



**Objective #1: Promote communication between the oil and gas industry and wildland fire officials before and during wildland fire incidents.**

SOP's promote developing and maintaining communication between: IC's and oil and gas field personnel; Dispatch and fire managers and oil and gas safety representatives.

**Objective #2: Identify standardized operating procedures for wildland fire incidents within the oil and gas field.**

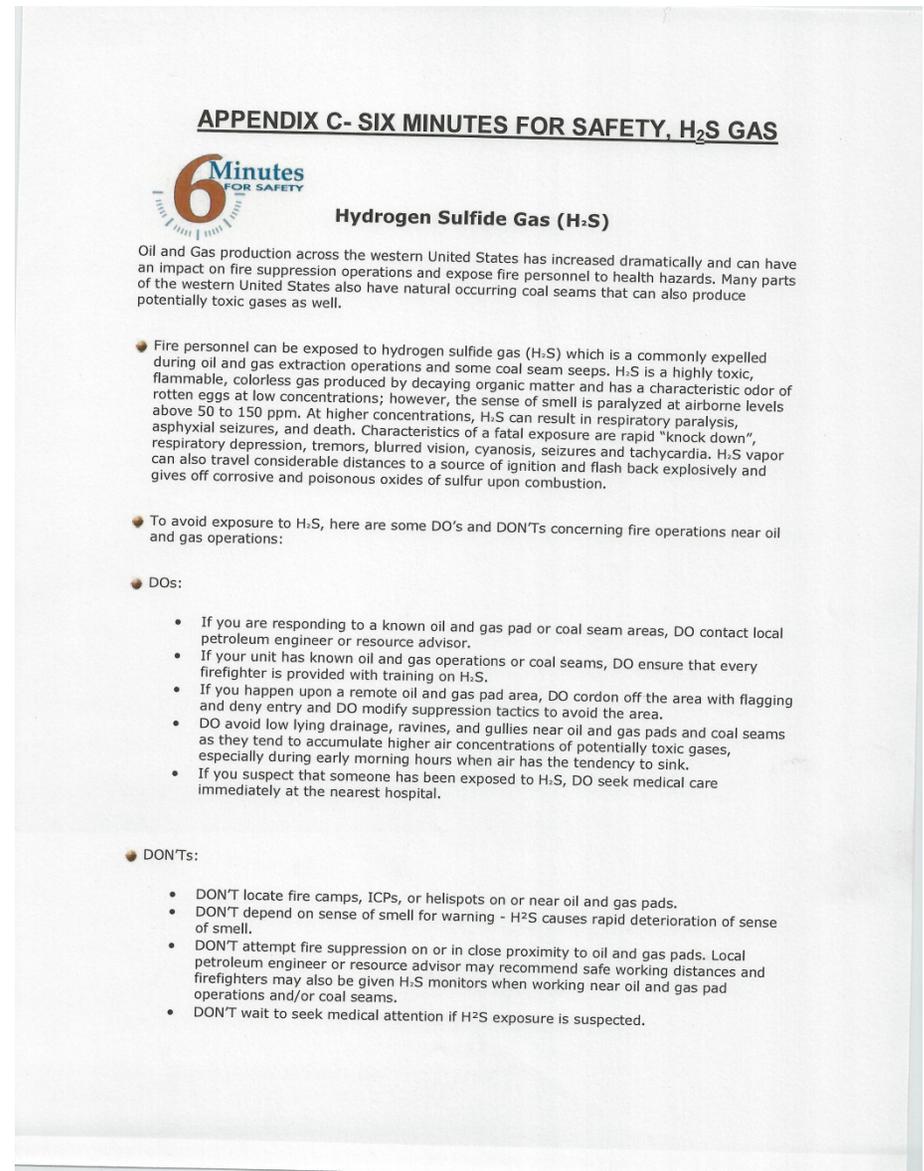
The intent of the following SOP's is to increase the overall situational awareness of the wildland firefighter while working in oil and gas fields.

