Correspondence

Case No. 12897

April 2002

Ross, Stephen

From: Gene_Montgomery@oxy.com
Sent: Wednesday, April 17, 2002 5:58 AM
To: seligman@nmoga.org
Cc: gallagher@nmoga.org; rcanderson@state.nm.us; sross@state.nm.us; WPrice@state.nm.us
Subject: RE: Updated Draft of H2S Standard

Roads.doc

I have a few comments to pass on re Bruce's draft changes.

In section E.4.c.v my notes indicate that some wording changes were needed concerning the call list indicating what reasonable efforts would be appropriate to keep the list current.

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Also, as promised, attached is information on the exposure of passengers in a vehicle that we have used in other plans in Texas. This calculation determines that a person could safely drive through an H2S cloud with windows open at an outside concentration up to 6700 ppm. Again, we do not think that this standard should consider a parked vehicle. If we do that we are in essence make every "public road" a "public area" under this standard. This seems to us to be an overly conservative approach.

Thanks so much for opportunity to meet and for lunch! I think we made a lot of progress last week and I feel good about the fact that we have arrived at a solution that is very protective of the public. If I can be of any help please let me know.

-----Original Message-----
From: Deborah Seligman [mailto:seligman@nmoga.org]
Sent: Monday, April 15, 2002 5:38 PM
To: seligman@nmoga.org
Cc: gallagher@nmoga.org; rcanderson@state.nm.us; sross@state.nm.us; WPrice@state.nm.us
Subject: Fwd: Updated Draft of H2S Standard

Attached is an updated draft H2S Rule from Bruce Gantner. The notes were taken at our meeting with Wayne Price, Roger Anderson and Steve Ross from OCD on Thursday, April 11. I will circulate Steve's changes once they are received.

Based upon my notes, here is the latest version of the NMOCD H2S

Standard.
There were some sections that Steve was going to work on so those are not included.

Bruce Gantner
Burlington Resources
San Juan Division
Phone: 505/326-9842
FAX: 505/599-4005
email: bgantner@br-inc.com

CRITICAL H2S CONCENTRATIONS

From a toxic dosage point of view, there is essentially no risk to traffic, since the exposure times are so short. However, instantaneous exposures to lethal or incapacitating concentrations may be possible. Described below are some references that describe the effects of H_2S in this critical concentration range:

1. Det Norske Veritas: 1000 ppm = Immediate acute poisoning; 1000-2000 ppm = lethal after 30 to 60 minutes; 2000 ppm = acute lethal poisoning. The fatality probit suggests a 1% fatality at 1000 ppm after 4 minutes exposure time.
2. NIOSH web site: LC_{Lo} = 800 ppm in 5 minutes; "700 to 1,000 ppm results in rapid unconsciousness, cessation of respiration, and death in a few minutes"
3. MSDS (Genium Publishing): "It is highly toxic and can be instantly fatal if inhaled at concentrations of 1000 ppm or greater."
4. Sax, Dangerous Properties of Industrial Materials, 6th Ed.: "Exposures of 800-1000 ppm may be fatal in 30 min, and high conc are instantly fatal."
5. ERPG/AIHA (old version): 1000-2000 ppm, duration <20 min, 22 of 340 died; 1000 ppm, duration < 1 min, 1 of 10 exposed died

For the purposes of this discussion, it is conservatively estimated that a fatal exposure may occur only if an average concentration of 1000 ppm is experienced in the vehicle for any period of time (in which case the person is considered an instant fatality).

RISKS TO PERSONS TRAVELLING ON HIGHWAYS

To assess the risks to vehicles on the highway, it is necessary to estimate the concentrations that might be experienced within the vehicle. This is reviewed below.

Windows Closed

For vehicles having their windows closed, it is assumed that there is no impact to the vehicle occupants. The short duration of time in the cloud (see below), and the small number of air changes in the vehicle make the exposure level too small to be incapacitating. It is further assumed that the probability of a vehicle having its windows closed is 0.5.

Windows Open

For vehicles with the windows open, the concentration in the vehicle depends on the outside concentration, the time the vehicle spends in the cloud, and how often the air changes in the vehicle. The outside concentration depends on the dispersion analyses performed earlier; the other factors are discussed below.

Time the Vehicle is in the Cloud

For most releases, the width of a cloud at 1000 ppm or greater concentration is generally just a couple feet or less. Therefore, a vehicle travelling at normal

highway speeds should pass through the cloud in well under 0.1 seconds. However, it is recognized that if the driver perceives the leak, he or she may slow down to have a look. Therefore, for the purposes of this analysis it is estimated that a vehicle will spend about 0.3 seconds in the cloud, which is felt to be a conservative assumption.

Air Changes

Assuming that the windows are wide open, and ventilation fans are running, a rapid turnover of air can take place. For this analysis, it is assumed that the air in a vehicle will be replaced once every two seconds. There are both conservative and non-conservative assumptions built into this. First, on the whole, it is expected that the air change rate will probably be somewhat less than once per two seconds. However, it should be recognized that the passengers will be sitting very near the point where the air will be flowing in, and so may see a disproportionately high concentration.

Concentration in the Vehicle

Assuming good mixing of the air in the vehicle, the following is an approximation of the concentration of H_2S in the vehicle:

$$C_{inside} \sim C_{outside}\ (AC)\ (t)$$

where

C_{inside} = concentration of H_2S in the vehicle
$C_{outside}$ = concentration of H_2S in the ambient air
AC = number of air changes per second
t = number of seconds the vehicle is in the cloud

Based on the above estimates of time, air changes and critical concentration, we are therefore only interested in outside concentrations of 6700 ppm or greater. Note that use of this concentration makes the "time in the cloud" estimate seem very conservative; however, it is assumed that natural barriers, gullies, etc. will allow a cloud to collect to some degree, so the original "few feet" plume calculation is maintained.

Ross, Stephen

From: Deborah Seligman [seligman@nmoga.org]

Sent: Wednesday, April 17, 2002 4:22 PM

To: Bob Manthei; Cal Wrangham; Dan Girand; Gene Butler; Ken Houston; Mike LaMonica; Dean Chumbley; Bruce Gantner; Rick Foppiano; Gene Montgomery; Linda Berryman; Gregory A Hyde

Cc: gallagher@nmoga.org; rcanderson@state.nm.us; sross@state.nm.us; WPrice@state.nm.us

Subject: Updated Draft of H2S Standard

Below are comments that Gene Montgomery had on the draft circulated yesterday afternoon. Bruce Gantner updated yesterday's draft for your review which I have attached. I have spoken to Stephen Ross and he will update his part as soon as possible.

