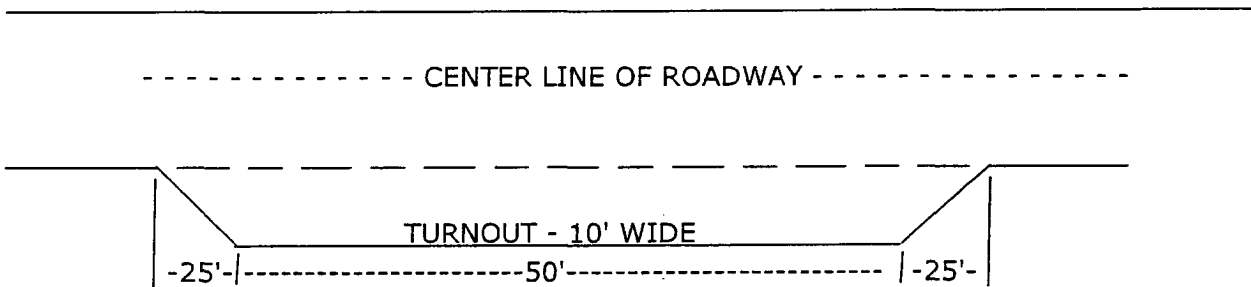
C. On road slopes exceeding 2%, drainage dips shall drain water into an adjacent lead-off ditch. Drainage dip location and spacing shall be determined by the formula:

$$\text{spacing interval} = \frac{400'}{\text{road slope in \%}} + 100'$$

Example: 4% slope: spacing interval = 400 + 100 = 200 feet

#### 4. TURNOUTS

Unless otherwise approved by the Authorized Officer, vehicle turnouts will be required. Turnouts will be located at 2000-foot intervals, or the turnouts will be intervisible, whichever is less. Turnouts will conform to the following diagram:



STANDARD TURNOUT - PLAN VIEW

#### 5. SURFACING

Surfacing of the road or those portions identified on the attached map may, at the direction of the Authorized Officer, be required, if necessary, to maintain traffic within the right-of-way with caliche, gravel, or other surfacing material which shall be approved by the Authorized Officer. When surfacing is required, surfacing materials will be compacted to a minimum thickness of six inches with caliche material. The width of surfacing shall be no less than the driving surface. Prior to using any mineral materials from an existing or proposed Federal source, authorization must be obtained from the Authorized Officer.

A sales contract for the removal of mineral materials (caliche, sand, gravel, fill dirt, etc.) from an authorized pit, site, or on location must be obtained from the BLM prior to using any such mineral material from public lands. Contact the BLM solid minerals staff for the various options to purchase mineral material.

#### 6. CATTLEGUARDS

Where used, all cattleguard grids and foundation designs and construction shall meet the American Association of State Highway and Transportation Officials (AASHTO) Load Rating H-20, although AASHTO U-80 rated grids shall be required where heavy loads (exceeding H-20 loading), are anticipated (See BLM standard drawings for cattleguards). Cattleguard grid length shall not be less than 8 feet and width of not less than 14 feet. A wire gate (16-foot minimum width) will be provided on one side of the cattleguard unless requested otherwise by the surface user.

7. MAINTENANCE

The holder shall maintain the road in a safe, usable condition. A maintenance program shall include, but not be limited to blading, ditching, culvert installation, culvert cleaning, drainage installation, cattleguard maintenance, and surfacing.

8. PUBLIC ACCESS

Public access along this road will not be restricted by the holder without specific written approval being granted by the Authorized Officer. Gates or cattleguards on public lands will not be locked or closed to public use unless closure is specifically determined to be necessary and is authorized in writing by the Authorized Officer.

9. CULTURAL RESOURCES

Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the authorized officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the authorized officer after consulting with the holder.

10. SPECIAL STIPULATIONS: *None*

# ***CONTINGENCY PLAN***

**Edge Petroleum Operating Company, Inc.**

**Box Canyon 13 Federal**

1185' FSL & 2035' FWT  
Section 13: T-21-S R-21-E  
Eddy County, New Mexico

RECEIVED  
AUG 03 2005  
ODD-ARTS/M

**Prepared For:  
Date Prepared:**

**Edge Petroleum Operating Company, Inc.  
August 2, 2005**

**Prepared By:**

**INDIAN  
Fire & Safety, Inc.**



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## HYDROGEN SULFIDE CONTINGENCY PLAN

### SCOPE

THIS CONTINGENCY PLAN ESTABLISHES GUIDELINES FOR THE PUBLIC, ALL COMPANY EMPLOYEES WHO'S WORK ACTIVITIES MAY INVOLVE EXPOSURE TO HYDROGEN SULFIDE (H<sub>2</sub>S) GAS.

### OBJECTIVE

1. PREVENT ANY AND ALL ACCIDENTS, AND PREVENT THE UNCONTROLLED RELEASE OF HYDROGEN SULFIDE INTO THE ATMOSPHERE.
2. PROVIDE PROPER EVACUATION PROCEDURES TO COPE WITH EMERGENCIES.
3. PROVIDE IMMEDIATE AND ADEQUATE MEDICAL ATTENTION SHOULD AN INJURY OCCUR.

## H2S CONTINGENCY PLAN

### DISCUSSION

#### GEOLOGICAL PROGNOSIS

IMPLEMENTATION:	THIS PLAN WITH ALL DETAILS IS TO BE FULLY IMPLEMENTED AFTER DRILLING TO <u>INTERMEDIATE CASING POINT</u> .
EMERGENCY RESPONSE PROCEDURE:	THIS SECTION OUTLINES THE CONDITIONS AND DENOTES STEPS TO BE TAKEN IN THE EVENT OF AN EMERGENCY.
EMERGENCY EQUIPMENT PROCEDURE:	THIS SECTION OUTLINES THE SAFETY AND EMERGENCY EQUIPMENT THAT WILL BE REQUIRED FOR THE DRILLING OF THIS WELL.
TRAINING PROVISIONS:	THIS SECTION OUTLINES THE TRAINING PROVISIONS THAT MUST BE ADHERED TO PRIOR TO DRILLING <u>TO INTERMEDIATE CASING POINT</u> .
DRILLING EMERGENCY CALL LISTS:	INCLUDED ARE THE TELEPHONE NUMBERS OF ALL PERSONS TO BE CONTACTED SHOULD AN EMERGENCY EXIST.
BRIEFING:	THIS SECTION DEALS WITH THE BRIEFING OF ALL PEOPLE INVOLVED IN THE DRILLING OPERATION.
PUBLIC SAFETY:	PUBLIC SAFETY PERSONNEL WILL BE MADE AWARE OF THE DRILLING OF THIS WELL.
CHECK LISTS:	STATUS CHECK LISTS AND PROCEDURAL CHECK LISTS HAVE BEEN INCLUDED TO INSURE ADHERENCE TO THE PLAN.
GENERAL INFORMATION:	A GENERAL INFORMATION SECTION HAS BEEN INCLUDED TO SUPPLY SUPPORT INFORMATION.

