

# HYDROGEN SULFIDE CONTINGENCY PLAN

**Mull Drilling Company, Inc.**

SAT Unit #1-24

SW/4 Section 14-T17S-R45W, 6<sup>th</sup> PM

1251' FSL & 171' FEL

Kiowa County, Colorado

June 25, 2012

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### **SCOPE**

THIS CONTINGENCY PLAN ESTABLISHES GUIDELINES FOR THE PUBLIC AND 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.

## **DISCUSSION**

|                                |   |
|--------------------------------|---|
| IMPLEMENTATION:                | THIS PLAN WITH ALL DETAILS IS TO BE FULLY IMPLEMENTED BEFORE DRILLING TO <u>PRODUCTION 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 TO <u>PRODUCTION CASING POINT</u> . |
| BRIEFING:                      | THIS SECTION DEALS WITH THE BRIEFING OF ALL PEOPLE INVOLVED IN THE DRILLING OPERATION.                                      |
| 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.  |

**EMERGENCY PROCEDURES**

- A. IN THE EVENT OF ANY EVIDENCE OF H<sub>2</sub>S 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 H<sub>2</sub>S 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 DOWNWIND AREA FROM THE RIG - PARTIAL EVACUATION AND ISOLATION. NOTIFY NECESSARY PUBLIC SAFETY PERSONNEL
  - 2. REMOVE ALL PERSONNEL TO SAFE BREATHING AREA.
  - 3. 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 (CONT.)**

\*(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>  |
| 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 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 (CONT.)**

- |   |   |
|---|---|
| DERRICK MAN<br>FLOOR MAN #1<br>FLOOR MAN #2 | 1. WILL REMAIN IN BRIEFING AREA UNTIL<br>INSTRUCTED BY SUPERVISOR.  |
| MUD ENGINEER:<br>(If on location)           | 1. REPORT TO BRIEFING AREA.<br><br>2. WHEN INSTRUCTED, BEGIN CHECK OF MUD<br>FOR PH AND H <sub>2</sub> S LEVEL. |
| SAFETY PERSONNEL:                           | 1. MASK UP AND CHECK STATUS OF ALL<br>PERSONNEL   |

**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 PERSONEL 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.

### **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.

#### **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. IGNITE UP WIND AND DO NOT APPROACH ANY CLOSER THAN IS WARRANTED.
3. SELECT THE IGNITION SITE BEST FOR PROTECTION, AND WHICH OFFERS AN EASY ESCAPE ROUTE.
4. BEFORE FIRING, CHECK FOR PRESENCE OF COMBUSTABLE GAS.
5. AFTER LIGHTING, CONTINUE EMERGENCY ACTION AND PROCEDURE AS BEFORE.
6. 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.



### **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.

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.
10. SCBA TRAINING.

### **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.

## **EMERGENCY EQUIPMENT REQUIREMENTS**

### 1. **SIGNS**

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

**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. H<sub>2</sub>S MONITOR WITH ALARM WILL BE LOCATED ON THE RIG FLOOR. THIS MONITOR 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.

### 4. **CONDITION FLAGS**

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

**GREEN – NORMAL CONDITION  
YELLOW – POTENTIAL DANGER  
RED – DANGER, H<sub>2</sub>S PRESENT**

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

**EMERGENCY EQUIPMENT REQUIREMENTS (CONT.)**

5. **AUXILIARY RESCUE EQUIPMENT**

100' LENGTH OF 5/8" NYLON ROPE.

6. **FIRE EXTINGUISHERS**

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 800 PSI. EQUIPMENT IS TO BE TESTED ON INSTALLATION.

9. **COMBUSTABLE 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. **SPECIAL CONTROL EQUIPMENT**

A. **HYDRAULIC BOP EQUIPMENT WITH CONTROL ON GROUND.**

12. **2 SELF CONTAINED BREATHING APPARATUS (SCBA)**

**EMERGENCY EQUIPMENT REQUIREMENTS (CONT.)**

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 DISANCE 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 KEPT UPWIND OF EXISTING WINDS. WHEN WIND IS FROM THE PREVAILING DIRECTIONS, BOTH PROTECTION CENTERS SHOULD BE ACCESSIBLE.