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DISCUSSION DRAFT, ~~3-14-02~~ 4-17-02
RULE: 19.15.__.____ Hydrogen Sulfide Gas (Hydrogen Sulfide)

OUTLINE:

A. In General.
B. Applicability
C. Definitions
    1. ANSI
    2. API
    3. ASTM
    4. Dispersion Technique
    5. Escape Rate
    6. GPA
    7. LEPC
    8. NACE
    9. PPM
    10. Potentially Hazardous Volume
    11. Public Area
    12. Public Road
    13. Radius of Exposure
D. Determination of Hydrogen Sulfide Risk
    1. Determination of Hydrogen Sulfide Concentration
    2. Tested Concentrations Below 100 ppm
    3. Tested Concentrations Above 100 ppm; Calculation of the Radius of Exposure
    4. Recalculation
E. H_2S Contingency Plan
    1. In General
    2. When Required
    3. Input From Emergency Response Authorities and the Division
    4. Elements
    5. Submission
    6. Failure to Submit Plan
    7. Annual Review, Amendment
    8. Retention and On-Site Inspection
    9. Activation Levels
F. Protection from Hydrogen Sulfide During Drilling, Workover and Servicing Operations.
    1. API Standards
    2. Minimum Standards
    3. Operating Practices In Hydrogen Sulfide Concentrations of 100 ppm or Greater
G. Protection from Hydrogen Sulfide at Producing Wells, Tank Batteries etc.
    1. API Standards
    2. Minimum Standards
    3. Modification or Repair
    4. Compliance Schedule
H. Personnel Protection and Training
I. Standards for Equipment That May Be Exposed to Hydrogen Sulfide
J. Hydrogen Sulfide Injection
K. Exemptions
L. Release
    1. Activation of the H_2S Contingency Plan
    2. Notification of the Division
M. Additional Standards

19.15.__.__ Hydrogen Sulfide Gas (Hydrogen Sulfide)

A. In General. Hydrogen sulfide gas (known by its chemical abbreviation " H_2S" or as "sulfurated hydrogen" or "hydrosulfuric acid") is a flammable, poisonous gas that may occur naturally as a component of crude petroleum and natural gas. The gas has a distinct and characteristic odor of rotten eggs but due to olfactory fatigue may not be sensed by the human sense of smell.

B. Scope. This Section provides for public safety in areas where hydrogen sulfide gas, H_2S is in concentrations greater than listed below. This Section applies to any person, operator or facility subject to the jurisdiction of the Division, including, but not limited to, any person, operator or facility engaged in drilling, stimulating, completing, working over or producing any oil, natural gas or carbon dioxide well or any person, operator or facility engaged in gathering, transporting, storing, processing or refining of crude oil, natural gas or carbon dioxide.

C. Definitions (specific to this Section).

1. ANSI. The acronym "ANSI" means the american national standard institute.
2. API. The acronym "API" means the american petroleum institute.
3. ASTM. The acronym "ASTM" means the american society for testing and materials.
4. Dispersion Technique. A "dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of H_2S gas in the atmosphere.
5. Escape Rate. The "escape rate" is the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing H_2S. The escape rate is calculated using the maximum daily rate of the gaseous mixture produced or the best estimate thereof. For a natural gas well, the escape rate shall be calculated by using the current daily absolute open flow rate against atmospheric pressure. For an oil well, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or best estimate thereof. For an oil or natural gas well drilled in an undeveloped area, a wildcat well, the escape rate may be determined by using offset wells completed in the interval in question, or using some other reasonable means to calculate the escape rate. For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of gaseous mixture through the facility or operation.
6. GPA. The acronym "GPA" means the gas processors association.
7. LEPC. The acronym "LEPC" means the local emergency planning committee established pursuant to the emergency planning and community right-to-know act, 42 U.S. C. § 11001.
8. NACE. The acronym "NACE" refers to the national association of corrosion engineers.
9. PPM. The acronym "ppm" means "parts per million," by volume.
10. Potentially Hazardous Volume (hereinafter referred to as a "potentially hazardous volume" or by the acronym "PHV") means the volume of hydrogen sulfide gas of such concentration that:
    a. the 100 ppm radius of exposure includes any public area as defined herein;
    b. the 500 ppm radius of exposure includes any public road as defined herein; or
    c. the 100 ppm radius of exposure is in excess of 3,000 feet.
11. Public Area. A "public area" is any dwelling; office; place of business; church; school; hospital; school bus stop; government building; or any portion of a park, or other similar ~~populated~~ area where the public may reasonably be expected to frequent, but does not include facilities directly involved in oil and gas production, such as producing oil and gas wells, pipelines, tank batteries, production equipment, gas plants, refineries.
12. Public Road. A "public road" is any road or highway that is under the jurisdiction of a federal, state, county, or municipal government for maintenance or public use. A public road is not a private road, two track, ranch, or oil and gas lease road.
13. Radius of Exposure. The radius of exposure (hereinafter referred to as "radius of exposure" or "ROE") is an imaginary circle constructed around a point of escape the radius of which is calculated using the following Pasquill-Gifford derived equation, or by such other method as may be approved by the division:

declared public road?

a. For determining the 100-ppm radius of exposure: $X= [(1.589)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, or

b. For determining the 500-ppm radius of exposure: $X=[(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$

Where: X= radius of exposure in feet: hydrogen sulfide concentration = decimal equivalent of the mole or volume fractions of hydrogen sulfide in the gaseous mixture; Q= maximum volume of gas determined to be available for escape in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

c. As an alternative for determining either the 100 ppm or the 500 ppm radius of exposures, a dispersion technique that takes into account representative wind speed, direction, atmospheric stability, complex terrain and other dispersion features may be utilized in lieu of the above Pasquill Gifford equations. Such techniques may include, but shall not be limited to, one of a series of computer models outlined in the environmental protection agency's "Guidelines on Air Quality Models (EPA-450/2-78-027R)."

d. Where multiple sources of hydrogen sulfide are present (e.g. wells, treatment equipment, flow lines, etc.), the radius of exposure may encompass a larger area than would otherwise be calculated using a radius of exposure computation for each component part.

e. For a well being drilled in an area where insufficient data exits to calculate a radius of exposure, but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100 ppm radius of exposure equal to 3,000 feet shall be assumed.

D. Determination of Hydrogen Sulfide Risk.

1. Determination of Hydrogen Sulfide Concentration.

a. Each person, operator or facility to which this Section applies shall determine the hydrogen sulfide concentration within each of its operations or systems. A representative sample for each system or operation may be used for testing provided that the person, operator or facility can demonstrate that the concentration derived from a test of the representative sample is reasonably representative of the hydrogen sulfide concentration within the operation or system.

b. ~~b.~~ The tests referred to in the previous Subparagraph shall be conducted in accordance with applicable ASTM and GPA standards or by other methods approved by the division.

c. Tests conducted prior to the effective date of this Section may be utilized to satisfy this requirement, provided that the method used meets D.1.b above.

2. Tested Concentrations Below 100 ppm. If the testing described in the previous Paragraph determines that the hydrogen sulfide concentration in a given operation or system is less than 100 ppm, no further actions are required pursuant to this Section.

3. Tested Concentrations Above 100 ppm; Calculation of the Radius of Exposure.

a. If the testing described in Paragraph 1 of this Subsection determines that the concentration of hydrogen sulfide in a gaseous mixture is 100 ppm or greater, then the person, operator or facility must calculate the radius of exposure pursuant to this Section.

b. If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person, operator or facility shall provide the results of the radius of exposure determinations to the division within 180 days of commencing operations or, for existing facilities, within 180 days of the effective date of this Section, unless extended for good cause by the Director. ~~Operators shall have the right to petition the Division for an extension of this 180 day reporting period.~~ The division may disapprove the test methodology and require additional testing if the test methodology did not conform to the requirements of this Section.