## H2S CONTINGENCY PLAN

### **EMERGENCY PROCEDURES**

- A. IN THE EVENT OF ANY EVIDENCE OF H2S LEVEL ABOVE 10 PPM, TAKE THE FOLLOWING STEPS:
  - 1. SECURE BREATHING EQUIPMENT.
  - 2. ORDER NON-ESSENTIAL PERSONNEL OUT OF DANGER ZONE.
  - 3. TAKE STEPS TO DETERMINE IF THE H2S LEVEL CAN BE CORRECTED OR SUPPRESSED AND, IF SO, PROCEED IN NORMAL OPERATION.
- B. IF UNCONTROLLABLE CONDITIONS OCCUR:
  - 1. TAKE STEPS TO PROTECT AND/OR REMOVE ANY PUBLIC IN THE DOWN-WIND AREA FROM THE RIG – PARTIAL EVACUATION AND ISOLATION. NOTIFY NECESSARY PUBLIC SAFETY PERSONNEL AND THE BUREAU OF LAND MANAGEMENT OF THE SITUATION.
  - 2. REMOVE ALL PERSONNEL TO SAFE BREATHING AREA.
  - 3. NOTIFY PUBLIC SAFETY PERSONNEL TO SAFE BREATHING AREA.
  - 4. PROCEED WITH BEST PLAN (AT THE TIME) TO REGAIN CONTROL OF THE WELL. MAINTAIN TIGHT SECURITY AND SAFETY PROCEDURES.
- C. RESPONSIBILITY:
  - 1. DESIGNATED PERSONNEL.
    - a. SHALL BE RESPONSIBLE FOR THE TOTAL IMPLEMENTATION OF THIS PLAN.
    - b. SHALL BE IN COMPLETE COMMAND DURING ANY EMERGENCY.
    - c. SHALL DESIGNATE A BACK-UP.

## **EMERGENCY PROCEDURES**

\*(Procedures are the same for both Drilling and Tripping)

- |                   |   |
|-------------------|---|
| ALL PERSONNEL:    | <ol style="list-style-type: none"><li>1. ON ALARM, DON ESCAPE UNIT AND REPORT IN UP WIND BRIEFING AREA.</li><li>2. CHECK STATUS OF PERSONNEL (BUDDY SYSTEM).</li><li>3. SECURE BREATHING EQUIPMENT.</li><li>4. AWAIT ORDERS FROM SUPERVISOR.</li></ol>  |
| DRILLING FOREMAN: | <ol style="list-style-type: none"><li>1. REPORT TO UP WIND BRIEFING AREA.</li><li>2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH TOOL PUSHER OR DRILLER (BUDDY SYSTEM).</li><li>3. DETERMINE H<sub>2</sub>S CONCENTRATIONS.</li><li>4. ASSESS SITUATION AND TAKE CONTROL MEASURES.</li></ol>  |
| TOOL PUSHER:      | <ol style="list-style-type: none"><li>1. REPORT TO UP WIND BRIEFING AREA.</li><li>2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH DRILLING FOREMAN OR DRILLER (BUDDY SYSTEM).</li><li>3. DETERMINE H<sub>2</sub>S CONCENTRATION.</li><li>4. ASSESS SITUATION AND TAKE CONTROL MEASURES.</li></ol>  |
| DRILLER:          | <ol style="list-style-type: none"><li>1. DON ESCAPE UNIT.</li><li>2. CHECK MONITOR FOR POINT OF RELEASE.</li><li>3. REPORT TO BRIEFING AREA.</li><li>4. CHECK STATUS OF PERSONNEL (IN AN ATTEMPT TO RESCUE, USE THE BUDDY SYSTEM).</li><li>5. ASSIGNS LEAST ESSENTIAL PERSON TO NOTIFY DRILLING FOREMAN AND TOOL PUSHER BY QUICKEST MEANS IN CASE OF THEIR ABSENCE.</li><li>6. ASSUMES THE RESPONSIBILITIES OF THE DRILLING FORMAN AND TOOL PUSHER UNTIL THEY ARRIVE SHOULD THEY BE ABSENT.</li></ol> |

## **EMERGENCY PROCEDURES**

DERRICK MAN  
FLOOR MAN #1  
FLOOR MAN #2

1. WILL REMAIN IN BRIEFING AREA UNTIL INSTRUCTED BY SUPERVISOR.

MUD ENGINEER:

1. REPORT TO BRIEFING AREA.
2. WHEN INSTRUCTED, BEGIN CHECK OF MUD FOR PH AND H<sub>2</sub>S LEVEL. (GARETT GAS TRAIN.)

SAFETY PERSONNEL:

1. MASK UP AND CHECK STATUS OF ALL PERSONNEL AND SECURE OPERATIONS AS INSTRUCTED BY DRILLING FOREMAN AND REPORT TO BRIEFING AREA.

## **TAKING A KICK**

WHEN TAKING A KICK DURING AN H<sub>2</sub>S EMERGENCY, ALL PERSONNEL WILL FOLLOW STANDARD BOP PROCEDURES AFTER REPORTING TO BRIEFING AREA AND MASKING UP.

## **OPEN-HOLE LOGGING**

ALL UNNECESSARY PERSONNEL OFF FLOOR. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD MONITOR CONDITION, ADVISE STATUS AND DETERMINE NEED FOR USE OF AID EQUIPMENT.