Hazards may exist that are not covered in the following material and hopefully this discussion regarding oil and gas industry safety will better prepare all personnel to identify those hazards.

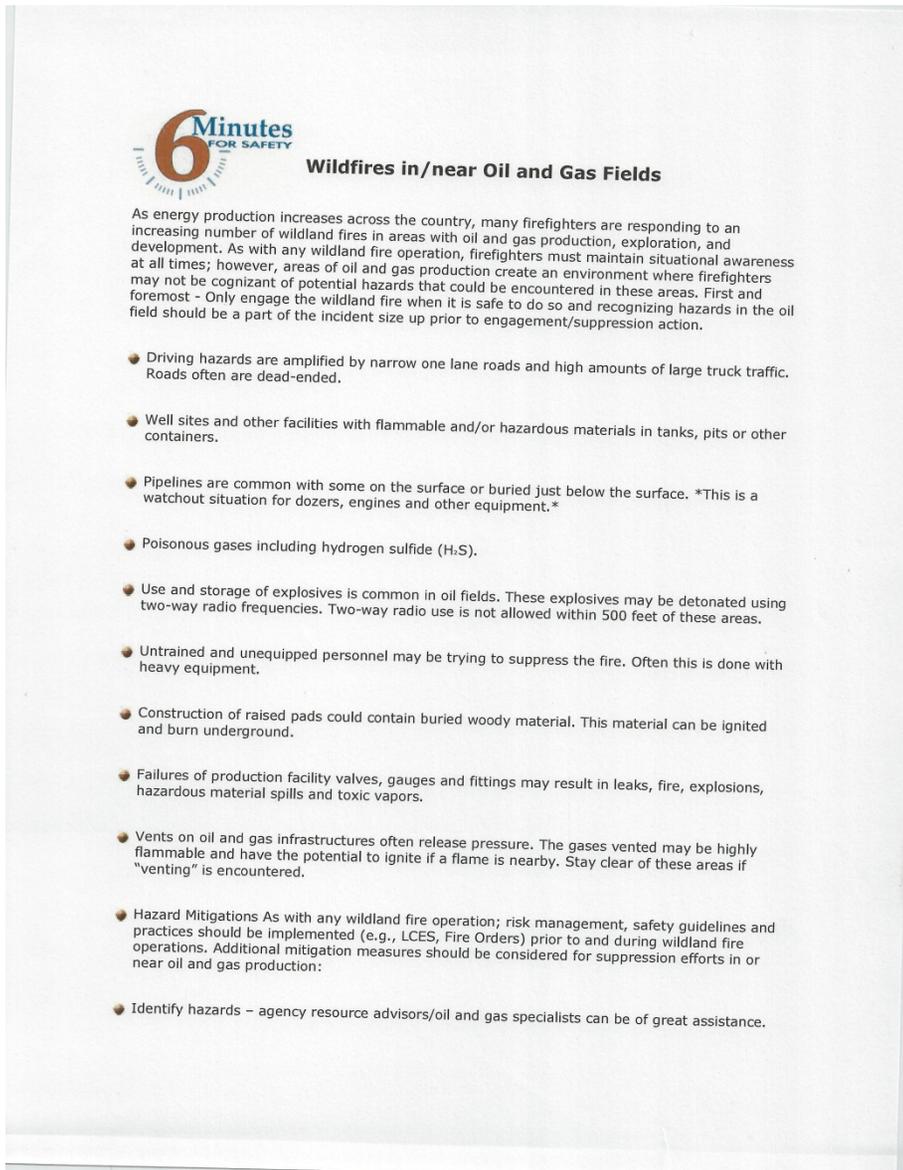
**Pre-Fire Season SOP's:**

- Fire managers will identify points of contact between federal wildland firefighting agencies and the oil and gas industry including oil and gas company safety representatives.
- An oil and gas industry liaison has been identified who will distribute and disseminate safety and fire danger information to individual oil and gas companies and eventually to all oil and gas field personnel.
- The liaison will identify oil and gas company safety representatives who will address industry issues and advise the Incident Commander during large (Type 1, 2 & 3) wildland fire incidents.

