

CONTACTING AUTHORITIES  
FOR EMERGENCY SITUATIONS

H2S Contingency Plan

Marshall and Winston Inc.

**RECEIVED**

APR 15 2011

NMOCD ARTESIA

Agencies will ask for information about the release such as: Type, Volume, Wind Direction, Location, etc. Be prepared with all information available. This response plan must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

| Ambulance            | Ambulance                        | 911                |
|----------------------|----------------------------------|--------------------|
| Marshall and Winston | Otis Holt (Well Site Supervisor) | (325) 206-1528 (c) |
| Marshall and Winston | Gabe Herrera (Engineer)          | (432) 684-6373 (o) |
| "                    | "                                | (432) 260-8650 (c) |
| Marshall and Winston | Tom Brandt (Operations)          | (432) 684-6373 (o) |
| "                    | "                                | (432) 553-9747 (c) |
| Marshall and Winston | George Watters                   | (432) 684-6373 (o) |
| "                    | "                                | (432) 631-2051 (c) |

**Artesia**

|                                      |                |
|--------------------------------------|----------------|
| Ambulance                            | 911            |
| State Police                         | (575) 746-2703 |
| City Police                          | (575) 746-2703 |
| Sheriff's Office                     | (575) 746-9888 |
| Fire Department                      | (575) 746-2701 |
| Local Emergency Planning Committee   | (575) 746-2122 |
| New Mexico Oil Conservation Division | (575) 748-1283 |

**Santa Fe**

|                                                      |                |
|------------------------------------------------------|----------------|
| N.M. Emergency Response Commission (Santa Fe) 24 hrs | (505) 476-9600 |
| NM State Emergency Operations Center                 | (505) 476 9635 |

**National**

|                                              |                |
|----------------------------------------------|----------------|
| National Energy Response Center (Washington) | (800) 424-8802 |
|----------------------------------------------|----------------|

**Medical**

|                                                       |                |
|-------------------------------------------------------|----------------|
| Flight for Life 4000 24 <sup>th</sup> St. Lubbock, TX | (806) 743-9911 |
| Aero care -R3, Box 49F, Lubbock, TX                   | (806) 747-8923 |
| Med Flight Air Amb, 2301 Yale Blvd S.E. Alb., NM      | (505) 842-4433 |
| SB Air Med Service, 2505 Clark Loop S.E., Alb., NM    | (505) 843-4949 |

**Other**

|                                 |                |
|---------------------------------|----------------|
| Boots and Coots Wildcat Service | (800) 256-9688 |
| Cudd Pressure Control           | (432) 699-0139 |
| Halliburton                     | (575) 746-2757 |
| B.J. Services                   | (575) 746 3569 |

## HYDROGEN SULFIDE DRILLING OPERATIONS PLAN - PERMIAN BASIN

This Hydrogen Sulfide Drilling Operations Plan shall be implemented prior to drilling out from under casing (surface or intermediate) set above potential H<sub>2</sub>S bearing formations.

### I. Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on 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.

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 and the Public Protection Plan.

All personnel entering a location posted with the potential of Hydrogen Sulfide shall be required to carry documentation that they have received the proper training. (Training certificate typically valid for 1 year after training)

### II. Site Specific Information:

Upon installation of H<sub>2</sub>S Safety Equipment and Systems on a well, and prior to drilling out of casing above potential Hydrogen Sulfide bearing formations a briefing with all personnel on location shall be held. The briefing should include a review of H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. This briefing should include site specific elements such as;

- Identification of the briefing areas.
- Discussion of rig orientation and prevailing wind direction.

- Identification of access roads, including secondary egress.
- Confirmation that all personnel have current training.
- Formation tops of potential H<sub>2</sub>S bearing formations.

The H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan shall be available at the well site.

### III. H<sub>2</sub>S Safety Equipment and Systems

1. Well Control Equipment that will be installed prior to drilling out of casing above potential Hydrogen Sulfide bearing formations:
  - A. Choke manifold with a minimum of one adjustable choke.
  - B. At least one choke line must be directed away from the drilling unit and secured at the end. (For closed-loop operations this should be directed to containment bin at the back edge of the location.)
  - C. Blind rams and pipe rams to accommodate all pipe sizes
  - D. Annular preventor
  - E. Properly sized closing unit.
- 1.1 Well control equipment to be available to install as needed should H<sub>2</sub>S be encountered;
  - A. Flare line with electronic igniter or continuous pilot.
  - B. Mud gas separator
  - C. Flare gun with flares.
  - D. One portable S<sub>2</sub>O monitor positioned near flare line.
2. Protective equipment for essential personnel:
  - A. 30-minute air pack units located in the dog house and at briefing areas.
3. H<sub>2</sub>S detection and monitoring equipment:
  - A. 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.
4. Visual warning systems:
  - A. Wind direction indicators.
  - B. 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.