**STATUS CHECK LIST**

NOTE: ALL ITEMS ON THIS LIST MUST BE COMPLETED BEFORE  
DRILLING TO PRODUCTION CASING POINT.

1. SIGN AT LOCATION ENTRANCE.
2. TWO (2) WIND SOCKS LOCATED AS REQUIRED.
3. TWO (2) 30-MINUTE Positive PRESSURE AIR PACKS ON LOCATION
4. AIR PACK INSPECTED FOR READY USE.
5. SAFE BREATHING AREAS SET UP.
6. CONDITION FLAG ON LOCATION AND READY FOR USE.
7. 1 – 100' LENGTH OF NYLON ROPE ON LOCATION.
8. ALL RIG CREW AND SUPERVISORS TRAINED AS REQUIRED.
9. ALL OUTSIDE SERVICE CONTRACTORS ADVISED OF POTENTIAL H<sub>2</sub>S  
HAZARD OF WELL.
10. NO SMOKING SIGN POSTED.
11. HAND OPERATED H<sub>2</sub>S DETECTOR ON LOCATION.

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

### **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 H<sub>2</sub>S DETECTION SYSTEM IS OPERATIVE.

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

1. BLOW OUT PREVENTER SKILLS.
2. CHECK SUPPLY PRESSURE ON BOP ACCUMLATOR STAND BY SOURCE.
3. CHECK BREATHING EQUIPMENT MASK ASSEMBLY TO SEE THAT STRAPS ARE LOOSENED AND TURNED BACK, READY TO PUT ON.
4. CHECK PRESSURE ON BREATHING EQUIPMENT AIR BOTTLES TO MAKE SURE THEY ARE CHARGED TO FULL VOLUME.
5. PERFORM BREATHING EQUIPMENT DRILLS WITH ON-SITE PERSONNEL.
6. CHECK THE FOLLOWING SUPPLIES FOR AVAILABILITY.
  - A. EMERGENTY TELEPHONE LIST.
  - B. HAND OPERATED H<sub>2</sub>S DETECTORS.

### **GENERAL EVACUATION PLAN**

THE DIRECT LINES OF ACTION 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 H<sub>2</sub>S 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 H<sub>2</sub>S DETECTION EQUIPMENT AND SELF-CONTAINED BREATHING EQUIPMENT WILL MONITOR H<sub>2</sub>S 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 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

## **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 3000 FT 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.



### **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                    | 10PPM               | 150 PPM/HR                  | 300 PPM                  |
| HYDROGEN SULFIDE | H <sub>2</sub> S | 1.18                    | 10 PPM              | 250 PPM/HR                  | 600 PPM                  |
| SULFUR DIOXIDE   | SO <sub>2</sub>  | 2.21                    | 5 PPM               |                             | 1000 PPM                 |
| Chlorine         | CL <sub>2</sub>  | 2.45                    | 1 PPM               | 4 PPM/HR                    | 1000 PPM                 |
| CARBON MONOXIDE  | CO               | 0.97                    | 50 PPM              | 400 PPM/HR                  | 1000 PPM                 |
| CARBON DIOXIDE   | CO <sub>2</sub>  | 1.52                    | 5000 PPM            | 5%                          | 10%                      |
| METHANE          | CH <sub>4</sub>  | 0.55                    | 90,000 PPM          | COMBUSTIBLE ABOVE 5% IN AIR |                          |

- 1) THRESHOLD LIMIT – CONCENTRATION AT WHICH IT IS BELIEVE THAT ALL WORKERS MAY BE REPEATEDLY EXPOSED DAY AFTER DAY WHITHOUT ADVERSE EFFECTS.
- 2) HAZARDOUS LIMIT – CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT – TERM EXPOSURE.
- 3) LETHAL CONCENTRATION – CONCENTRATION THAT WILL CAUSE immediate DEATH WITH SHORT – TERM EXPOSURE

**TOXIC EFFECTS OF HYDROGEN SULFIDE (CONT.)**

TABLE II  
**PHYSICAL EFFECTS OF HYDROGEN SULFIDE**

|      |      |       |  |
|------|------|-------|--|
| 0.01 | 100  | 6.48  | Kill smell in 3-15 minutes. May sting eyes and throat                              |
| 0.02 | 200  | 12.96 | Kills smell shortly; Stings eyes and throat  |
| 0.05 | 500  | 32.96 | Dizziness; Breathing ceases in a few minutes; Needs prompt artificial respiration. |
| 0.07 | 700  | 45.36 | Unconscious quickly; Death will result if not rescued promptly                     |
| 0.1  | 1000 | 64.3  | Unconscious at once; Followed by death within minutes.                             |

\*AT 15.00 PSIA AND 60°F.

