XTO ENERGY

H2S Contingency Plan

30-045-34155

Ute Indians A# 57

New Mexico Drilling Operations

San Juan Division

H2S Contingency Plan
(Emergency Response and Public Protection Plan)

XTO Energy Inc.

Ute Indians A#57
San Juan Basin Operations

PREPARED BY:
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H2S Contingency Plan

Company Name:	**XTO Energy, Inc.** A subsidiary of **ExxonMobil**
Address:	Rd. 382 County Road 3100 Aztec, New Mexico 87410
Phone:	(505) 333-3100
Well Name:	Ute Indians A#57
Legals at Surface:	870' FSL – 1710' FWL / Sec. 27-32N-R14W
BIA Number:	142060462
County:	San Juan
State:	New Mexico
TD:	Varied Geological Depths (Paradox)
Location:	New Mexico, San Juan Basin Operations
Field Name:	San Juan Basin New Mexico Barker Dome
H2S Formation and Depth:	To be determined by drilling data and geological history

CONTENTS

1.00 PURPOSE

This Emergency Response, and Public Protection Plan (Plan), is a master specific plan, that applies to the San Juan Basin Operations, of New Mexico, operated by XTO Energy Inc. (XTO). This document is designed to provide for the safety and welfare of XTO and contract personnel, the community, the environment, and property, under H2S situations.

This plan establishes evacuation procedures, assigns response duties to specific individuals, provides for notification of outside agencies, and provides details of actions to alert and protect the public. This Plan will be activated immediately upon the detection of the release of a potentially hazardous volume of hydrogen sulfide (H2S).

2.00 GENERAL INFORMATION ON AND PHYSIOLOGICAL RESPONSES TO HYDROGEN SULFIDE (H2S) AND SULFUR DIOXIDE (SO2).

2.10 HYDROGEN SULFIDE (H2S)

Hydrogen sulfide is a flammable, highly toxic, colorless gas that is heavier than air, with the odor of rotten eggs. It can be detected by smell at the concentration of only 0.002 parts per million (ppm). Above concentrations of 100 ppm, it will deaden the sense of smell in a few minutes, and at a concentration of 600 + ppm, a single breath can be fatal. If ignited, it burns with a blue flame. In still air, it tends to accumulate in low places in dangerous concentrations. However, if it is warmer than the surrounding air, it may tend to rise. The upper flammability in air is 4% (40,000 ppm).

Breathing low concentrations of H2S can cause headaches. Higher concentrations (0.01 percent by volume) cause irritation of the eyes, nose, throat, and lungs. Eyes become red and swollen, accompanied by sharp pain in more severe cases. Still higher concentrations (0.05 percent by volume) cause dizziness, unconsciousness, and failure of respiration.

The Threshold Limit Value (TLV) is 10 ppm (0.001%) in air. This is the limit for eight hours of continuous exposure as recommended by the American Conference of Governmental Industrial Hygienists. The health and safety reference values of various concentrations of H2S are listed in the toxicity chart below. A Manufacturers Safety Data Sheet (MSDS) for hydrogen sulfide is included in Appendix D.

2.20 SULFUR DIOXIDE (S02)

Sulfur dioxide is formed with the burning of hydrogen sulfide gas. Sulfur dioxide is a pungent, irritating, suffocating, colorless gas. This gas is normally heavier than air and concentrations above 400 ppm are considered dangerous for even brief exposures.

Under special circumstances, hydrogen sulfide gas may be ignited in order to dissipate a gas cloud and reduce impact on a local area. Often these burning temperatures are enough to raise and mix the SO2 with air in a ratio well below toxic levels. However, great care and proper monitoring should be used when this is attempted.

Due to the irritating effect of SO2 at low concentrations of less than 5 ppm, there is usually no doubt as to it's presence in an area, which provides better warning characteristics than H2S.