## **RUNNING CASING OR PLUGGING**

FOLLOWING THE SAME "TRIPPING" PROCEDURE AS ABOVE. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD DETERMINE IF ALL PERSONNEL HAVE ACCESS TO PROTECTIVE EQUIPMENT.

## H2S CONTINGENCY PLAN

### **IGNITION PROCEDURES**

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF COMPANY FOREMAN. IN THE EVENT HE IS INCAPACITATED, IT BECOMES THE RESPONSIBILITY OF THE CONTRACT RIG TOOL PUSHER. THE DECISION SHOULD BE MADE ONLY AS A LAST RESORT AND IN A SITUATION WHERE IT IS CLEAR THAT:

1. HUMAN LIFE AND PROPERTY ARE ENDANGERED.
2. THERE IS NO HOPE CONTROLLING THE BLOWOUT UNDER THE PREVAILING CONDITIONS AT THE WELL.

NOTIFY THE DISTRICT OFFICE IF TIME PERMITS, BUT DO NOT DELAY IF HUMAN LIFE IS IN DANGER.

INITIATE FIRST PHASE OF EVACUATION PLAN.

## **IGNITION PROCEDURES**

### **INSTRUCTIONS FOR IGNITING THE WELL**

1. TWO PEOPLE ARE REQUIRED FOR THE ACTUAL IGNITING OPERATION. THEY MUST WEAR SELF-CONTAINED BREATHING UNITS AND HAVE SAFETY ROPE ATTACHED. ONE MAN (TOOL PUSHER OR SAFETY ENGINEER) WILL CHECK THE ATMOSPHERE FOR EXPLOSIVE GASES WITH THE EXPLOSIMETER. THE OTHER MAN (DRILLING FOREMAN) IS RESPONSIBLE FOR IGNITING THE WELL.
2. PRIMARY METHOD TO IGNITE: 25 MM FLARE GUN WITH RANGE OF APPROXIMATELY 500 FEET.
3. IGNITE UP WIND AND DO NOT APPROACH ANY CLOSER THAN IS WARRANTED.
4. SELECT THE IGNITION SITE BEST FOR PROTECTION, AND WHICH OFFERS AN EASY ESCAPE ROUTE.
5. BEFORE FIRING, CHECK FOR PRESENCE OF COMBUSTIBLE GAS.
6. AFTER LIGHTING, CONTINUE EMERGENCY ACTION AND PROCEDURE AS BEFORE.
7. ALL UNASSIGNED PERSONNEL WILL LIMIT THEIR ACTIONS TO THOSE DIRECTED BY THE DRILLING FOREMAN.

**REMEMBER:** AFTER WELL IS IGNITED, BURNING HYDROGEN SULFIDE WILL CONVERT TO SULFUR DIOXIDE, WHICH IS ALSO HIGHLY TOXIC. **DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.**



## H2S CONTINGENCY PLAN

### TRAINING REQUIREMENTS

WHEN WORKING IN AN AREA WHERE HYDROGEN SULFIDE GAS (H<sub>2</sub>S) MIGHT BE ENCOUNTERED, DEFINITE TRAINING REQUIREMENTS MUST BE CARRIED OUT. ALL COMPANIES WILL INSURE THAT ALL PERSONNEL AT THE WELL SITE WILL HAVE HAD ADEQUATE TRAINING IN THE FOLLOWING:

1. HAZARDS AND CHARACTERISTICS OF H<sub>2</sub>S.
2. PHYSICAL EFFECTS OF HYDROGEN SULFIDE ON THE HUMAN BODY.
3. TOXICITY OF HYDROGEN SULFIDE AND SULFUR DIOXIDE.
4. H<sub>2</sub>S DETECTION.
5. EMERGENCY RESCUE.
6. RESUSCITATORS.
7. FIRST AID AND ARTIFICIAL RESPIRATION.
8. EFFECTS OF H<sub>2</sub>S ON METALS.
9. LOCATION SAFETY.

### SERVICE COMPANY AND VISITING PERSONNEL

- A. EACH SERVICE COMPANY THAT WILL BE ON THIS WELL WILL BE NOTIFIED IF THE ZONE CONTAINS H<sub>2</sub>S.
- B. EACH SERVICE COMPANY MUST PROVIDE FOR THE TRAINING AND EQUIPMENT OF THEIR EMPLOYEES BEFORE THEY ARRIVE AT THE WELL SITE.
- C. EACH SERVICE COMPANY WILL BE EXPECTED TO ATTEND A WELL SITE BRIEFING.

## H2S CONTINGENCY PLAN

### **EMERGENCY EQUIPMENT REQUIREMENTS**

#### 1. **SIGNS**

- A. ONE SIGN LOCATED AT LOCATION ENTRANCE WITH THE FOLLOWING LANGUAGE:

**(LEASE)**  
**CAUTION – POTENTIAL POISON GAS**  
**HYDROGEN SULFIDE**  
**NO ADMITTANCE WITHOUT AUTHORIZATION**

#### 2. **WIND SOCK – WIND STREAMERS**

- A. ONE 36" (IN LENGTH) WIND SOCK LOCATED AT PROTECTION CENTER, AT HEIGHT VISIBLE FROM RIG FLOOR.  
B. ONE 36" (IN LENGTH) WIND SOCK LOCATED AT HEIGHT VISIBLE FROM PIT AREAS.

#### 3. **HYDROGEN SULFIDE DETECTOR AND ALARMS**

- A. H2S MONITORS WITH ALARMS WILL BE LOCATED ON THE RIG FLOOR, AT THE BELL NIPPLE, AND AT THE FLOW LINE. THESE MONITORS WILL BE SET TO ALARM AT 10 PPM WITH RED LIGHT, AND TO ALARM AT 15 PPM WITH RED LIGHT AND AUDIBLE ALARM.  
B. HAND OPERATED DETECTORS WITH TUBES.  
C. H2S MONITOR TESTER.

#### 4. **CONDITION FLAGS**

- A. ONE EACH OF GREEN, YELLOW, AND RED CONDITION FLAGS TO BE DISPLAYED TO DENOTE CONDITIONS.