**Optional Reference: Six Minutes for Safety. H<sub>2</sub>S**



## Optional Reference: 6 Minutes for Safety. Oil and Gas



## Pre-Fire Season SOP's: Continued.

- Durango Interagency Zone Board will annually update and distribute Informational Safety Sheets to all wildland fire and oil and gas field personnel. The Board will ensure that all member agencies include oil and gas industry safety as a topic in the annual wildland fire refresher, RT-130.

## Type 5 Incident SOP'S

- Type 5 fires are: Low complexity, single resource response and short duration.
- Encourage communication between oil and gas field personnel and responding wildland fire personnel.
- The Incident Commander (ICT5) will ensure that all personnel on the fire are qualified for the position they are performing. All other non-qualified personnel will be notified to disengage from the fire.

## Type 4 Incident SOP'S

- Type 4 fires are: Moderate complexity, multiple resources and typically 1-2 day duration.
- Encourage communication between oil and gas field personnel and responding wildland fire personnel.
- The Incident Commander (ICT4) will ensure that all personnel on the fire are qualified for the position they are performing. All other non-qualified personnel will be notified to disengage from the fire.
- The Incident Commander (ICT4) will notify Durango Dispatch of the presence of oil and gas infrastructure and the owner of the infrastructure near or threatened by the fire perimeter. Owner information is located on signs on all well pads.

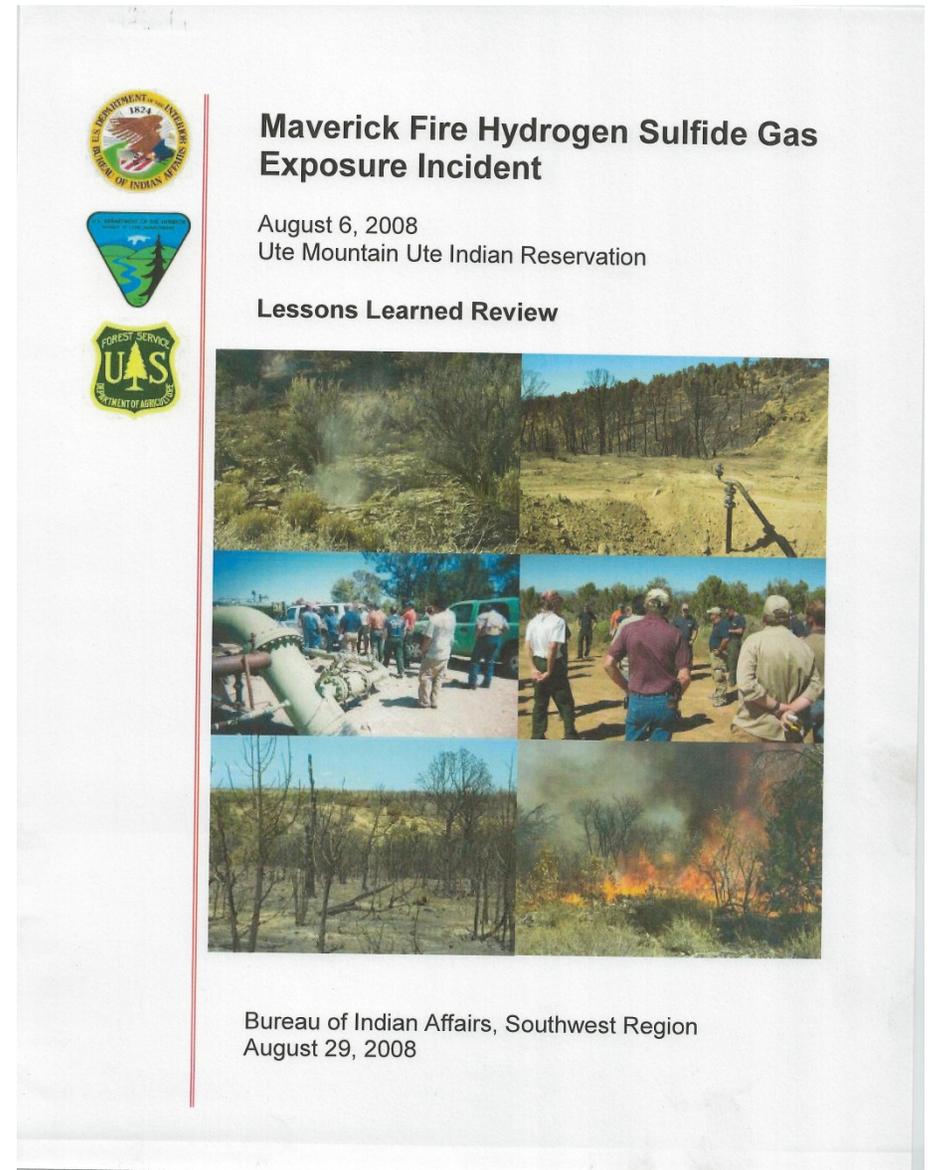
#### Type 4 Incident SOP's: Continued.