2.30 TOXICITY CHART

NAME	SPECIFIC GRAVITY (1)	TLV (2) (ppm)	HAZARDOUS LIMIT (3)	LETHAL CONCENTRATION (4)
Hydrogen Sulfide	1.18	10	100 ppm/1hr.	600 + ppm
Sulfur Dioxide	2.21	2	50 ppm/1 hr.	400 ppm

Notes:

(1) Specific gravity of air = 1.00
(2) TLV – Threshold Limit Value
(3) Hazardous Limit – concentration that may cause death with short term exposure.
(4) Lethal concentration – concentration that may cause death with only a few breaths.

3.00 TREATMENT PROCEDURES FOR H2S AND SO2 EXPOSURE

A. Remove the patient to fresh air. Personnel should always use fresh air breathing equipment when entering an area to retrieve a person who has been overcome with H2S.

B. Call a physician and get patient under his care as soon as possible.

C. If breathing has ceased, begin artificial respiration immediately. Give cardiopulmonary resuscitation (CPR) only if there is no pulse and no breathing. Continue revival efforts until physician arrives or, if patient is mobile and it is determined that he should go to the hospital, continue oxygen inhalation under the physician's direction.

D. Administer oxygen to help eliminate toxic substances from blood stream.

E. Keep the patient at rest and protect from chilling.

4.00 INDIVIDUAL RESPONSIBILITIES

It is the responsibility of *all personnel* on the location to familiarize themselves with the procedures outlined in this contingency plan.

A. All Personnel
   1. Responsible for their assigned safety equipment.
   2. Responsible for familiarizing themselves with the location of all safety equipment.
   3. Responsible for reporting any indications of H2S to those in the area and to a supervisor.

B. Operations Supervisor
   1. Responsible for thoroughly understanding and seeing that all aspects of this contingency plan are enforced.
   2. Responsible for implementing all phases of this contingency plan.
   3. Responsible for keeping a minimum of personnel on the location during expected hazardous operations.
   4. Responsible for coordinating all well site operations and communications in the event that an emergency condition develops.
   5. Responsible for ensuring that all visitors receive an H2S safety orientation. A visitors log will be maintained as well as a list of all personnel on location after drilling has progressed to the suspected H2S formation.

4.10 LOCATION LAYOUT

The location should have at least two pre-determined safe areas to assemble at in the event of an emergency. These locations should be located 180 degrees to one another, and in the direction of the prevailing winds.

A. H2S rig monitor with at least three heads. One located at the bell nipple, one located at the shale shaker, and a third one on the rig floor.
The location and type of all air masks. Self-contained breathing apparatus for use by rig personnel for this well will be kept in the following location(s):

Type: 1-30 min. rescue unit	**Location: Safety Contractor's Trailer**
Type: 1-30 min. rescue unit	**Location: All Trailers**
Type: 2-30 min. rescue unit	**Location: Briefing Area #1**
Type: 2-30 min. rescue unit	**Location: Briefing Area #2**
Type: 5-Hoseline work unit	**Location: Safety Trailer**
Type: 3-5 min escape unit	**Location: Rig Floor**
Type: 1-5 min. escape unit	**Location: Tubing board (derrick)**

If a cascade system is utilized, indicate the location(s);

Type: 10 cylinder cascade	**Location: Safety Trailer located by rig base of catwalk.**

The location of windsocks or streamers. The wind directions indicators for this well will be located at:

Type: Windsock	**Location: Briefing Area #1**
Type: Windsock	**Location: Briefing Area #2**
Type: Windsock	**Location: On floor & pits**

The location of any other safety equipment used, such as flare guns or bug blowers.

Type: Flare gun	**Location: Safety Trailer**

The location of all telephones and/or means of communications are as follows:

Type: Cell phone	**Location: Drilling Superintendent** **Tool Pusher**

Warning Signs:
"No Smoking" signs should be strategically located around the rig and rig location. The following locations are appropriate:

Rig Floor
Dog house
Substructure
Lower landing of all stairs to rig floor
Mud pits
Shale shaker

"Poison Gas" signs should also be strategically located around the rig and rig location.