4. Recalculation. If operational or production alterations are made that, through application of generally accepted engineering principles and generally accepted operating practices, indicate that a 25% or greater increase in the hydrogen sulfide concentration may occur in a given operation or facility, the person, operator or facility shall recalculate the radius of exposure and submit the results to the division.

E. H_2S Contingency Plan.

1. In General. The H_2S contingency plan is a written document that provides a plan of action that will be used to alert and protect persons at risk in the event of a potentially significant release of hydrogen sulfide gas.

2. When Required. An H_2S contingency plan must be prepared whenever a potentially hazardous volume of hydrogen sulfide may be present.

3. ~~3.~~ Input From Emergency Response Authorities and the Division. The person, operator or facility shall develop the H_2S contingency plan in accordance with the following sections. The opportunity for input to this plan shall be offered to the Division, the NM Department of Public Safety, and/or to other appropriate authorities as needed.

[Steve said that he could work on this section to make it work]

4. Elements. The H_2S contingency plan shall consist of different elements depending on the risks present.

a. Elements Required for Each Plan:

i. A detailed description of each action to be taken in the event of a release of a potentially hazardous volume of hydrogen sulfide, including an immediate action plan that substantially conforms to paragraph 7.6 of guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, most recent edition;

ii. A call list including the following as applicable:

aa. local supervisory personnel;
bb. county sheriff;
cc. the department of public safety and state police;
dd. city or municipal police;
ee. the appropriate division district office; and
ff. other public agencies as appropriate.

iii. A plat or map detailing the area within the radius of exposure of a potentially hazardous volume; and

iv. A list of the names and telephone numbers of all personnel to be contacted when a release is reported or suspected.

b. Where the 500-ppm radius of exposure encompasses any public road, the person, operator or facility shall include the following additional elements in the H_2S contingency plan:

i. Instructions and procedures for alerting and coordinating with emergency response authorities in the event of a release of a potentially hazardous volume of hydrogen sulfide at any public road;

ii. A plat or map detailing the area of exposure, including the locations of public roads within the radius of exposure of a potentially hazardous volume;

iii. A plan to divert traffic and safely get existing traffic off the road and out of danger.

c. Where the 100-ppm radius of exposure encompasses any public area, the following additional elements shall be included in the H_2S contingency plan:

i. detailed plans of action to alert and protect persons in the event of a release of a potentially hazardous volume of hydrogen sulfide, including instructions and procedures for alerting persons at risk and emergency response authorities in the event of a release of a potentially hazardous volume of hydrogen sulfide;

ii. a call list including all the persons set forth in Sub subparagraph E(4)(a)(ii), above, and the following:

aa. ambulance services;
bb. hospitals;
cc. county and city fire departments;
dd. doctors;
ee. contractors for supplemental or emergency equipment; and

ff. other public agencies as appropriate.

iii. a statement describing how emergency response actions will be coordinated with the division and the New Mexico state police, consistent with the New Mexico hazardous materials emergency response plan (HMER);

iv. a plat or map detailing the area of exposure, including the locations of private dwellings or residences, public facilities such as schools, businesses, public roads or other similar areas where the public may be reasonably expected to be present within the radius of exposure;

v. the names and telephone numbers of all persons living within the radius of exposure of 100 ppm hydrogen sulfide and contact persons for each public area, such as churches, schools and businesses; reasonable efforts will be made to keep this list current;

vi. provisions for advance briefing of affected and responsible persons within the radius of exposure. Such advance briefing shall include the hazards and characteristics of hydrogen sulfide, the necessity for an H_2S contingency plan, the possible sources of hydrogen sulfide within the radius of exposure, instructions for reporting a gas leak, the manner in which persons will be notified in the event of an emergency and steps to be taken in an emergency; ~~and~~

vii. ~~vii.~~ In the event that the operator believes that the population density and occupancy make it unreasonable to prepare a call list, a reaction type of plan (e.g., siren) may be proposed in lieu of the call list and advanced public notification, if approved by the Divison; and

viii. additional support information, if applicable, such as the location of emergency evacuation routes, the location of safety and life support equipment, the location of hydrogen sulfide containing facilities, the location of nearby telephones or other means of communication and special instructions for conditions at a particular installation such as local terrain and the effect of various weather conditions.

d. Additional Requirements. The division may impose additional requirements or modify requirements based on site-specific conditions, population density or special circumstances.

5. Submission. The H_2S contingency plan shall be submitted to the division and made available to the local emergency planning committee no later than 180 days following submission of the radius of exposure required in Subsection D of this Section. The H_2S contingency plan may be submitted separately or along with the application for permit to drill (APD).

6. Failure to Submit Plan. Failure to submit an H_2S contingency plan when required may result in denial of an application for permit to drill that well, , cancellation of an allowable for that well or the applicable lease, or other appropriate enforcement action.

7. Annual Review, Amendment. The person, operator or facility shall review the H_2S contingency plan on an annual basis or earlier if activation of a plan reveals a deficiency. The person, operator or facility shall submit any amendments to the division and, where applicable, to the local emergency planning committee.

8. Retention and On-Site Inspection. An H_2S contingency plan shall be reasonably accessible in the event of a release and maintained on file at all times and shall be available for inspection by the Division ~~during normal business hours~~.

9. Activation Levels. The H_2S contingency plan shall be activated in the event of a release of a potentially hazardous volume of H_2S above the respective thresholds (i.e. 500 ppm radius at any public road, 100 ppm radius at any public area, etc.) or if a sustained concentration of H_2S exceeds 50 ppm at the property line of any facility, well or operation.

F. Protection from Hydrogen Sulfide During Drilling, Workover and Servicing Operations.

1. API Standards. All drilling, completion, workover and well servicing operations shall be conducted with due consideration to the guidelines published by the API entitled "Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide," RP-68,

and "Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide," RP-49, most recent edition.

2. Minimum Standards. At a minimum, and possibly in addition to the foregoing API standards, each drilling, completion, workover and well servicing operation shall also be conducted in accordance with the following:

a. Before Commencing Operations. The person, operator or facility shall complete an H_2S contingency plan, where required, before commencement of operations. In addition, hydrogen sulfide training shall be completed before commencement of operations.

b. Egress Routes. The person, operator or facility shall maintain a passable egress route at all times during operations.

c. Detection, ~~and~~ Monitoring, and Safety Equipment. The person, operator or facility shall provide hydrogen sulfide detection, ~~and~~ monitoring, and safety equipment as follows:

i. Each drilling and completion site shall have a hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the ambient air concentration of hydrogen sulfide reaches a level not to exceed20 ppm. There shall be a sensing point located at the shale shaker, rig floor and bell nipple for a drilling site and the cellar, rig floor and circulating tanks or shale shaker for a completion site.

ii. The detection system shall be calibrated, ~~and~~ tested, and recorded monthly.

iii. For workover and well servicing operations, one operational sensing point shall be located as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.