- Durango Dispatch will contact the Oil and Gas Industry Liaison who in turn, will notify the safety representative of the owner company.
- If dozer operations are anticipated, Durango Dispatch will notify the appropriate utility representatives for required actions. (line locate, power shut off, etc.)
- It is recommended that the Incident Commander consult with the highest ranking oil and gas field employee on site before implementing tactics or strategies that use or affect oil and gas infrastructure.

#### Type 3,2 or 1 Incident SOP'S

- Type 3, 2 & 1 Fires are: High complexity, numerous resources, multiple day duration.
- The Incident Commander will notify Durango Dispatch of the presence of oil and gas infrastructure and the owner of the infrastructure near or threatened by the fire perimeter.
- Durango Dispatch will contact the Oil and Gas Industry Liaison who in turn, will notify the safety representative of the owner company.
- If dozer operations are anticipated, Durango Dispatch will notify the appropriate utility representatives for required actions – line locate, power shut off, etc.
- The oil and gas company safety representative should be available to the Incident Commander for advice and information regarding Oil and Gas industry issues.

#### Optional Reference: Maverick Fire H<sub>2</sub>S Exposure Incident



The slide features three logos on the left: the Bureau of Indian Affairs seal, the Ute Mountain Ute Indian Reservation logo, and the U.S. Forest Service logo. The main title is 'Maverick Fire Hydrogen Sulfide Gas Exposure Incident'. Below the title is the date 'August 6, 2008' and the location 'Ute Mountain Ute Indian Reservation'. The section is titled 'Lessons Learned Review' and contains a 2x2 grid of photographs: top-left shows smoke rising from a brushy area; top-right shows a dirt road with a utility pole; middle-left shows a group of people gathered around a large green pipe; middle-right shows a group of people standing in a field; bottom-left shows a landscape with charred trees; bottom-right shows a fire burning in a brushy area. At the bottom right, it says 'Bureau of Indian Affairs, Southwest Region August 29, 2008'.