The following locations are appropriate:

All entrances leading to location
Lower landing of all stairs leading to rig floor
All areas around substructure, including mud pits and shale shaker
Various points along the perimeter of the radius of exposure

NOTE: ***All warnings should be black and yellow in color and of readable size at a distance.***

4.20 OPERATING PROCEDURES

The following operating procedures will be utilized for drilling in areas with H2S.

A. Plan of operation for handling gas kicks and other problems. Any gas kick will be controlled by using approved well control techniques. Upon evidence that ambient H2S concentrations have reached 10 ppm, all non-essential personnel will be evacuated to pre-determined safe areas. Personnel remaining on the rig floor will continue to control the well until the situation indicates the area is safe to re-enter.

Special Operations:
Drill Stem Tests: **All drill stem tests must be closed chamber and conducted during daylight hours only.**
Coring: **After a core has been cut, circulate bottoms up and monitor for H2S. If hole conditions (and/or detectors) indicate potentially hazardous conditions, put breathing equipment on (10) ten stands before core barrel reaches surface. Breathing equipment will be worn by all personnel while core barrel is pulled, broken out and opened, and until a safe atmosphere is indicated.**
All equipment with potential for H2S shall be suitable for H2S service, i.e. Drill String, Casing, Well Head, Blowout Preventor equipment and trim, Rotating Head, Kill Lines, Choke Manifold and Lines.
A remote controlled choke will be installed prior to all H2S drilling.
Mud system pH will be maintained at or above 10.0 with sufficient materials on location to maintain the required pH.
A flare pit **will be located a minimum of 150" from the wellhead and 30" from the reserve pit. Should H2S be encountered during drilling operations an** ***ignitable flaring system*** **will be used and burnable gas will then be vented to the atmosphere. Extreme caution will be noted for Sulfur Dioxide that is a by product of Hydrogen Sulfide when burned.**

4.30 OPERATING CONDITIONS

Operating conditions are defined in three categories. A description of each of these conditions and the required action to take are given below.

A. Condition I – Normal Operating Conditions, Potential Danger
Characterized by: Normal Drilling Operations in zones which contain or may contain H2S.
Warning Flag: Yellow
Alarm: None
Probable Occurrence: No detectable gas present at surface
General Action:
Know location of safety equipment.
Check safety equipment for proper function. Keep it available.
Be alert for a condition change.
Follow instructions of supervisor.

B. Condition II – Potential to Moderate Danger to Life

Characterized by: H2S gas present. Concentration less than 10 ppm.

Warning Flag:	Orange
Alarm:	Flashing light at 10 ppm H2S. Intermittent blasts on horn at 10 ppm H2S.
Probable Occurrence:	As drill gas.
	As trip gas when circulating bottoms up
	When a core barrel is pulled
	When a well kick is circulated out
	Surface pressure, well flow or lost operations
	Equipment failure during testing operations

General Action:
Follow instructions of supervisor.
Put on breathing equipment if directed, or is conditions warrant it.
Stay in "SAFE BRIEFING AREA" if instructed and not working to correct the problem.
The Drilling Superintendent will initiate action to reduce the H2S concentration to zero.

C. Condition III – Moderate to Extreme Danger to Life

Characterized by: H2S present in concentrations at or above 10 ppm. Critical well operations or well control problems. In the extreme, loss of well control.

Warning Flag:	Red
Alarm:	Flashing light and continuous blast on horn at 10 ppm H2S
Probable Occurrence:	As drill gas
	As trip gas when circulating bottoms up
	When a core barrel is pulled
	When a well kick is circulated out
	Surface pressure, well flow or lost return problems
	Equipment failure during testing operations

General Action:
Put on breathing equipment. Move to "SAFE BRIEFING AREA" and remain there is not working to correct or control problem.
Follow instructions of Drilling Superintendent or other supervisor.
The Drilling Superintendent will initiate emergency action as provided in the contingency plan and as appropriate to the actual conditions. If testing operations are in progress, the well will be shut in. The Drilling Superintendent will conduct any necessary operations with an absolute minimum of personnel. All persons in the immediate area will wear a breathing apparatus. All other personnel will restrict their movements to those directed by the Superintendent.
If gas containing hydrogen sulfide (H2S) is ignited, the burning hydrogen sulfide will be converted to sulfur dioxide, which is poisonous.