iv. Hydrogen sulfide detection, ~~and~~ monitoring, and safety equipment must be provided and operational during drilling when drilling is within 500 feet of the zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling. Detection and monitoring equipment is not required for drilling from the surface to within 500 feet of the zone anticipated to contain hydrogen sulfide.

d. Wind Indicators and Signs.

i. Equipment to indicate wind direction shall be present and visible at all times. At least two devices to indicate wind direction shall be installed at separate elevations and visible from all principal working areas at all times.

ii. Danger or caution signs shall be displayed along all accesses to the site. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" and in smaller lettering: "Do Not Approach If Red Flag is Flying" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The signs shall be legible and large enough to be read by all persons entering the well site and shall be placed at a location which allows vehicles to turn around at a safe distance prior to reaching the site.

iii. When the sustained concentration of hydrogen sulfide is detected above 20 ppm at any detection point, red flags shall be displayed.

e. Hydrogen Sulfide Encountered During Operations. If hydrogen sulfide was not anticipated at the time the division approved the APD but is encountered during drilling in excess of 100 ppm in the gaseous mixture, the operator shall immediately ensure control of the well, suspend drilling operations unless detrimental to well control, and obtain materials and safety equipment to bring the operations into compliance with this Section. The operator shall notify the division of the event and the mitigating steps that have or are being taken as soon as possible, but no later than 24 hours following discovery.

3. Operating Practices In Hydrogen Sulfide Concentrations of 100 ppm or Greater. Operating practices in areas known to contain a concentration of hydrogen sulfide gas of 100 ppm or greater in the gaseous mixture shall be subject to the following requirements:

a. If Hydrogen Sulfide Is Encountered During Use of Air, Gas, Mist or Other Non-Mud Circulating Media. If hydrogen sulfide gas in excess of 100 ppm is encountered while drilling with air, gas, mist or other non-mud circulating mediums for aerated mud, the well shall be killed with a water- or oil-based mud, and mud shall be used thereafter as the circulating medium for continued drilling. Alternative drilling methods may be used if approved by the division.

b. Flare System. For drilling and completion operations, the person, operator or facility shall install a flare system to safely gather and burn hydrogen sulfide-bearing gas, unless exempted pursuant to Subsection K. Flare outlets shall be located as far from the well bore as feasible but not less than 150 feet from the well. Flare lines shall be as straight as practical. The flare system shall be equipped with a suitable and safe means of ignition~~.~~, but ~~W~~where noncombustible gas is to be flared, the system shall be provided supplemental fuel to maintain ignition.

c. Remote Controlled Choke. When the 100 ppm Radius of Exposure includes a public area, except where exempt pursuant to Subsection K, the following must be done:

i. The person, operator or facility shall install a remote controlled choke during drilling and during completion and well servicing operations when the 100-ppm H_2S radius of exposure includes a public area~~, unless exempted pursuant to Subsection K~~.

ii. ~~A remote controlled valve may be used in lieu of use of a remote controlled choke, but only for completion operations~~For completion or workover operations, a suitable alternative to a remote choke (e.g., remote controlled valve, BOP with remote accumulator, etc.) may be used;.

iii. A remote controlled choke or remote controlled valve shall have, at a minimum, a pressure and hydrogen sulfide-rated well control choke and kill system including manifold and blowout preventer pursuant to specifications API-16C and API-RP 53. Where possible, the blowout preventer stack shall have at least one spool for the kill and choke lines, two pipe rams, one blind ram, one annular device and a rotating head. Mud-gas separators shall also be used. These systems shall be tested and maintained pursuant to the specifications referenced or other division rules, if more stringent. Variations to blowout preventer stack arrangements may be granted by the division for good cause shown.

d. Mud Program. A mud program, including de-gassing and flaring, capable of handling H_2S conditions and well control shall be used.

e. Well Testing. Except with prior approval by the division, the drill-stem testing shall be conducted only during daylight hours and formation fluids shall not be permitted to flow to the surface (closed chamber only). An operator shall notify the division 24 hours in advance of a drill-stem test if an H_2S contingency plan is required pursuant to this Section.

G. Protection from Hydrogen Sulfide at Crude Oil Pump Stations, Producing Wells, Tank Batteries and Associated Production Facilities, Refineries, Gas Plants and Compressor Stations.

1. API Standards. Operations at crude oil pump stations and producing wells, tank batteries and associated production facilities shall be conducted with due consideration to the guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, latest edition.

2. Minimum Standards. At a minimum, production from wells and operation of tank batteries and associated production equipment shall also be conducted in accordance with the following Subparagraphs and Sub subparagraphs. Where API standards referred to in the previous paragraph are less stringent than the following, the more stringent standards shall apply.

a. Gaseous Mixtures Containing 100 ppm or more. Producing wells containing 100 ppm or more of hydrogen sulfide in the gaseous mixture, tank batteries and associated production facilities at such sites, shall be subject to the following:

i. H_2S Contingency Plan. If the radius of exposure calculated pursuant to Subsection D can reach the designated thresholds (i.e., 100 ppm in public areas and 500 ppm on public roads), an H_2S contingency plan shall be required.

ii. Signage. A danger sign or signs shall be posted within 50 feet of each facility to alert the public of the potential hydrogen sulfide danger. If fenced, a danger sign at the gates shall suffice. Danger signs shall be posted at each flow line and gathering line on the well pad that

contains hydrogen sulfide gas. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The signs shall be legible and large enough to be read by all persons entering the well site. A sign shall be placed at each point where a flow line or gathering line crosses a public road. Each sign shall be legible and shall contain the name of the owner or operator and an emergency telephone number.

iii. Fencing. Fencing and gates shall be required when producing wells, associated tank batteries and associated production facilities are located within a 1/4-mile of a public area. The fence shall consist of a 5-foot chain link topped by two stands of barbed wire or other designs approved by the division. Gates shall be locked when unattended.

iv. Wind Direction Indicators. Wind direction indicators shall be required at every facility (tank battery, water injection station, production satellite) where H_2S concentration in a gaseous state exceeds 100 PPM.

v. Secondary Well Control. Wells where the 100-ppm H_2S radius of exposure incorporates a public area shall possess a secondary means of immediate well control through the use of appropriate christmas tree or downhole completion equipment. Such equipment shall allow downhole accessibility (reentry) under pressure for permanent well control operations.

vi. Automatic Safety Valve or Shutdown. If the 100-ppm radius of exposure involves a public area, the person, operator or facility shall install an automatic safety valve or shutdown at the facility or wellhead or shall install other appropriate shut-in control. The automatic safety valve shall be set to activate upon a release of a potentially hazardous volume of hydrogen sulfide.

b. Tanks or vessels containing 300 ppm or more of hydrogen sulfide in the gaseous mixture shall be subject to the following additional requirements:

1. Each stair or ladder leading to the top of any storage tank shall be chained or marked to restrict entry. For any tank battery that requires fencing pursuant to this Section, a danger sign posted at the gates may be substituted for chaining and signs.

2. The person, operator or facility shall post a danger sign on or within 50 feet of any storage tank to alert persons of the potential hydrogen sulfide danger. For any storage tank for which fencing is required, a danger sign posted at the locked gates shall suffice. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The sign(s) shall be legible and large enough to be read by all persons entering the site.