**Maverick Fire Hydrogen Sulfide Gas Exposure Incident**

August 6, 2008  
Ute Mountain Ute Indian Reservation

**Lessons Learned Review**



Bureau of Indian Affairs, Southwest Region  
August 29, 2008

## **Objective #6: Identify gas hazard areas. Continued.**

### Hazardous Gas Zone Operational SOP's:

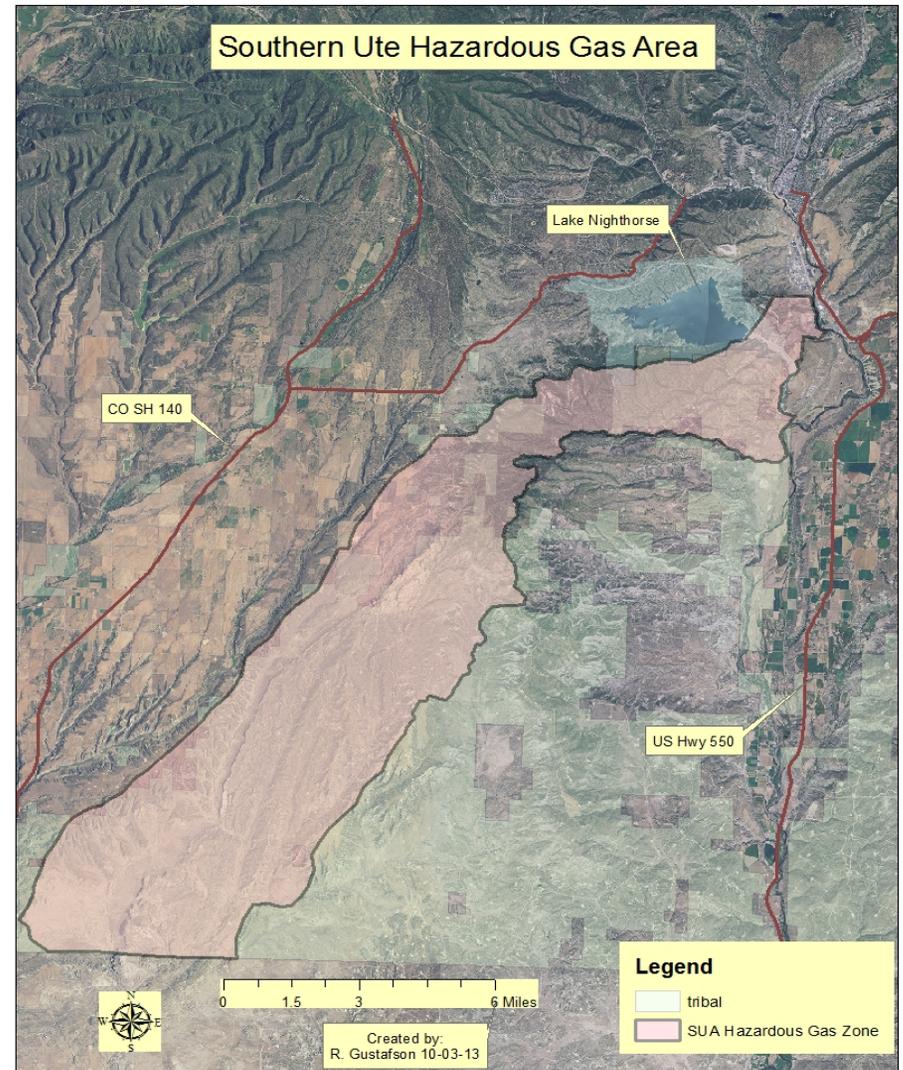
- Firefighters must have had the “Well and Gas Hazards Safety Training”, or equivalent, before entering the Hazardous Gas Zone.
- Notify Durango Fire Dispatch that the fire is in the Hazardous Gas Zone.
- Gas asphyxiation symptoms and emergency evacuation procedures will be included in a fire briefing before engaging. All personnel will monitor themselves and fellow firefighters for symptoms. The Single Resource Boss will coordinate and carry out the emergency evacuation plan when necessary.
- Each resource (dozer, crew, engines) will have a H2S monitor with them at all times. Single Resource Bosses will ensure that subordinates stay within proximate distance of the monitor. If individual personnel need to be separated (scouts, lookouts, sawyers, etc.), they will receive individual gas monitors.
- Once engaged, the Single Resource Boss or other line Supervisor will manage and avoid prolonged exposure of their personnel so as not to exceed 6 hours in one area per shift within the Hazardous Gas Zone. Rotate personnel as needed and remove anyone who exhibits early signs or symptoms of gas asphyxiation.