**GREEN – NORMAL CONDITIONS**  
**YELLOW – POTENTIAL DANGER**  
**RED – DANGER, H2S PRESENT**

- B. CONDITION FLAG SHALL BE POSTED AT LOCATION SIGN ENTRANCE.

## H2S CONTINGENCY PLAN

### **EMERGENCY EQUIPMENT REQUIREMENTS**

#### 5. **AUXILIARY RESCUE EQUIPMENT**

- A. STRETCHER
- B. 100' LENGTH OF 5/8" NYLON ROPE.

#### 6. MUD INSPECTION DEVICES

GARRETT GAS TRAIN OR HACH TESTER FOR INSPECTION OF SULFIDE CONCENTRATION IN MUD SYSTEM.

#### 7. FIRE EXTINGUISHER

ADEQUATE FIRE EXTINGUISHERS SHALL BE LOCATED AT STRATEGIC LOCATIONS.

#### 8. BLOW OUT PREVENTION EQUIPMENT

THE WELL SHALL HAVE HYDRAULIC BOP EQUIPMENT FOR THE ANTICIPATED BHP OF 1500 PSI. EQUIPMENT IS TO BE TESTED ON INSTALLATION.

#### 9. COMBUSTIBLE GAS DETECTOR

THERE SHALL BE ONE COMBUSTIBLE GAS DETECTOR ON LOCATION AT ALL TIMES.

#### 10. BOP TESTING

BOP AND CHOKE LINE AND KILL LINE WILL BE TESTED.

#### 11. AUDIO SYSTEM

RADIO COMMUNICATION WILL BE AVAILABLE AT THE RIG.

- A. RIG FLOOR OR TRAILER
- B. VEHICLE

#### 12. SPECIAL CONTROL EQUIPMENT

- A. HYDRAULIC BOP EQUIPMENT WITH REMOTE CONTROL ON GROUND.
- B. ROTATING HEAD

## H2S CONTINGENCY PLAN

### **EMERGENCY EQUIPMENT REQUIREMENTS**

#### 13. EVACUATION PLAN

EVACUATION ROUTES SHOULD BE ESTABLISHED PRIOR TO SPUDDING EACH WELL AND DISCUSSED WITH ALL RIG PERSONNEL.

#### 14. DESIGNATED AREA

- A. PARKING AND VISITOR AREA: ALL VEHICLES ARE TO BE PARKED AT A PREDETERMINED SAFE DISTANCE FROM THE WELLHEAD. THIS WILL BE THE DESIGNATED SMOKING AREA.
- B. TWO BRIEFING AREAS ON EITHER SIDE OF THE LOCATION AT THE MAXIMUM ALLOWABLE DISTANCE FROM THE WELL BORE SO THEY OFFSET PREVAILING WINDS PERPENDICULARLY, OR AT A 45-DEGREE ANGLE IF WIND DIRECTION TENDS TO SHIFT IN THE AREA.
- C. PROTECTION CENTERS OR IF A MOVABLE TRAILER IS USED, IT SHOULD BE DEPT UPWIND OF EXISTING WINDS. WHEN WIND IS FROM THE PREVAILING DIRECTIONS, BOTH PROTECTION CENTERS SHOULD BE ACCESSIBLE.

## H2S CONTINGENCY PLAN

### STATUS CHECK LIST

NOTE: ALL ITEMS ON THIS LIST MUST BE COMPLETED BEFORE DRILLING TO 2,000'.

1. SIGN AT LOCATION ENTRANCE.
2. TWO (2) WIND SOCKS LOCATED AS REQUIRED.
3. TWO (2) 30-MINUTE PRESSURE DEMAND AIR PACKS ON LOCATION FOR ALL RIG PERSONNEL AND MUD LOGGERS.
4. AIR PACK INSPECTED FOR READY USE.
5. CASCADE SYSTEM AND HOSE LINE HOOK-UP.
6. CASCADE SYSTEM FOR REFILLING AIR BOTTLES.
7. SAFE BREATHING AREAS SET UP.
8. CONDITION FLAG ON LOCATION AND READY FOR USE.
9. H2S DETECTION SYSTEM HOOKED UP.
10. H2S ALARM SYSTEM HOOKED UP AND READY.
11. OXYGEN RESUSCITATOR ON LOCATION AND TESTED FOR USE.
12. STRETCHER ON LOCATION AT SAFETY TRAILER.
13. 1 – 100' LENGTH OF NYLON ROPE ON LOCATION.
14. ALL RIG CREW AND SUPERVISORS TRAINED AS REQUIRED.
15. ALL OUTSIDE SERVICE CONTRACTORS ADVISED OF POTENTIAL H2S HAZARD ON WELL.
16. NO SMOKING SIGN POSTED.
17. HAND OPERATED H2S DETECTOR WITH TUBES ON LOCATION.

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## H2S CONTINGENCY PLAN

### **PROCEDURAL CHECK LIST**

#### **PERFORM EACH TOUR:**

1. CHECK FIRE EXTINGUISHERS TO SEE THAT THEY HAVE THE PROPER CHARGE.
2. CHECK BREATHING EQUIPMENT TO ENSURE THAT IT HAS NOT BEEN TAMPERED WITH.
3. MAKE SURE ALL THE H2S DETECTION SYSTEM IS OPERATIVE.

#### **PERFORM EACH WEEK:**

1. CHECK EACH PIECE OF BREATHING EQUIPMENT TO MAKE SURE THAT DEMAND REGULATOR IS WORKING. THIS REQUIRES THAT THE BOTTLE BE OPENED AND THE MASK ASSEMBLY BE PUT ON TIGHT ENOUGH SO THAT WHEN YOU INHALE, YOU RECEIVE AIR.
2. BLOW OUT PREVENTER SKILLS.
3. CHECK SUPPLY PRESSURE ON BOP ACCUMULATOR STAND BY SOURCE.
4. CHECK ALL SKA-PAC UNITS FOR OPERATION: DEMAND REGULATOR, ESCAPE BOTTLE AIR VOLUMES, SUPPLY BOTTLE OF AIR VOLUME.
5. CHECK BREATHING EQUIPMENT MASK ASSEMBLY TO SEE THAT STRAPS ARE LOOSENED AND TURNED BACK, READY TO PUT ON.
6. CHECK PRESSURE ON BREATHING EQUIPMENT AIR BOTTLES TO MAKE SURE THEY ARE CHARGED TO FULL VOLUME.
7. CONFIRM PRESSURE ON ALL SUPPLY AIR BOTTLES.
8. PERFORM BREATHING EQUIPMENT DRILLS WITH ON-SITE PERSONNEL.
9. CHECK THE FOLLOWING SUPPLIES FOR AVAILABILITY.
  - A. EMERGENCY TELEPHONE LIST.
  - B. HAND OPERATED H2S DETECTORS AND TUBES.