5.00 HYDROGEN SULFIDE EMERGENCY PROCEDURES

The procedures listed below apply to drilling and testing operations:

A. If at any time during Condition I, the mud logger, mud engineer, or any other person detects H2S, he will notify the Drilling Superintendent. All personnel should keep alert to the Drilling Superintendent's orders. He will:

1. Immediately begin to ascertain the cause or the source of the H2S and take steps to reduce the H2S concentration to zero. This should include having the mud engineer run a sulfide and pH determination on the flowline mud if water-base mud is in use. If an oil-base mud is in use, the mud engineer should check the lime content of the mud.

2. Order non-essential personnel out of the potential danger area.
3. Order all personnel to check their safety equipment to see that it is working properly and in the proper location. Persons without breathing equipment will not be allowed to work in a hazard area.
4. Notify the Contract Supervisor of condition and action taken.
5. Continue gas monitoring activities and continue with caution.
6. Display the orange warning flag.

B. If the H2S concentration exceeds 10 ppm, the following steps will be taken:
1. Put on breathing equipment
2. Display red flag
3. Driller – prepare to shut the well in
   a. Pick up pipe to get Kelly out of BOP's
   b. Close BOP's if necessary
4. If testing operations are in progress, the well will be shut-in
5. Help anyone who may be affected by the gas
6. Evacuate quickly to the "SAFE BRIEFING AREA" if instructed or conditions warrant

C. In the event a potentially hazardous volume of H2S is released into the atmosphere, the following steps must be taken to alert the public:
1. Remove all rig personnel from the danger area and assembly at a pre-determined safe area, preferable upwind from the well site.
2. Alert the drilling office, public safety personnel, regulatory agencies, and the general public of the existence and location of an H2S release. See List of Emergency Telephone Numbers.
3. Assign personnel to block any public road (and access road to location) at the boundary of the area of exposure. Any unauthorized people within the area should be informed that an emergency exists and be ordered to leave immediately.
4. Request assistance from public safety personnel to control traffic and/or evacuate people from the threatened area.

6.00 TRAINING PROGRAM

All personnel associated with the drilling operations will receive training to ensure efficient and correct action in all situations. This training will be in the general areas of:
(A) Personnel Safety (B) Rig Operations (C) Well Control Procedures

A. Personnel Safety Training – All Personnel shall have received H2S training in the following areas:
1. Hazards and characteristics of H2S.
2. Effect on mental components of the system.
3. Safety precautions.
4. Operation of safety equipment and life support systems.
5. Corrective action and shutdown procedures.

B. Rig Operations – All rig personnel shall have received training in the following areas:
1. Well control procedures.
2. Layout and operations of the well control equipment.

NOTE: *Proficiency will be developed through BOP drills which will be documented by the Drilling Superintendent.*

7. Service Company Personnel – All service personnel shall be trained by their employers in the hazards and characteristics of H2S, and the operation of safety equipment, and life support systems.

Visitors – All first time visitors to the location will be required to attend a safety orientation. The Drilling Superintendent shall be responsible for this orientation and he shall see that every visitor is logged correctly.

Public - The public within the area of exposure shall be given an advance briefing by the Drilling Superintendent. This briefing must include the following elements:

1. Hazards and characteristics of hydrogen sulfide. It is an extremely dangerous gas. It is normally detectable by its "rotten egg" odor, but odor is not a reliable means of detections because the sense of smell may be dulled or lost due to intake of the gas. It is colorless, transparent and flammable. It is heavier than air and may accumulate in low places.
2. The necessity of an emergency action plan. Due to the danger of persons exposed to hydrogen sulfide and the need for expeditious action should an emergency occur, this action plan will be put into effect if and when a leak occurs.
3. The location of hydrogen sulfide within the area of exposure at the drilling location.
4. The manner in which the public will be notified of an emergency.
5. Steps to be taken in case of an emergency.
6. Abandon danger area.
7. Notify necessary agencies and request assistance for controlling traffic and evacuating people.