## **Objective #3: Reference informational safety sheets to promote the identification of oil and gas industry hazards and possible ways to mitigate those hazards.**

- Oil and gas facilities have hazards that pose threats to wildland firefighters
- When arriving on scene, notify Durango Dispatch Center of the owner of the facility and its location.
- Seek out oil and gas well personnel to get information regarding the condition of surrounding oil and gas infrastructure and associated hazards.
- The large, open spaces created by well pads and rights-of-way make convenient and tempting areas for firefighting operations, staging areas, and safety zones yet the presence of hazardous materials, high pressure pipelines and industrial equipment can create a dangerous environment for untrained personnel.
- If staging more than three vehicles or pieces of equipment on a well pad location, ask Durango Dispatch to notify the owner/operator of the well (usually identified on the well location sign). See well diagram for safe areas to park on a well pad. Generally, these areas are outside of the well rig anchors and 20 feet away from any production equipment or pipelines.
- Open pits/dumps should be avoided as they could contain discharging gas. When driving on a well pad, avoid backing up around production equipment. Park in such a way that allows full vision of surrounding hazards and avoids the need for backing.

### Objective #3: Reference Information. Continued.

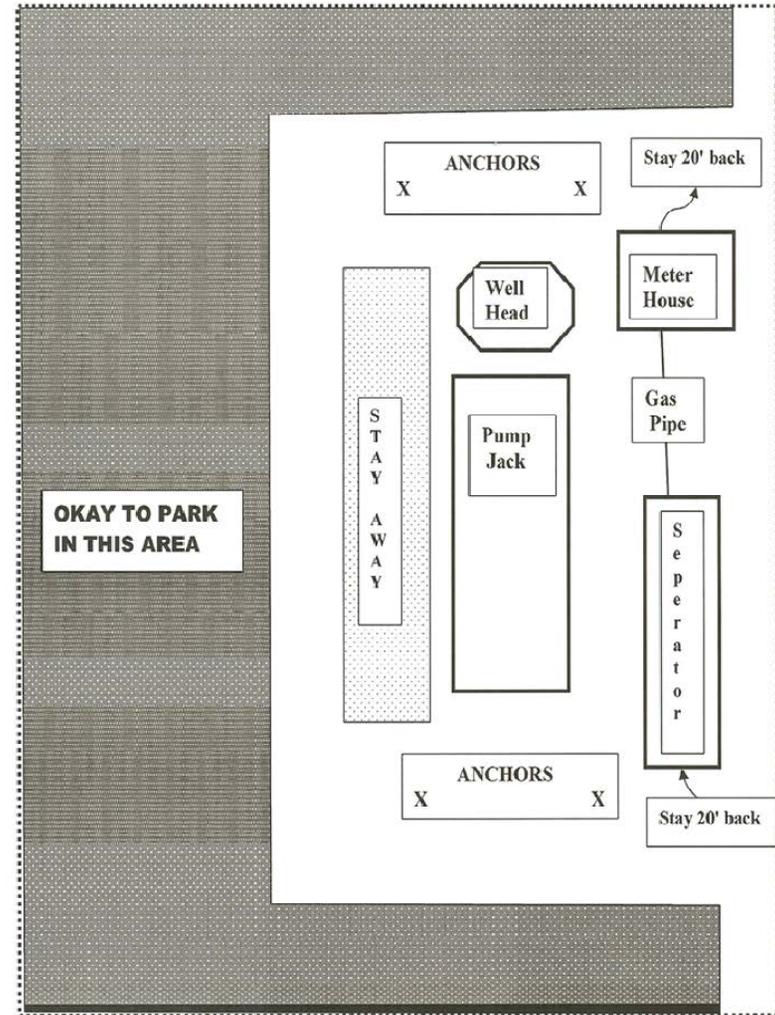
- When well sites are well maintained and fully functional, they are relatively safe places and can withstand the high temperatures associated with wildland fires. Not all well sites are well maintained however, and noxious and flammable gases can be present around the well site. If these gases are ignited, a potential flare-up or explosion could occur.
- Toxic and harmful gases, such as Hydrogen Sulfide (H<sub>2</sub>S), may be present in harmful concentrations around well sites and well equipment. These gases may or may not smell and are heavier than air and sink to low areas. Avoid low areas during calm, windless periods.
- If dozer operations are likely, ask Durango Dispatch to notify the appropriate utility representative. Do not assume that pipelines are buried deeply or are directly under their markers. Dozer operators and bosses need to be extremely cautious.
- Engines should avoid rights-of-way due to exposed pipelines and dog-legs (pipe rising above ground from pipelines).