## H2S CONTINGENCY PLAN

### **GENERAL EVACUATION PLAN**

THE DIRECT LINES OF ACTION PREPARED BY **INDIAN FIRE & SAFETY, INC.** TO PROTECT THE PUBLIC FROM HAZARDOUS GAS SITUATIONS ARE AS FOLLOWS:

1. WHEN THE COMPANY APPROVED SUPERVISOR (DRILLING FOREMAN, CONSULTANT, RIG PUSHER, OR DRILLER) DETERMINES THE H2S GAS CANNOT BE LIMITED TO THE WELL LOCATION AND THE PUBLIC WILL BE INVOLVED, HE WILL ACTIVATE THE EVACUATION PLAN. ESCAPE ROUTES ARE NOTED ON AREA MAP.
2. "COMPANY MAN" OR DESIGNEE WILL NOTIFY LOCAL GOVERNMENT AGENCY THAT A HAZARDOUS CONDITION EXISTS AND EVACUATION NEEDS TO BE IMPLEMENTED.
3. COMPANY SAFETY PERSONNEL THAT HAVE BEEN TRAINED IN THE USE OF H2S DETECTION EQUIPMENT AND SELF-CONTAINED BREATHING EQUIPMENT WILL MONITOR H2S CONCENTRATIONS, WIND DIRECTIONS, AND AREA OF EXPOSURE. THEY WILL DELINEATE THE OUTER PERIMETER OF THE HAZARDOUS GAS AREA. EXTENSION TO THE EVACUATION AREA WILL BE DETERMINED FROM INFORMATION GATHERED.
4. LAW ENFORCEMENT PERSONNEL (STATE POLICE, POLICE DEPT., FIRE DEPT., AND SHERIFF'S DEPT.) WILL BE CALLED TO AID IN SETTING UP AND MAINTAINING ROAD BLOCKS. ALSO, THEY WILL AID IN EVACUATION OF THE PUBLIC IF NECESSARY.

**IMPORTANT: LAW ENFORCEMENT PERSONNEL WILL NOT BE ASKED TO COME INTO A CONTAMINATED AREA. THEIR ASSISTANCE WILL BE LIMITED TO UNCONTAMINATED AREAS. CONSTANT RADIO CONTACT WILL BE MAINTAINED WITH THEM.**

5. AFTER THE DISCHARGE OF GAS HAS BEEN CONTROLLED, COMPANY SAFETY PERSONNEL WILL DETERMINE WHEN THE AREA IS SAFE FOR RE-ENTRY.

## H2S CONTINGENCY PLAN

### **EMERGENCY ACTIONS**

#### **WELL BLOWOUT – IF EMERGENCY**

1. EVACUATE ALL PERSONNEL IF POSSIBLE.
2. IF SOUR GAS – EVACUATE RIG PERSONNEL.
3. IF SOUR GAS – EVACUATE PUBLIC WITHIN 1 HOUR RADIUS OF EXPOSURE.
4. DON SCBA AND RESCUE.
5. CALL 911 FOR EMERGENCY HELP (FIRE DEPT AND AMBULANCE) AND NOTIFY SR. DRILLING FOREMAN AND DISTRICT FOREMAN.
6. GIVE FIRST AID.

#### **PERSON DOWN LOCATION/FACILITY**

1. IF IMMEDIATELY POSSIBLE, CONTACT 911. GIVE LOCATION AND WAIT FOR CONFIRMATION.
2. DON SCBA AND RESCUE.



# EMERGENCY PHONE LIST

## GOVERNMENTAL AGENCIES

Eddy County Sheriff's Office 911

Non emergency ..... 505-746-9888

Fire Departments 911

Artesia - Non-emergency ..... 505-746-5050

Atoka – Non-emergency..... 505-746-5050

Carlsbad – Non-emergency..... 505-885-2111

BLM

Carlsbad ..... 505-361-2822

State Police Department 911

Non-emergency ..... 505-437-1313

City of Carlsbad

..... 505-885-2111

Ambulance 911

Artesia – Non Emergency..... 505-746-5050

Atoka – Non-Emergency..... 505-746-5050

Carlsbad – Non Emergency..... 505-885-2111

Hospitals

Artesia ..... 505-748-3333

AEROCARE ..... 806-747-8923

## **Emergency Contact List**

### **Edge Petroleum**

Office 713-650-8960

Fax 713-650-6493

		<b>Office</b>	<b>Cell</b>
Daniel Hurd	Drilling Engineer	281-814-7084	281-814-7084
Kurt Primeaux	Operations Manager	713-427-8805	281-813-8384
Jim Keisling	Operations V.P.	713-427-8883	713-898-2511
John Tugwell	Chief Operating Off.	713-427-8803	713-898-7233

### **Grey Wolf Rig #33**

432-631-5641

Grey Wolf - Houston  
Phillip Chaney

Office 713-435-6100  
Superintendent

Fax 713-435-6170  
432-631-2097

Grey Wolf – Midland  
Freddie Rios

Office 432-684-6828  
Superintendent  
Direct Line  
Rig #33

432-631-0273  
432-687-8106  
432-631-6716

Bo Clark

Mike Amos/William Henderson

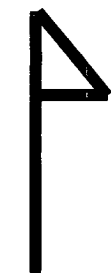
Rig Foreman  
Constultant

**Indian Fire & Safety, Inc.**  
**3317 W. County Road**  
**505-393-3093 - office**  
**800-530-8693 – toll free**  
**505-392-6274 – fax**