7.00 PROTECTION OF THE GENERAL PUBLIC

7.10 NOTIFICATION OF POTENTIAL DANGER

- Warning signs will be prominently displayed at the well site and at all access points.

7.20 EMERGENCY EVACUATION AND ISOLATION OF DANGER AREA

In the event that toxic gases are released in such quantities as to be a possible hazard to the public, the following steps (in addition to the procedure outlines in Section 5.00) will be taken by the person in charge.

- Choose a command post site in a safe area
- Alert by telephone the Incident Commander or the Safety Manager and notify the person of the situation and your choice of command posts.
- Notify local Law Enforcement Officials of the need to restrict entry to the area and the location of your command post. Request their assistance in restricting entry into the danger area by placing roadblocks or barriers in safe areas.

NOTE: *Alternate command posts and roadblocks may be required; the Incident Commander may make changes in the locations listed above. Care should be taken to notify all responders of the changes.*

- If evacuation cannot be accomplished in a timely manner and the H2S release is posing an immediate threat to human life, the Incident Commander may choose to ignite the gas, Because of the increased risks igniting the gas can pose for response personnel, only the Incident Commander can give this order.

APPENDIX A
AREA MAP

APPENDIX B
LOCATION LAYOUT

APPENDIX C
EMERGENCY CONTACT LIST

EPA 24-Hour Spill Notification Number	**303-293-1788**
Department of Transportation National Response Center	**800-424-8802**
Medical Personnel:	
Ambulance	**911**
Hospitals	
San Juan Regional Medical Center	**505-325-5011**
Lifeguard Air Emergency Services (life flight)	**(911) 505-609-6911**
Firefighting & Public Safety Personnel:	
Fire Department	**505-334-6622**
Police Department	**505-334-6622**
San Juan County Sheriff's office, New Mexico	**505-334-6622**
New Mexico State Patrol	**505-325-7547**
Government Agencies:	
San Juan County-New Mexico Health Department	**505-334-9481**
New Mexico BLM Office	**505-599-8900**
NMOCD	**505-334-6178**
LEPC-Aztec, New Mexico	**505-334-1180**
Colorado BLM	**970-247-4874**
XTO Energy Personnel:	
Brent Martin, Drilling Manager	**505-320-4074**
Bobby Jackson, Drilling Superintendent	**505-486-4706**
Jerry Lacy, Drilling Superintendent	**505-320-6543**
Dennis Elrod, XTO Energy Drilling Foreman	**505-486-6460**
Mark Nietzel, XTO Energy Drilling Foreman	**505-486-2609**
Justin Neiderhofer, Drilling Engineer	**505-320-0158**
Martin Nee, EH&S Division Manager	**505-793-6694**
Jeff Clement, Senior EH&S Coordinator	**505-215-0533**
Service Companies:	
Pump Trucks: TBD	
Dirt Contractor: TBD	
H2S Safety Company: McGuire Industries Inc.	**505-325-6232**
Leroy Winters: H2S Safety Specialist	**505-860-2546**

Emergency calls should dial 911.

NOTE: ***If 911 are unavailable, call the applicable County Sheriff Dispatch number.***

APPENDIX D
H2S RADIUS OF EXPOSURE

APPENDIX E
H2S RADIUS OF EXPOSURE MAP

APPENDIX F
HYDROGEN SULFIDE MSDS

APPENDIX G
EMPLOYEE SIGNOFF SHEET

I have read the XTO Energy Inc. EMERGENCY RESPONSE PLAN/PUBLIC PROTECTION PLAN and understand its contents. I understand my personal responsibilities under this policy and will make use of this information to contribute to safety of the public and for my own personal safety while an employee of XTO Energy Inc.

Signed **Date**