4. Compliance Schedule. Each existing producing well and associated tank battery not currently meeting the requirements and minimum standards set forth herein shall be brought into compliance within one year of the effective date of this Section. Each producing well and tank battery constructed following the effective date of this Section shall be designed, constructed and operated to meet the requirements set forth herein.

H. Personnel Protection and Training. All persons responsible for the implementation of any H_2S contingency plan shall be provided training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.

I. Standards for Equipment That May Be Exposed to Hydrogen Sulfide. Persons, operators and facilities shall chose equipment with consideration for both the H_2S working environment and anticipated stresses. NACE Standard MR0175 (latest edition) shall be considered when making for metallic equipment selection or, if applicable, adequate protection by chemical inhibition or other methods that controls or limits the corrosive effects of H_2S shall be used.

J. Hydrogen Sulfide Injection. Injection of fluids containing hydrogen sulfide where the injection fluids are a gaseous mixture, or would be a gaseous mixture in the event of a release to the

atmosphere, and where the 100-ppm radius of exposure includes any public area, shall not be permitted unless first approved by the division after public hearing. Injection facilities and projects that are permitted as of the effective date of this Section are exempt from the provisions of this subsection. Expansions of permitted projects do not need a public hearing.

K. Exemptions. An exemption to the requirements of this Section may be granted by petitioning the director. Any such petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the public safety will be protected. The director, after considering all relevant factors, may approve an exemption if the circumstances warrant an exemption, if the requirements of this Section are met, and public safety will be protected.

L. Release. Upon a release of hydrogen sulfide the following actions must be taken:

1. Activation of the H_2S contingency plan. The person, operator or facility shall activate the H_2S contingency plan immediately upon an H_2S release where the potential exists for public exposure to a potentially hazardous volume of H_2S, or where a sustained concentration of H_2S greater than 50 ppm exists at the property line of any well, facility or operation.

2. Notification of the Division. The person, operator or facility shall notify the division upon a release of hydrogen sulfide requiring activation of the H_2S contingency plan as soon as practicable, preferably within one hour of discovery of the release or as soon as possible in cases where prompt response should supercede notification. The person, operator or facility shall submit a full report of the incident to the division on Form C-141 no later than fifteen (15) days following the release.

M. ~~Additional Standards~~Corrective Actions. The division may require more stringent standards on a case-by-case basis than those set forth in this Section, or require corrective actions if necessary, to maintain control of a well or any other facility or to safeguard public safety.

Ross, Stephen

From: Deborah Seligman [seligman@nmoga.org]
Sent: Tuesday, April 16, 2002 3:17 PM
To: sross@state.nm.us
Subject: Fwd: Proposed RMP Exemption Language For OCD H2S Draft Rule

From: Dave Pavlich <dpavlich@giant.com>
To: "Deborah Seligman (E-mail)" <seligman@nmoga.org>
Cc: "Phil Youngblood (E-mail)" <Phil@navajo-refining.com>
Subject: Proposed RMP Exemption Language For OCD H2S Draft Rule
Date: Tue, 16 Apr 2002 13:52:38 -0700
X-Mailer: Internet Mail Service (5.5.2653.19)

Deborah:

On behalf of the entire New Mexico refining industry, we would like to submit the following proposed wording for dealing with an RMP exemption to the OCD's draft H2S rule:

"Facilities subject to the EPA's Risk Management Program (RMP) rule under 40 CFR Part 68 for regulated toxic substances, as defined therein, are exempt from the requirements of this Rule."

We believe that this exemption will prevent double regulation of the subject facilities since hydrogen sulfide is one of the substances addressed under the RMP. The RMP rule covers in detail various aspects of off-site release prevention and mitigation such as Hazard Assessment, Release Prevention, and Emergency Response.

Language which merely indicates that the Rule is not intended to supercede other Federal regulations is not adequate since compliance with the OCD's rule could still be required without technically "superceding" or replacing other Federal regulations - it would merely be "adding to" rather than "supplanting" those regulations. The above proposed language makes the appropriate exemption much less subject to misinterpretation. Both sets of language can certainly be included if desired.

Thanks.

Dave

Ross, Stephen

From: Deborah Seligman [seligman@nmoga.org]
Sent: Tuesday, April 16, 2002 3:30 PM
To: sross@state.nm.us
Subject: Fwd: FW:Revision to Proposed RMP Exemption Language For OCD H2S Draft Rule

Stephen . . . it didn't take long for them to change language . . . and I will check with the gas processing plants . . .

From: Dave Pavlich <dpavlich@giant.com>
To: "Deborah Seligman (E-mail)" <seligman@nmoga.org>
Cc: "Phil Youngblood (E-mail)" <Phil@navajo-refining.com>
Subject: FW:Revision to Proposed RMP Exemption Language For OCD H2S Draft Rule
Date: Tue, 16 Apr 2002 14:18:39 -0700
X-Mailer: Internet Mail Service (5.5.2653.19)

Deborah:

Phil and I chatted further and want to change the proposed wording slightly to read as follows: "Facilities subject to the EPA's Risk Management Program (RMP) rule under 40 CFR Part 68 are exempt from the requirements of this Rule."

This leaves a clearer path for gas plants to take advantage of this exemption as well.
Thanks.
Dave

-----Original Message-----
From: Dave Pavlich
Sent: Tuesday, April 16, 2002 2:53 PM
To: Deborah Seligman (E-mail)
Cc: Phil Youngblood (E-mail)
Subject: Proposed RMP Exemption Language For OCD H2S Draft Rule

Deborah:

On behalf of the entire New Mexico refining industry, we would like to submit the following proposed wording for dealing with an RMP exemption to the OCD's draft H2S rule:

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Thanks.

Dave

Ross, Stephen

From: Deborah Seligman [seligman@nmoga.org]
Sent: Monday, April 15, 2002 4:38 PM
To: seligman@nmoga.org
Cc: gallagher@nmoga.org; rcanderson@state.nm.us; sross@state.nm.us; WPrice@state.nm.us
Subject: Fwd: Updated Draft of H2S Standard

Attached is an updated *draft H2S Rule* from Bruce Gantner. The notes were taken at our meeting with Wayne Price, Roger Anderson and Steve Ross from OCD on Thursday, April 11. I will circulate Steve's changes once they are received.

Based upon my notes, here is the latest version of the NMOCD H2S Standard. There were some sections that Steve was going to work on so those are not included.