**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 OPERATION 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.

**USE OF SELF-CONTAINED BREATHING EQUIPMENT (CONT.)**

5. PERSONS ASSIGNED TASKS THAT REQUIRES USE OF SELF-CONTAINED BREATHING EQUIPMENT SHALL BE CERTIFIED PHYSICALLY FIT FOR BREATHING EQUIPMENT USUAGE 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 H<sub>2</sub>S.
  - B. WHEN BREAKING OUT ANY LINE WHERE H<sub>2</sub>S CAN REASONABLY BE EXPECTED.
  - C. WHEN SAMPLING AIR IN AREAS TO DETERMINE IF TOXIC CONCENTRATIONS OF H<sub>2</sub>S EXIST.
  - D. WHEN WORKING IN AREAS WHERE OVER 10 PPM H<sub>2</sub>S HAS BEEN DETECTED.
  - E. AT ANY TIME THERE IS A DOUBT AS TO THE H<sub>2</sub>S LEVEL IN THE AREA TO BE ENTERED.

**RESCUE**  
**FIRST AID FOR H<sub>2</sub>S 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. Perform CPR if required
5. PROVIDE FOR PROMPT TRANSPORTATION TO THE HOSPITAL, AND CONTINUE GIVING CPR IF NEEDED.
6. HOSPITAL(S) OR MEDICAL FACILITIES NEED TO BE INFORMED, BEFORE-HAND, OF THE POSSIBILITY OF H<sub>2</sub>S GAS POISONING – NO MATTER HOW REMOTE THE POSSIBILITY IS.
7. NOTIFY EMERGENCY ROOM PERSONNEL THAT THE VICTIM(S) HAS BEEN EXPOSED TO H<sub>2</sub>S GAS.

BESIDES BASIC FIRST AID, EVERYONE ON LOCATION SHOULD HAVE A GOOD WORKING KNOWLEDGE OF CPR, AS WELL AS FIRST AID FOR EYES AND SKIN CONTACT WITH LIQUID H<sub>2</sub>S. EVERYONE NEEDS TO MASTER THESE NECESSARY SKILLS.

**EMERGENCY CONTACTS**

**MULL DRILLING COMPANY (OPERATOR) PERSONNEL:**

|              |                    |  |
|--------------|--------------------|--|
| Tracy Akers  | Production Foreman | Office: (719) 767-8805<br>Cell: (719) 342-1813 |
| Bill Stutz   | Production Foreman | Office: (719) 767-8805<br>Cell: (719) 343-5182 |
| Carl Smalley | Environmental      | Office: (719) 767-8805<br>Cell: (719) 342-1812 |
| Mark Shreve  | President/COO      | Office: (316) 264-6366<br>Cell: (316) 734-6769 |

**MULL DRILLING COMPANY (CONTRACTOR) PERSONNEL:**

|              |                         |  |
|--------------|-------------------------|--|
| Greg Condren | Toolpusher              | Cell (620) 544-9338                          |
| Bernie Meyer | Drilling Superintendent | Office (785) 462-7541<br>Cell (785) 443-1016 |

**KIOWA COUNTY, COLORADO:**

|                 |     |
|-----------------|-----|
| All Emergencies | 911 |
|-----------------|-----|

**GOVERNMENT AGENCIES TO BE NOTIFIED IN CASE OF EMERGENCY:**

|  |                |
|--|----------------|
| National Response Center                                       | (800) 424-8802 |
| Bureau of Land Management<br>(Dawson County-Miles City Office) | (406) 233-2800 |

**AREA RESIDENTS**

**Residences within 3,000':** None  
**Names/Number of Residents:** N/A

**Nearest Residence:** ~4,000' NNW  
**Residents:** Burl & Catherine Scherler  
Phone: (719)688-3367

**Livestock within 3,000:** None  
**Location & Approximate #:** N/A