

Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015

Hydrogen Sulfide (H₂S) Contingency Plan

For

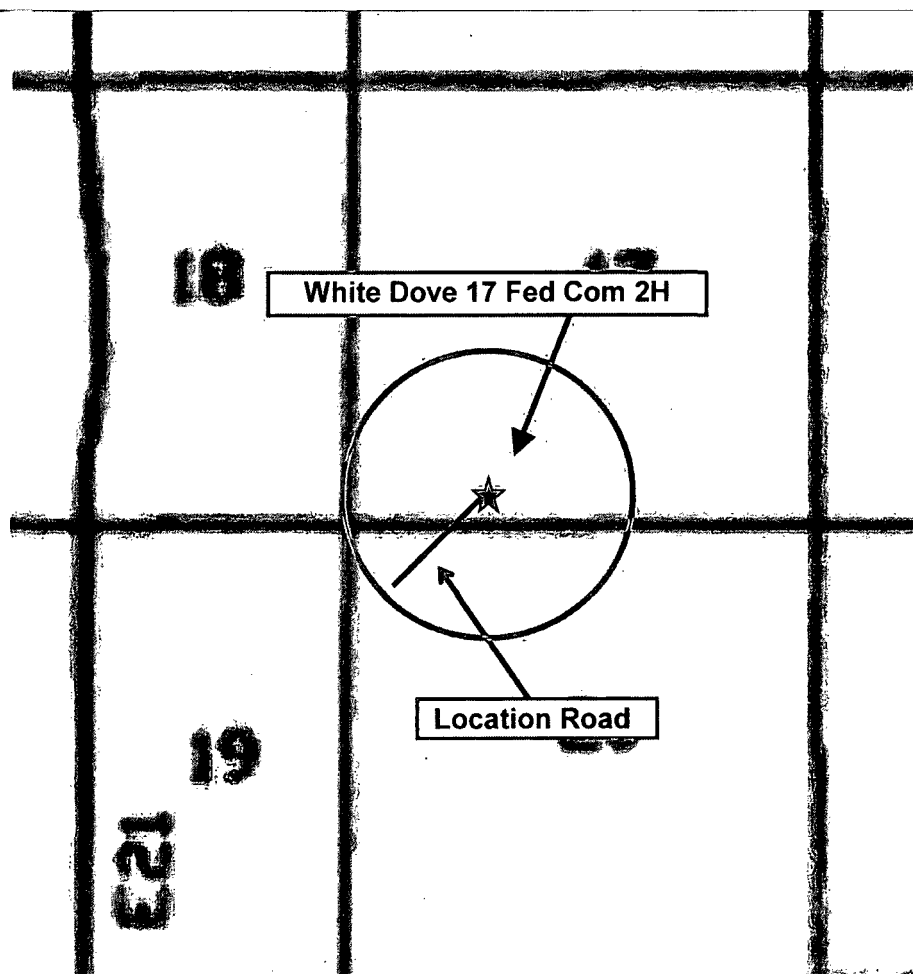
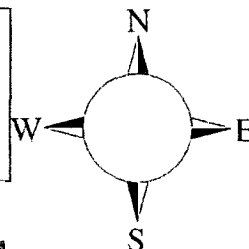
White Dove 17 Fed Com 2H

Sec-17 T-23S R-34E
260' FSL & 1350' FWL
LAT. = 32.2980797' N (NAD83)
LONG = 103.4962835' W

Lea County NM

White Dove 17 Fed Com 2H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Assumed 100 ppm 3000' ()
100 ppm H₂S concentration shall trigger activation of this plan.