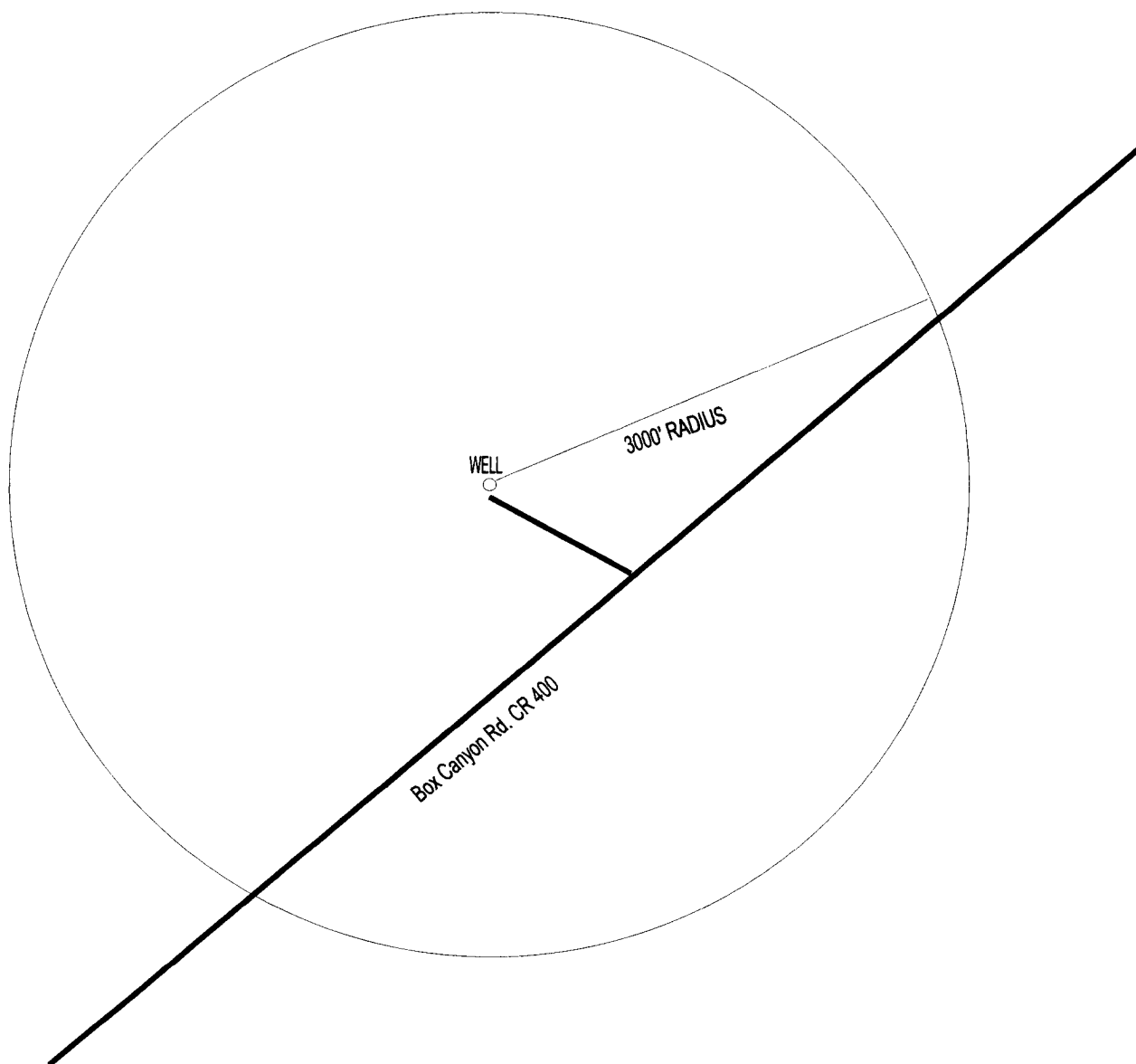
**Personnel Contact List**

	<b>Truck Phone</b>	<b>Cell Phone</b>	<b>Home Phone</b>
James Spurgeon		390-8582	492-9354
Scott Dudenhoeffer	631-9752	631-9753	392-4833
Steve Henry	631-9715	631-9704	393-8688
Sam Abney	631-9754	631-9712	393-5427
Curtis Newton		631-1255	393-3762
Chris Spurgeon		806-215-1087	806-592-0079

**Edge Petroleum Operating Co. Inc.  
Box Canyon 13 Federal  
Sec. 13 T21S R21E  
Eddy County, NM**



**N**



PPM  
1,000,000  
500,000  
300,000  
200,000  
100,000  
80,000  
50,000  
40,000  
30,000  
20,000  
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800  
600  
500  
400  
300  
200  
100  
80  
60  
50  
40  
30  
20  
10

%  
100  
10  
0.1  
0.01

# HYDROGEN SULFIDE 100 PPM EXPOSURE RADIUS

Feet  
100,000  
50,000  
40,000  
30,000  
20,000  
10,000  
8,000  
6,000  
5,000  
4,000  
3,000  
2,000  
1,000  
800  
600  
500  
400  
300  
200  
100  
80  
60  
50  
40  
30  
20  
10  
8  
6  
5  
4  
3  
2  
1

Q, M<sup>2</sup>cf/d  
1000  
900  
800  
700  
600  
500  
400  
300  
200  
100  
90  
80  
70  
60  
50  
40  
30  
20  
10  
8  
6  
5  
4  
3  
2  
1  
0.9  
0.8  
0.7  
0.6  
0.5  
0.4  
0.3  
0.2  
0.1  
0.08  
0.06  
0.05  
0.04  
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0.02  
0.01