5. Mud program:
  - A. The mud program shall be designed to minimize the volume of  $H_2S$  circulated to the surface. Proper mud weight, safe drilling practices, and the use of  $H_2S$  scavengers will minimize hazards when penetrating  $H_2S$ -bearing zones.
  - B. A mud-gas separator and an  $H_2S$  gas buster will be utilized as required if  $H_2S$  is encountered.
6. Metallurgy:
  - A. All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for  $H_2S$  service.
  - B. All elastomers used for packing and seals shall be  $H_2S$  trim.
7. Communication:
  - A. Communications shall be available on the rig site and in company vehicles. Communications equipment may include one or more of the following; land lines, satellite phones, cellular telephone and 2-way radios.

**PUBLIC PROTECTION PLAN FOR HYDROGEN SULFIDE (H<sub>2</sub>S)**  
**(For use in conjunction with Hydrogen Sulfide Drilling Operations Plan)**

**100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.**

Assumed 100 ppm Radius of Exposure (ROE) = 3000'

**Emergency Procedures**

In the event of a release of gas containing 100 ppm H<sub>2</sub>S, the first responder(s) must;

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H<sub>2</sub>S monitors and air packs in order to safely conduct efforts to control the release.
- Use the "buddy system" to ensure no injuries during the response operations.
- Take precautions to avoid personal injury during the operation.
- Contact operator and/or local officials to aid in operations. See list of phone numbers attached.
- Have received training in the
  - a. Detection of H<sub>2</sub>S
  - b. Measures for protection against H<sub>2</sub>S gas
  - c. Equipment used for protection and emergency response to H<sub>2</sub>S gas

**Ignition of Gas Source**

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

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

| Common Name      | Chemical Formula | Specific Gravity   | Threshold Limit | Hazardous Limit | Lethal Concentration |
|------------------|------------------|--------------------|-----------------|-----------------|----------------------|
| Hydrogen Sulfide | H <sub>2</sub> S | 1.189<br>Air = 1.0 | 10 ppm          | 100 ppm/hr      | 600 ppm              |
| Sulfur Dioxide   | SO <sub>2</sub>  | 2.21<br>Air = 1.0  | 2 ppm           | N/A             | 1000 ppm             |

**Contacting Authorities**

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

## Emergency Phone Numbers

|         |                                           |                 |
|---------|-------------------------------------------|-----------------|
| Artesia | State Police                              | (575) 746 -2703 |
| Artesia | City Police                               | (575) 746 -2703 |
| Artesia | Sheriff's Office                          | (575) 746 -9888 |
| Artesia | Ambulance                                 | 911             |
| Artesia | Fire Department                           | (575) 746 -2701 |
| Artesia | LEPC (Local Emergency Planning Committee) | (575) 746 -2122 |
| Artesia | NMOCD                                     | (575) 748 -1283 |

|          |                                           |                  |
|----------|-------------------------------------------|------------------|
| Carlsbad | State Police                              | (575) 885 -3137  |
| Carlsbad | City Police                               | (575 ) 885 -2111 |
| Carlsbad | Sheriff's Office                          | (575) 887 -7551  |
| Carlsbad | AMBULANCE                                 | 911              |
| Carlsbad | Fire Department                           | (575) 885 - 2111 |
| Carlsbad | LEPC (Local Emergency Planning Committee) | (575) 887 - 3798 |
| Carlsbad | US Bureau of Land Management              | (575) 887 - 6544 |

|                 |                                        |                   |
|-----------------|----------------------------------------|-------------------|
| Santa Fe        | N.M. Emergency Response Commission     | (505) 476 -9600   |
| 24 Hr.          | " " " "                                | (505) 827 -9126   |
| Santa Fe        | N.M. State Emergency Operations Center | (505) 476 -9635   |
| Washington D.C. | National Emergency Response Center     | 1-(800) 424 -8802 |

### **Other Services :**

|         |                       |                                   |
|---------|-----------------------|-----------------------------------|
| Houston | Boots & Coots IWC     | 1-800-256-9688 or (281) 931 -8884 |
| Odessa  | Cudd Pressure Control | (915) 699-0139 or (915) 563 -3356 |
| Artesia | Halliburton           | (575) 746-2757                    |
| Artesia | B.J. Services         | (575) 746-3569                    |

### Air Ambulance

|                 |                                            |                  |
|-----------------|--------------------------------------------|------------------|
| Lubbock, Tx     | Flight For Life, 4000 24th St.             | (806) 743 - 9911 |
| Lubbock, TX     | Aerocare, Rt 3 Box49-F                     | (806) 747 - 8923 |
| Albuquerque, NM | Med Flight Air Amb, 2301 Yale Blvd SE #D3, | (505) 842 - 4433 |
| Albuquerque, NM | S B Air Med Svc, 2505 Clark Carr Loop SE,  | (505) 842 - 4949 |