Bruce Gantner
Burlington Resources
San Juan Division
Phone: 505/326-9842
FAX: 505/599-4005
email: bgantner@br-inc.com

DISCUSSION DRAFT, ~~3-14-02~~ 04-15-02
RULE: 19.15.__.____ Hydrogen Sulfide Gas (Hydrogen Sulfide)

OUTLINE:

A. In General.
B. Applicability
C. Definitions
    1. ANSI
    2. API
    3. ASTM
    4. Dispersion Technique
    5. Escape Rate
    6. GPA
    7. LEPC
    8. NACE
    9. PPM
    10. Potentially Hazardous Volume
    11. Public Area
    12. Public Road
    13. Radius of Exposure
D. Determination of Hydrogen Sulfide Risk
    1. Determination of Hydrogen Sulfide Concentration
    2. Tested Concentrations Below 100 ppm
    3. Tested Concentrations Above 100 ppm; Calculation of the Radius of Exposure
    4. Recalculation
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    1. In General
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    4. Elements
    5. Submission
    6. Failure to Submit Plan
    7. Annual Review, Amendment
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    9. Activation Levels
F. Protection from Hydrogen Sulfide During Drilling, Workover and Servicing Operations.
    1. API Standards
    2. Minimum Standards
    3. Operating Practices In Hydrogen Sulfide Concentrations of 100 ppm or Greater
G. Protection from Hydrogen Sulfide at Producing Wells, Tank Batteries etc.
    1. API Standards
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    4. Compliance Schedule
H. Personnel Protection and Training
I. Standards for Equipment That May Be Exposed to Hydrogen Sulfide
J. Hydrogen Sulfide Injection
K. Exemptions
L. Release
    1. Activation of the H_2S Contingency Plan
    2. Notification of the Division
M. Additional Standards

19.15.__.__ Hydrogen Sulfide Gas (Hydrogen Sulfide)

A. In General. Hydrogen sulfide gas (known by its chemical abbreviation " H_2S" or as "sulfurated hydrogen" or "hydrosulfuric acid") is a flammable, poisonous gas that may occur naturally as a component of crude petroleum and natural gas. The gas has a distinct and characteristic odor of rotten eggs but due to olfactory fatigue may not be sensed by the human sense of smell.

B. Scope. This Section provides for public safety in areas where hydrogen sulfide gas, H_2S is in concentrations greater than listed below. This Section applies to any person, operator or facility subject to the jurisdiction of the Division, including, but not limited to, any person, operator or facility engaged in drilling, stimulating, completing, working over or producing any oil, natural gas or carbon dioxide well or any person, operator or facility engaged in gathering, transporting, storing, processing or refining of crude oil, natural gas or carbon dioxide.

C. Definitions (specific to this Section).

1. ANSI. The acronym "ANSI" means the american national standard institute.
2. API. The acronym "API" means the american petroleum institute.
3. ASTM. The acronym "ASTM" means the american society for testing and materials.
4. Dispersion Technique. A "dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of H_2S gas in the atmosphere.
5. Escape Rate. The "escape rate" is the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing H_2S. The escape rate is calculated using the maximum daily rate of the gaseous mixture produced or the best estimate thereof. For a natural gas well, the escape rate shall be calculated by using the current daily absolute open flow rate against atmospheric pressure. For an oil well, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or best estimate thereof. For an oil or natural gas well drilled in an undeveloped area, a wildcat well, the escape rate may be determined by using offset wells completed in the interval in question, or using some other reasonable means to calculate the escape rate. For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of gaseous mixture through the facility or operation.
6. GPA. The acronym "GPA" means the gas processors association.
7. LEPC. The acronym "LEPC" means the local emergency planning committee established pursuant to the emergency planning and community right-to-know act, 42 U.S. C. § 11001.
8. NACE. The acronym "NACE" refers to the national association of corrosion engineers.
9. PPM. The acronym "ppm" means "parts per million." by volume.
10. Potentially Hazardous Volume (hereinafter referred to as a "potentially hazardous volume" or by the acronym "PHV") means the volume of hydrogen sulfide gas of such concentration that:
    a. the 100 ppm radius of exposure includes any public area as defined herein;
    b. the 500 ppm radius of exposure includes any public road as defined herein; or
    c. the 100 ppm radius of exposure is in excess of 3,000 feet.
11. Public Area. A "public area" is any dwelling; office; place of business; church; school; hospital; school bus stop; government building; or any portion of a park, or other similar ~~populated~~ area where the public may reasonably be expected to frequent, but does not include facilities directly involved in oil and gas production, such as producing oil and gas wells, pipelines, tank batteries, production equipment, gas plants, refineries.
12. Public Road. A "public road" is any road or highway that is under the jurisdiction of a federal, state, county, or municipal government for maintenance or public use.. A public road is not a private road, two track, ranch, or oil and gas lease road.
13. Radius of Exposure. The radius of exposure (hereinafter referred to as "radius of exposure" or "ROE") is an imaginary circle constructed around a point of escape the radius of which is calculated using the following Pasquill-Gifford derived equation, or by such other method as may be approved by the division:

a. For determining the 100-ppm radius of exposure: X= [(1.589)(hydrogen sulfide concentration)(Q)] $^{(0.6258)}$, or

b. For determining the 500-ppm radius of exposure: X=[(0.4546)(hydrogen sulfide concentration)(Q)]$^{(0.6258)}$

Where: X= radius of exposure in feet: hydrogen sulfide concentration = decimal equivalent of the mole or volume fractions of hydrogen sulfide in the gaseous mixture; Q= maximum volume of gas determined to be available for escape in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

c. As an alternative for determining either the 100 ppm or the 500 ppm radius of exposures, a dispersion technique that takes into account representative wind speed, direction, atmospheric stability, complex terrain and other dispersion features may be utilized in lieu of the above Pasquill Gifford equations. Such techniques may include, but shall not be limited to, one of a series of computer models outlined in the environmental protection agency's "Guidelines on Air Quality Models (EPA-450/2-78-027R)."

d. Where multiple sources of hydrogen sulfide are present (e.g. wells, treatment equipment, flow lines, etc.), the radius of exposure may encompass a larger area than would otherwise be calculated using a radius of exposure computation for each component part.

e. For a well being drilled in an area where insufficient data exits to calculate a radius of exposure, but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100 ppm radius of exposure equal to 3,000 feet shall be assumed.

D. Determination of Hydrogen Sulfide Risk.

1. Determination of Hydrogen Sulfide Concentration.

a. Each person, operator or facility to which this Section applies shall determine the hydrogen sulfide concentration within each of its operations or systems. A representative sample for each system or operation may be used for testing provided that the person, operator or facility can demonstrate that the concentration derived from a test of the representative sample is reasonably representative of the hydrogen sulfide concentration within the operation or system.

b. ~~b.~~ The tests referred to in the previous Subparagraph shall be conducted in accordance with applicable ASTM and GPA standards or by other methods approved by the division.

c. Tests conducted prior to the effective date of this Section may be utilized to satisfy this requirement, provided that the method used meets D.1.b above.

2. Tested Concentrations Below 100 ppm. If the testing described in the previous Paragraph determines that the hydrogen sulfide concentration in a given operation or system is less than 100 ppm, no further actions are required pursuant to this Section.

3. Tested Concentrations Above 100 ppm; Calculation of the Radius of Exposure.

a. If the testing described in Paragraph 1 of this Subsection determines that the concentration of hydrogen sulfide in a gaseous mixture is 100 ppm or greater, then the person, operator or facility must calculate the radius of exposure pursuant to this Section.

b. If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person, operator or facility shall provide the results of the radius of exposure determinations to the division within 180 days of commencing operations or, for existing facilities, within 180 days of the effective date of this Section, unless extended for good cause by the Director. ~~Operators shall have the right to petition the Division for an extension of this 180 day reporting period.~~ The division may disapprove the test methodology and require additional testing if the test methodology did not conform to the requirements of this Section.