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H₂S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H₂S, 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 H₂S monitors and air packs in order to control the release.**
- **Use the "buddy system" to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
 - **Detection of H₂S, and**
 - **Measures for protection against the gas,**
 - **Equipment used for protection and emergency response.**

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Characteristics of H₂S and SO₂

| Common Name | Chemical Formula | Specific Gravity | Threshold Limit | Hazardous Limit | Lethal Concentration |
|-------------------------|-------------------------|--------------------------|------------------------|------------------------|-----------------------------|
| Hydrogen Sulfide | H₂S | 1.189 Air = 1 | 10 ppm | 100 ppm/hr | 600 ppm |
| Sulfur Dioxide | SO₂ | 2.21 Air = 1 | 2 ppm | N/A | 1000 ppm |

Contacting Authorities

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a 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. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H₂S) 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 (H₂S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H₂S 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 H₂S 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 H₂S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H₂S 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 H₂S.

1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. H₂S detection and monitoring equipment:

Portable H₂S monitors positioned on location for best coverage and response. These units have warning lights which activate when H₂S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
- Shale shaker
- Trip tank
- Suction pit
- Rig floor
- Cellar
- Choke manifold
- Living Quarters (usually the company man's trailer stairs.)

Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

4. Mud program:

The mud program has been designed to minimize the volume of H₂S circulated to surface. Proper mud weight, safe drilling practices and the use of H₂S scavengers will minimize hazards when penetrating H₂S bearing zones.

5. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H₂S trim.
- B. All elastomers used for packing and seals shall be H₂S trim.

6. Communication:

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

7. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

Devon Energy Corp. Company Call List

Carlsbad (575)

Cellular

| | |
|---|--------------|
| Drilling Supervisor – Basin – Mark Kramer..... | 405-823-4796 |
| Drilling Supervisor – Slope – Norman Naill..... | 405-760-7234 |
| EHS Professional – Mark Hurst..... | 575-513-9087 |

Agency Call List

Lea **Hobbs**

| | | |
|---------------|--|----------|
| <u>County</u> | Lea County Communication Authority | 393-3981 |
| <u>(575)</u> | State Police | 392-5588 |
| | City Police | 397-9265 |
| | Sheriff's Office | 393-2515 |
| | Ambulance | 911 |
| | Fire Department..... | 397-9308 |
| | LEPC (Local Emergency Planning Committee)..... | 393-2870 |
| | NMOCD..... | 393-6161 |
| | US Bureau of Land Management..... | 393-3612 |

Eddy **Carlsbad**

| | | |
|---------------|---|----------------|
| <u>County</u> | State Police | 885-3137 |
| <u>(575)</u> | City Police | 885-2111 |
| | Sheriff's Office | 887-7551 |
| | Ambulance | 911 |
| | Fire Department..... | 885-2111 |
| | LEPC (Local Emergency Planning Committee)..... | 887-3798 |
| | US Bureau of Land Management..... | 887-6544 |
| | NM Emergency Response Commission (Santa Fe) | (505) 476-9600 |
| | 24 HR | (505) 827-9126 |
| | National Emergency Response Center (Washington, DC) | (800) 424-8802 |