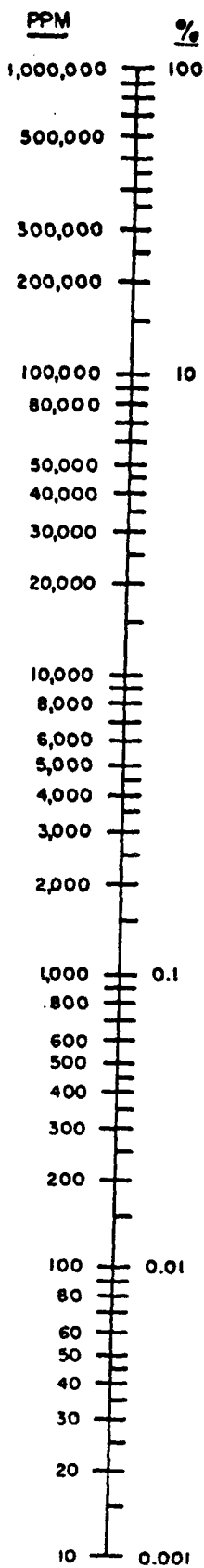
At X = 3000 Ft.  
Q = 226,547 PPM

At X = 50 Ft.  
Q = 326.4 PPM

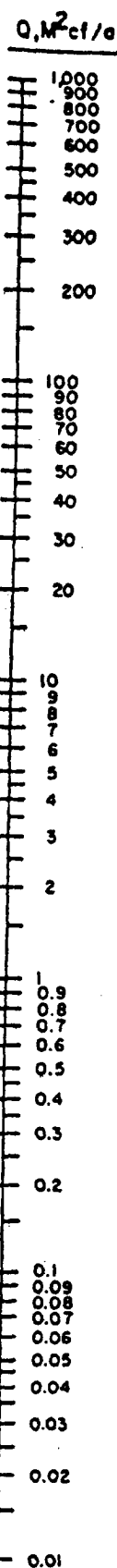
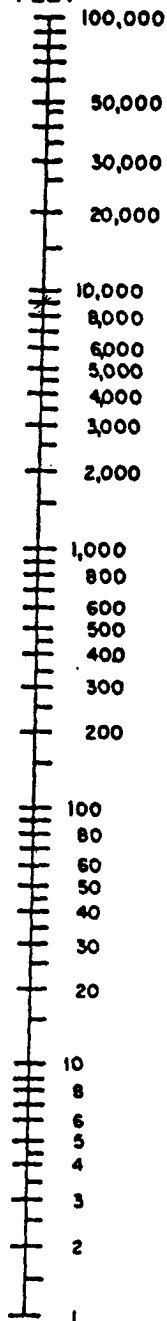
Below 100 PPM  
Rule 36 N.A.

$$\begin{aligned} 100 \text{ PPM Radius of Exposure in Feet} &= X \\ X &= [(1.589)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258} \\ &= [(1.589)(\text{PPM})(Q \text{ in M}^2\text{cf/d})]^{0.6258} \end{aligned}$$

P<sub>b</sub> 14.65 psia T 60 °F



# HYDROGEN SULFIDE 500 PPM EXPOSURE RADIUS FEET



At  $X = 50 \text{ Ft.}$   
 $Q = 1140.9$   
PPM

500 PPM Radius of Exposure in Feet =  $X$   
 $X = [(0.4546)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258}$   
 $X = [(0.4546)(\text{PPM} \div 10^6)(Q \times 10^6 \text{ cu. ft.})]^{0.6258}$   
 Wind velocity = 1 mph; Plume is shape of  $H_2S$  dispersion.  
 Pressure base 14.65 psia,  $T_b = 60^\circ F$

## H2S CONTINGENCY PLAN

### TOXIC EFFECTS OF HYDROGEN SULFIDE

HYDROGEN SULFIDE IS EXTREMELY TOXIC. THE ACCEPTABLE CEILING CONCENTRATION FOR EIGHT-HOUR EXPOSURE IS 10 PPM, WHICH IS .001% BY VOLUME. HYDROGEN SULFIDE IS HEAVIER THAN AIR (SPECIFIC GRAVITY – 1.192) AND COLORLESS. IT FORMS AN EXPLOSIVE MIXTURE WITH AIR BETWEEN 4.3 AND 46.0 PERCENT BY VOLUME. HYDROGEN SULFIDE IS ALMOST AS TOXIC AS HYDROGEN CYANIDE AND IS BETWEEN FIVE AND SIX TIMES MORE TOXIC THAN CARBON MONOXIDE. TOXICITY DATA FOR HYDROGEN SULFIDE AND VARIOUS OTHER GASES ARE COMPARED IN TABLE I. PHYSICAL EFFECTS AT VARIOUS HYDROGEN SULFIDE EXPOSURE LEVELS ARE SHOWN IN TABLE II.

TABLE I  
TOXICITY OF VARIOUS GASES

COMMON NAME	CHEMICAL FORMULA	SPECIFIC GRAVITY (SC=1)	THRESHOLD LIMIT (1)	HAZARDOUS LIMIT (2)	LETHAL CONCENTRATION (3)
HYDROGEN CYANIDE	HCN	0.94	10 PPM	150 PPM/HR	300 PPM
HYDROGEN SULFIDE	H2S	1.18	10 PPM	250 PPM/HR	600 PPM
SULFUR DIOXIDE	SO2	2.21	5 PPM	-	1000 PPM
CHLORINE	CL2	2.45	1 PPM	4 PPM/HR	1000 PPM
CARBON MONOXIDE	CO	0.97	50 PPM	400 PPM/HR	1000 PPM
CARBON DIOXIDE	CO2	1.52	5000 PPM	5%	10%
METHANE	CH4	0.55	90,000 PPM	COMBUSTIBLE ABOVE 5% IN AIR	

- 1) THRESHOLD LIMIT – CONCENTRATION AT WHICH IT IS BELIEVED THAT ALL WORKERS MAY BE REPEATEDLY EXPOSED DAY AFTER DAY WITHOUT ADVERSE EFFECTS.
- 2) HAZARDOUS LIMIT – CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT-TERM EXPOSURE.
- 3) LETHAL CONCENTRATION – CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT-TERM EXPOSURE.

## H2S CONTINGENCY PLAN

### TOXIC EFFECTS OF HYDROGEN SULFIDE

TABLE II  
PHYSICAL EFFECTS OF HYDROGEN SULFIDE

<u>PERCENT (%)</u>	<u>PPM</u>	<u>CONCENTRATION</u> <u>GRAINS</u> <u>100 STD. FT3*</u>	<u>PHYSICAL EFFECTS</u>
0.001	10	00.65	Obvious and unpleasant odor.
0.002	20	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 – 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; Stings eyes and throat.
0.050	500	32.96	Dizziness; Breathing ceases in a few minutes; Needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; Death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; Followed by death within minutes.