**Objective #4: Identify well pad infrastructure and hazards associated with the infrastructure.**



**SAFE PARKING AREAS FOR FIREFIGHTERS AT GAS WELLS**



- Stay Outside the Anchor Pattern
- Stay Away from Equipment that is Outside of Anchors by 20 feet.

Well Pad Infrastructure. From Top Left Clockwise Separator Unit, Collection Pit, Pump head, Right of way with Dog leg



**Objective #6: Identify gas hazard areas. Continued.**

Areas where toxic gases may be present:

- Noxious gases exist naturally in many areas yet are more likely to be present near gas well installations.
- So. Ute and Ute Mtn/Barker Dome Hazardous Gas Zone. See Maps on next two pages.

Southern Ute and Ute Mountain/Barker Dome Hazardous Gas Areas/Zones.

- The southern border area between Southern Ute and Ute Mountain Reservation is of particular concern regarding noxious gas. In 1999, two firefighters became ill with symptoms consistent with asphyxiation and gas poisoning.
- The areas have potential for noxious gases to be present. The boundary encompasses the Barker Dome area east to areas above and surrounding the Fruitland Outcrop Coal Seam.
- See the following Maps and Standard Operating Procedures for these Hazardous Gas Areas.
- Contact Southern Ute or Ute Mountain Ute Fire Management for more information.

## Objective #6: Identify gas hazards. Continued.

### Methane: Abbreviated CH<sub>4</sub>

#### Principle Component of Natural Gas

#### Properties & Hazards:

- Colorless
- Odorless
- Flammable (if 5% of atmosphere)
- Lighter than air (40% lighter than air)

#### Response to Detected/Suspected CO

- Leave Area Immediately—Go Upwind
- Seek Medical Help, if needed

### Gas Monitors

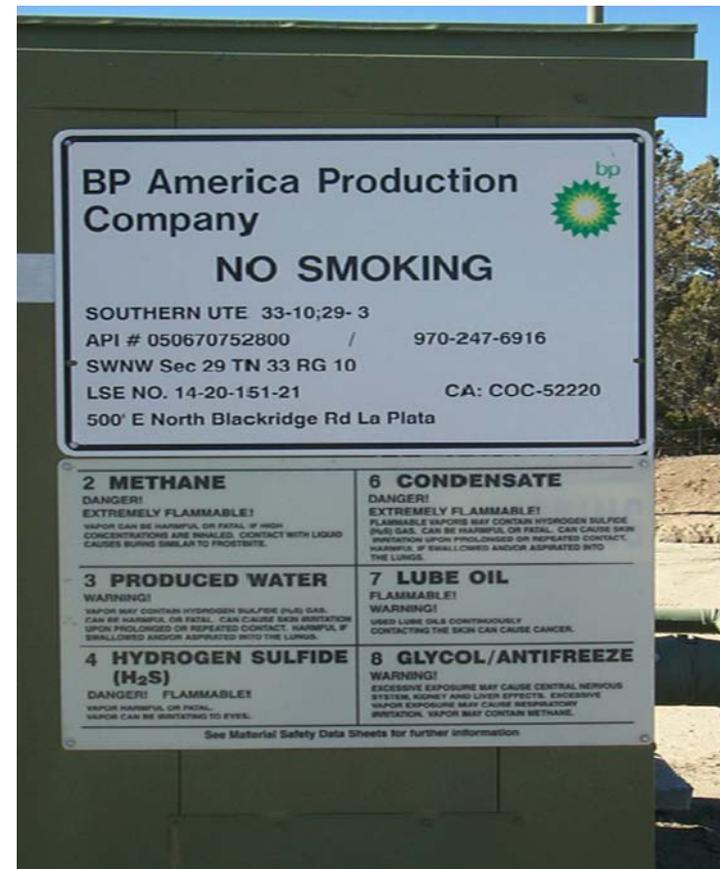
Numerous available but two styles generally used:

- 4 Gas Measures CO, H<sub>2</sub>S, O<sub>2</sub>, & LEL
- Single Gas measures one gas (ie.H<sub>2</sub>S) only.
- Will sound low or high (louder with vibrate) alarm when thresholds are exceeded.
- After an Alarm sounds it will go off automatically only after gas level drops below threshold.
- Low thresholds set near or at OSHA 8 hour PEL (Permissible Exposure Limit).
- Low alarm for H<sub>2</sub>S at 10 PPM. High alarm at 20 PPM.
- Low alarm for CO at 35 PPM. High alarm at 70 PPM. O<sub>2</sub> range from 19.5% - 23.5%LEL range from 10 – 20%.
- 4 Gas will show peak levels and time weighted average of exposure.

## Objective #5: Identify sources of oil and gas information available to wildland firefighters.

All well sites should be signed with the following:

- Owner (BP Amoco)
- Location – S/T/R or Lat/Long (S-29, T-33N, R-10W) Well Number (So. Ute 33-10-29-3)
- Hazards on-site



**Objective #5: Information sources. Continued.**

Durango Interagency Dispatch Center will be the primary contact for underground and above ground utility services for wildfires.

Inform Dispatch of all pertinent information regarding location of existing utilities and any planned disturbances that may impact utilities (dozer ops, smoke impacts to utility lines).

**Objective #6: Identify gases hazards and the areas that they may be found in. Identify methods of mitigating the hazard.**

Hazardous gases in the area:

- Hydrogen Sulfide (H<sub>2</sub>S)
- Carbon Monoxide (CO)
- Methane (CH<sub>4</sub>)

**Hydrogen Sulfide. Abbreviated H<sub>2</sub>S**

Synonyms Include:

- Sour Gas
- Sewer Gas

Properties & Hazards:

- Colorless
- Toxic
- Potentially deadly at concentration above 100 ppm.
- Flammable (if 4.3% of atmosphere)
- Paralyzes sense of smell.
- Heavier than air (21% heavier than air)

Symptoms of H<sub>2</sub>S Exposure include:

- Eye Irritation
- Dryness/irritation of throat

**Objective #6: Identify gas hazards. Continued.**

Symptoms of H<sub>2</sub>S Exposure include:

- Irritation of respiratory system
- Loss of Smell Headache Nausea Vomiting

Response to Detected/Suspected H<sub>2</sub>S

- Leave Area Immediately—Go Upwind and uphill
- Seek Medical Help, if needed

**Carbon Monoxide: Abbreviated CO**

Synonyms include:

- Carbon Oxide
- Flue Gas
- Monoxide

Properties & Hazards:

- Colorless
- Toxic

Symptoms of Carbon Monoxide Exposure include: Headache

- Fatigue
- Nausea
- Dizziness
- Shortness of Breath
- Unconsciousness

Response to Detected/Suspected CO

- Leave Area Immediately—Go Upwind
- Seek Medical Help, if needed