4. Recalculation. If operational or production alterations are made that, through application of generally accepted engineering principles and generally accepted operating practices, indicate that a 25% or greater increase in the hydrogen sulfide concentration may occur in a given operation or facility, the person, operator or facility shall recalculate the radius of exposure and submit the results to the division.

E. H_2S Contingency Plan.

1. In General. The H_2S contingency plan is a written document that provides a plan of action that will be used to alert and protect persons at risk in the event of a potentially significant release of hydrogen sulfide gas.

2. When Required. An H_2S contingency plan must be prepared whenever a potentially hazardous volume of hydrogen sulfide may be present.

3. ~~3.~~ Input From Emergency Response Authorities and the Division. The person, operator or facility shall develop the H_2S contingency plan in accordance with the following sections. The opportunity for input to this plan shall be offered to the Division, the NM Department of Public Safety, and/or to other appropriate authorities as needed.

[Steve said that he could work on this section to make it work]

4. Elements. The H_2S contingency plan shall consist of different elements depending on the risks present.

a. Elements Required for Each Plan:

i. A detailed description of each action to be taken in the event of a release of a potentially hazardous volume of hydrogen sulfide, including an immediate action plan that substantially conforms to paragraph 7.6 of guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, most recent edition;

ii. A call list including the following as applicable:

aa. local supervisory personnel;
bb. county sheriff;
cc. the department of public safety and state police;
dd. city or municipal police;
ee. the appropriate division district office; and
ff. other public agencies as appropriate.

iii. A plat or map detailing the area within the radius of exposure of a potentially hazardous volume; and

iv. A list of the names and telephone numbers of all personnel to be contacted when a release is reported or suspected.

b. Where the 500-ppm radius of exposure encompasses any public road, the person, operator or facility shall include the following additional elements in the H_2S contingency plan:

i. Instructions and procedures for alerting and coordinating with emergency response authorities in the event of a release of a potentially hazardous volume of hydrogen sulfide at any public road;

ii. A plat or map detailing the area of exposure, including the locations of public roads within the radius of exposure of a potentially hazardous volume;

iii. A plan to divert traffic and safely get existing traffic off the road and out of danger.

c. Where the 100-ppm radius of exposure encompasses any public area, the following additional elements shall be included in the H_2S contingency plan:

i. detailed plans of action to alert and protect persons in the event of a release of a potentially hazardous volume of hydrogen sulfide, including instructions and procedures for alerting persons at risk and emergency response authorities in the event of a release of a potentially hazardous volume of hydrogen sulfide;

ii. a call list including all the persons set forth in Sub subparagraph E(4)(a)(ii), above, and the following:

aa. ambulance services;
bb. hospitals;
cc. county and city fire departments;
dd. doctors;
ee. contractors for supplemental or emergency equipment; and

ff. other public agencies as appropriate.

iii. a statement describing how emergency response actions will be coordinated with the division and the New Mexico state police, consistent with the New Mexico hazardous materials emergency response plan (HMER);

iv. a plat or map detailing the area of exposure, including the locations of private dwellings or residences, public facilities such as schools, businesses, public roads or other similar areas where the public may be reasonably expected to be present within the radius of exposure;

v. the names and telephone numbers of all persons living within the radius of exposure of 100 ppm hydrogen sulfide and contact persons for each public area, such as churches, schools and businesses;

vi. provisions for advance briefing of affected and responsible persons within the radius of exposure. Such advance briefing shall include the hazards and characteristics of hydrogen sulfide, the necessity for an H_2S contingency plan, the possible sources of hydrogen sulfide within the radius of exposure, instructions for reporting a gas leak, the manner in which persons will be notified in the event of an emergency and steps to be taken in an emergency; and

vii. ~~vii.~~ additional support information, if applicable, such as the location of emergency evacuation routes, the location of safety and life support equipment, the location of hydrogen sulfide containing facilities, the location of nearby telephones or other means of communication and special instructions for conditions at a particular installation such as local terrain and the effect of various weather conditions.

viii. In the event that the operator believes that the population density and occupancy make it unreasonable to prepare a call list, a reaction type of plan (e.g., siren) may be proposed in lieu of the call list and advanced public notification, if approved by the Divison.

d. Additional Requirements. The division may impose additional requirements or modify requirements based on site-specific conditions, population density or special circumstances.

5. Submission. The H_2S contingency plan shall be submitted to the division and made available to the local emergency planning committee no later than 180 days following submission of the radius of exposure required in Subsection D of this Section. The H_2S contingency plan may be submitted separately or along with the application for permit to drill (APD).

6. Failure to Submit Plan. Failure to submit an H_2S contingency plan when required may result in denial of an application for permit to drill that well, , cancellation of an allowable for that well or the applicable lease, or other appropriate enforcement action.

7. Annual Review, Amendment. The person, operator or facility shall review the H_2S contingency plan on an annual basis or earlier if activation of a plan reveals a deficiency. The person, operator or facility shall submit any amendments to the division and, where applicable, to the local emergency planning committee.

8. Retention and On-Site Inspection. An H_2S contingency plan shall be reasonably accessible in the event of a release and maintained on file at all times and shall be available for inspection by the Division ~~during normal business hours~~.

9. Activation Levels. The H_2S contingency plan shall be activated in the event of a release of a potentially hazardous volume of H_2S above the respective thresholds (i.e. 500 ppm radius at any public road, 100 ppm radius at any public area, etc.) or if a sustained concentration of H_2S exceeds 50 ppm at the property line of any facility, well or operation.

F. Protection from Hydrogen Sulfide During Drilling, Workover and Servicing Operations.

1. API Standards. All drilling, completion, workover and well servicing operations shall be conducted with due consideration to the guidelines published by the API entitled "Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide," RP-68,

and "Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide," RP-49, most recent edition.

2. Minimum Standards. At a minimum, and possibly in addition to the foregoing API standards, each drilling, completion, workover and well servicing operation shall also be conducted in accordance with the following:

a. Before Commencing Operations. The person, operator or facility shall complete an H_2S contingency plan, where required, before commencement of operations. In addition, hydrogen sulfide training shall be completed before commencement of operations.

b. Egress Routes. The person, operator or facility shall maintain a passable egress route at all times during operations.

c. Detection, ~~and~~ Monitoring, and Safety Equipment. The person, operator or facility shall provide hydrogen sulfide detection, ~~and~~ monitoring, and safety equipment as follows:

i. Each drilling and completion site shall have a hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the ambient air concentration of hydrogen sulfide reaches a level not to exceed20 ppm. There shall be a sensing point located at the shale shaker, rig floor and bell nipple for a drilling site and the cellar, rig floor and circulating tanks or shale shaker for a completion site.

ii. The detection system shall be calibrated, ~~and~~ tested, and recorded monthly.

iii. For workover and well servicing operations, one operational sensing point shall be located as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.