Emergency Services

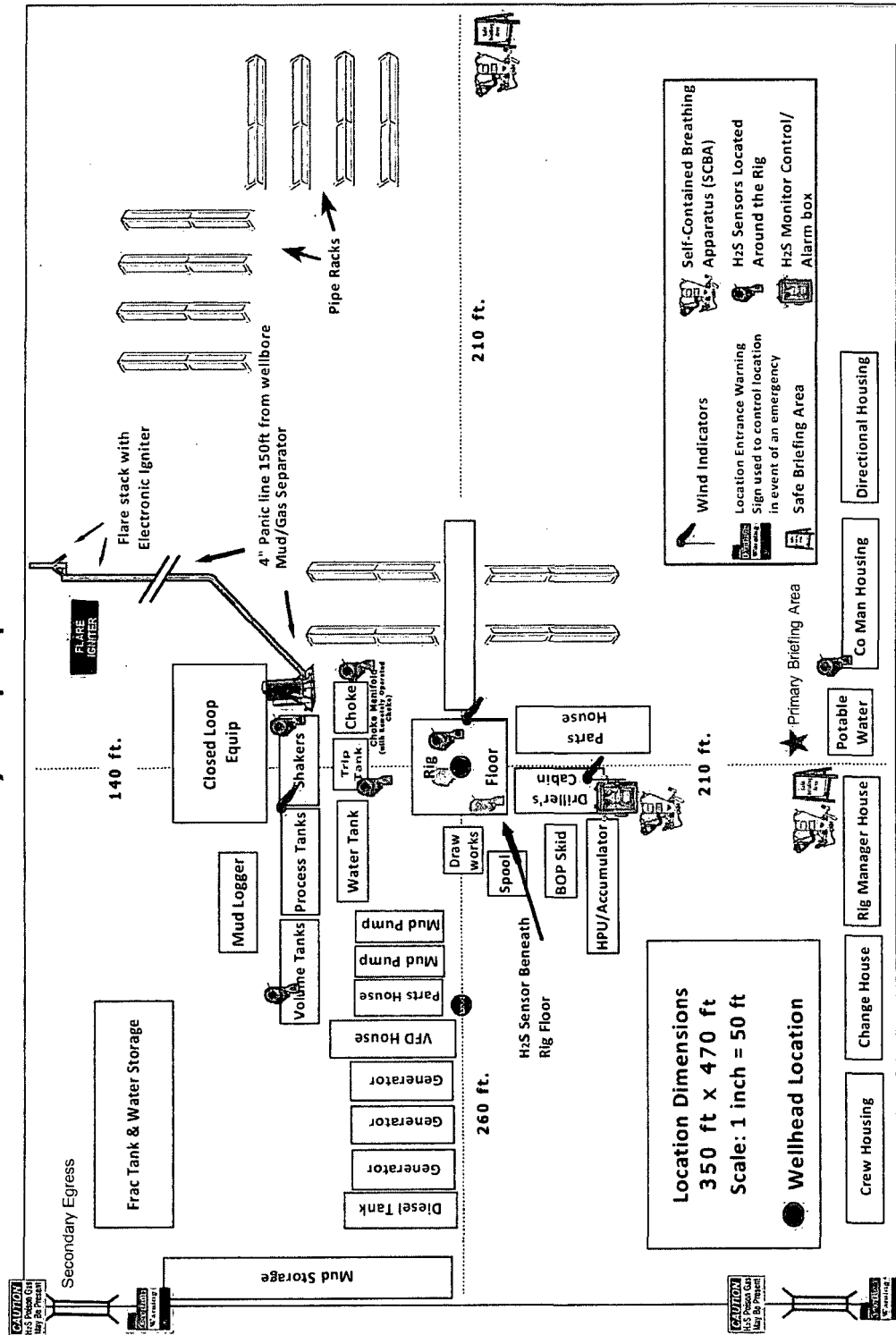
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|----------------------------|----------------------------------|
| Wild Well Control | (281) 784-4700 |
| Cudd Pressure Control..... | (915) 699-0139 or (915) 563-3356 |
| Halliburton | (575) 746-2757 |
| B. J. Services..... | (575) 746-3569 |

| | | |
|------------------|--|----------------|
| <i>Give</i> | Native Air – Emergency Helicopter – Hobbs..... | (575) 392-6429 |
| <i>GPS</i> | Flight For Life - Lubbock, TX | (806) 743-9911 |
| <i>position:</i> | Aerocare - Lubbock, TX | (806) 747-8923 |
| | Med Flight Air Amb - Albuquerque, NM | (575) 842-4433 |
| | Lifeguard Air Med Svc. Albuquerque, NM | (575) 272-3115 |

Prepared in conjunction with
Dave Small



Devon Energy - Well Pad Rig Location Layout Safety Equipment Location





Proposed Interim Site Reclamation

Devon Energy Production Co.
White Dove 17 Fed Com 1H &
2H
Sec. 17-T23S-R34E
Lea County, NM



Proposed
Reclamation
Area



Scale: 1in = 60ft.