\*AT 15.00 PSIA AND 60°F.



## H2S CONTINGENCY PLAN

### **USE OF SELF-CONTAINED BREATHING EQUIPMENT**

1. WRITTEN PROCEDURES SHALL BE PREPARED COVERING SAFE USE OF SCBA'S IN DANGEROUS ATMOSPHERE, WHICH MIGHT BE ENCOUNTERED IN NORMAL OPERATIONS OR IN EMERGENCIES. PERSONNEL SHALL BE FAMILIAR WITH THESE PROCEDURES AND THE AVAILABLE SCBA.
2. SCBA'S SHALL BE INSPECTED FREQUENTLY AT RANDOM TO INSURE THAT THEY ARE PROPERLY USED, CLEANED, AND MAINTAINED.
3. ANYONE WHO MAY USE THE SCBA'S SHALL BE TRAINED IN HOW TO INSURE PROPER FACE-PIECE TO FACE SEAL. THEY SHALL WEAR SCBA'S IN NORMAL AIR AND THEN WEAR THEM IN A TEST ATMOSPHERE. (NOTE: SUCH ITEMS AS FACIAL HAIR {BEARD OR SIDEBURNS} AND EYEGLASSES WILL NOT ALLOW PROPER SEAL.) ANYONE THAT MAY BE REASONABLY EXPECTED TO WEAR SCBA'S SHOULD HAVE THESE ITEMS REMOVED BEFORE ENTERING A TOXIC ATMOSPHERE. A SPECIAL MASK MUST BE OBTAINED FOR ANYONE WHO MUST WEAR EYEGLASSES OR CONTACT LENSES.
4. MAINTENANCE AND CARE OF SCBA'S:
  - A. A PROGRAM FOR MAINTENANCE AND CARE OF SCBA'S SHALL INCLUDE THE FOLLOWING:
    1. INSPECTION FOR DEFECTS, INCLUDING LEAK CHECKS.
    2. CLEANING AND DISINFECTING.
    3. REPAIR.
    4. STORAGE.
  - B. INSPECTION; SELF-CONTAINED BREATHING APPARATUS FOR EMERGENCY USE SHALL BE INSPECTED MONTHLY FOR THE FOLLOWING PERMANENT RECORDS KEPT OF THESE INSPECTIONS.
    1. FULLY CHARGED CYLINDERS.
    2. REGULATOR AND WARNING DEVICE OPERATION.
    3. CONDITION OF FACE PIECE AND CONNECTIONS.
    4. ELASTOMER OR RUBBER PARTS SHALL BE STRETCHED OR MASSAGED TO KEEP THEM PLIABLE AND PREVENT DETERIORATION.
  - C. ROUTINELY USED SCBA'S SHALL BE COLLECTED, CLEANED AND DISINFECTED AS FREQUENTLY AS NECESSARY TO INSURE PROPER PROTECTION IS PROVIDED.

## H2S CONTINGENCY PLAN

### **USE OF SELF-CONTAINED BREATHING EQUIPMENT**

5. PERSONS ASSIGNED TASKS THAT REQUIRES USE OF SELF-CONTAINED BREATHING EQUIPMENT SHALL BE CERTIFIED PHYSICALLY FIT FOR BREATHING EQUIPMENT USAGE BY THE LOCAL COMPANY PHYSICIAN AT LEAST ANNUALLY.
6. SCBA'S SHOULD BE WORN WHEN:
  - A. ANY EMPLOYEE WORKS NEAR THE TOP OR ON TOP OF ANY TANK UNLESS TEST REVEALS LESS THAN 10 PPM OF H2S.
  - B. WHEN BREAKING OUT ANY LINE WHERE H2S CAN REASONABLY BE EXPECTED.
  - C. WHEN SAMPLING AIR IN AREAS TO DETERMINE IF TOXIC CONCENTRATIONS OF H2S EXISTS.
  - D. WHEN WORKING IN AREAS WHERE OVER 10 PPM H2S HAS BEEN DETECTED.
  - E. AT ANY TIME THERE IS A DOUBT AS TO THE H2S LEVEL IN THE AREA TO BE ENTERED.

## H2S CONTINGENCY PLAN

### RESCUE FIRST AID FOR H2S POISONING

#### DO NOT PANIC!

REMAIN CALM – THINK!

1. HOLD YOUR BREATH. (DO NOT INHALE FIRST; STOP BREATHING.)
2. PUT ON BREATHING APPARATUS.
3. REMOVE VICTIM(S) TO FRESH AIR AS QUICKLY AS POSSIBLE. (GO UP-WIND FROM SOURCE OR AT RIGHT ANGLE TO THE WIND. NOT DOWN WIND.)
4. BRIEFLY APPLY CHEST PRESSURE – ARM LIFT METHOD OF ARTIFICIAL RESPIRATION TO CLEAN THE VICTIM'S LUNGS AND TO AVOID INHALING ANY TOXIC GAS DIRECTLY FROM THE VICTIM'S LUNGS.
5. PROVIDE FOR PROMPT TRANSPORTATION TO THE HOSPITAL, AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
6. HOSPITAL(S) OR MEDICAL FACILITIES NEED TO BE INFORMED, BEFORE-HAND, OF THE POSSIBILITY OF H2S GAS POISONING – NO MATTER HOW REMOTE THE POSSIBILITY IS.
7. NOTIFY EMERGENCY ROOM PERSONNEL THAT THE VICTIM(S) HAS BEEN EXPOSED TO H2S GAS.

BESIDES BASIC FIRST AID, EVERYONE ON LOCATION SHOULD HAVE A GOOD WORKING KNOWLEDGE OF ARTIFICIAL RESPIRATION, AS WELL AS FIRST AID FOR EYES AND SKIN CONTACT WITH LIQUID H2S. EVERYONE NEEDS TO MASTER THESE NECESSARY SKILLS.