iv. Hydrogen sulfide detection, ~~and~~ monitoring, and safety equipment must be provided and operational during drilling when drilling is within 500 feet of the zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling. Detection and monitoring equipment is not required for drilling from the surface to within 500 feet of the zone anticipated to contain hydrogen sulfide.

d. Wind Indicators and Signs.

i. Equipment to indicate wind direction shall be present and visible at all times. At least two devices to indicate wind direction shall be installed at separate elevations and visible from all principal working areas at all times.

ii. Danger or caution signs shall be displayed along all accesses to the site. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" and in smaller lettering: "Do Not Approach If Red Flag is Flying" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The signs shall be legible and large enough to be read by all persons entering the well site and shall be placed at a location which allows vehicles to turn around at a safe distance prior to reaching the site.

iii. When sustained the concentration of hydrogen sulfide is detected above 20 ppm at any detection point, red flags shall be displayed.

e. Hydrogen Sulfide Encountered During Operations. If hydrogen sulfide was not anticipated at the time the division approved the APD but is encountered during drilling in excess of 100 ppm in the gaseous mixture, the operator shall immediately ensure control of the well, suspend drilling operations unless detrimental to well control, and obtain materials and safety equipment to bring the operations into compliance with this Section. The operator shall notify the division of the event and the mitigating steps that have or are being taken as soon as possible, but no later than 24 hours following discovery.

3. Operating Practices In Hydrogen Sulfide Concentrations of 100 ppm or Greater. Operating practices in areas known to contain a concentration of hydrogen sulfide gas of 100 ppm or greater in the gaseous mixture shall be subject to the following requirements:

a. If Hydrogen Sulfide Is Encountered During Use of Air, Gas, Mist or Other Non-Mud Circulating Media. If hydrogen sulfide gas in excess of 100 ppm is encountered while drilling with air, gas, mist or other non-mud circulating mediums for aerated mud, the well shall be killed with a water- or oil-based mud, and mud shall be used thereafter as the circulating medium for continued drilling. Alternative drilling methods may be used if approved by the division.

b. Flare System. For drilling and completion operations, the person, operator or facility shall install a flare system to safely gather and burn hydrogen sulfide-bearing gas, unless exempted pursuant to Subsection K. Flare outlets shall be located as far from the well bore as feasible but not less than 150 feet from the well. Flare lines shall be as straight as practical. The flare system shall be equipped with a suitable and safe means of ignition. Where noncombustible gas is to be flared, the system shall be provided supplemental fuel to maintain ignition.

c. Remote Controlled Choke. When the 100 ppm Radius of Exposure includes a public area, except where exempt pursuant to Subsection K, the following must be done:

i. The person, operator or facility shall install a remote controlled choke during drilling and during completion and well servicing operations when the 100-ppm H_2S radius of exposure includes a public area~~, unless exempted pursuant to Subsection K~~.

ii. ~~A remote controlled valve may be used in lieu of use of a remote controlled choke, but only for completion operations~~For completion or workover operations, a suitable alternative to a remote choke (e.g., remote controlled valve, BOP with remote accumulator, etc.) may be used;.

iii. A remote controlled choke or remote controlled valve shall have, at a minimum, a pressure and hydrogen sulfide-rated well control choke and kill system including manifold and blowout preventer pursuant to specifications API-16C and API-RP 53. Where possible, the blowout preventer stack shall have at least one spool for the kill and choke lines, two pipe rams, one blind ram, one annular device and a rotating head. Mud-gas separators shall also be used. These systems shall be tested and maintained pursuant to the specifications referenced or other division rules, if more stringent. Variations to blowout preventer stack arrangements may be granted by the division for good cause shown.

d. Mud Program. A mud program, including de-gassing and flaring, capable of handling H_2S conditions and well control shall be used.

e. Well Testing. Except with prior approval by the division, the drill-stem testing shall be conducted only during daylight hours and formation fluids shall not be permitted to flow to the surface (closed chamber only). An operator shall notify the division 24 hours in advance of a drill-stem test if an H_2S contingency plan is required pursuant to this Section.

G. Protection from Hydrogen Sulfide at Crude Oil Pump Stations, Producing Wells, Tank Batteries and Associated Production Facilities, Refineries, Gas Plants and Compressor Stations.

1. API Standards. Operations at crude oil pump stations and producing wells, tank batteries and associated production facilities shall be conducted with due consideration to the guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, latest edition.

2. Minimum Standards. At a minimum, production from wells and operation of tank batteries and associated production equipment shall also be conducted in accordance with the following Subparagraphs and Sub subparagraphs. Where API standards referred to in the previous paragraph are less stringent than the following, the more stringent standards shall apply.

a. Gaseous Mixtures Containing 100 ppm or more. Producing wells containing 100 ppm or more of hydrogen sulfide in the gaseous mixture, tank batteries and associated production facilities at such sites, shall be subject to the following:

i. H_2S Contingency Plan. If the radius of exposure calculated pursuant to Subsection D can reach the designated thresholds (i.e., 100 ppm in public areas and 500 ppm on public roads), an H_2S contingency plan shall be required.

ii. Signage. A danger sign or signs shall be posted within 50 feet of each facility to alert the public of the potential hydrogen sulfide danger. If fenced, a danger sign at the gates shall suffice. Danger signs shall be posted at each flow line and gathering line on the well pad that

contains hydrogen sulfide gas. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The signs shall be legible and large enough to be read by all persons entering the well site. A sign shall be placed at each point where a flow line or gathering line crosses a public road. Each sign shall be legible and shall contain the name of the owner or operator and an emergency telephone number.

iii. Fencing. Fencing and gates shall be required when producing wells, associated tank batteries and associated production facilities are located within a 1/4-mile of a public area. The fence shall consist of a 5-foot chain link topped by two stands of barbed wire or other designs approved by the division. Gates shall be locked when unattended.

iv. Wind Direction Indicators. Wind direction indicators shall be required at every facility (tank battery, water injection station, production satellite) where H_2S concentration in a gaseous state exceeds 100 PPM.

v. Secondary Well Control. Wells where the 100-ppm H_2S radius of exposure incorporates a public area shall possess a secondary means of immediate well control through the use of appropriate christmas tree or downhole completion equipment. Such equipment shall allow downhole accessibility (reentry) under pressure for permanent well control operations.

vi. Automatic Safety Valve or Shutdown. If the 100-ppm radius of exposure involves a public area, the person, operator or facility shall install an automatic safety valve or shutdown at the facility or wellhead or shall install other appropriate shut-in control. The automatic safety valve shall be set to activate upon a release of a potentially hazardous volume of hydrogen sulfide.

b. Tanks or vessels containing 300 ppm or more of hydrogen sulfide in the gaseous mixture shall be subject to the following additional requirements:

1. Each stair or ladder leading to the top of any storage tank shall be chained or marked to restrict entry. For any tank battery that requires fencing pursuant to this Section, a danger sign posted at the gates may be substituted for chaining and signs.

2. The person, operator or facility shall post a danger sign on or within 50 feet of any storage tank to alert persons of the potential hydrogen sulfide danger. For any storage tank for which fencing is required, a danger sign posted at the locked gates shall suffice. The signs shall read "DANGER - POISON GAS", "DANGER - HYDROGEN SULFIDE", or, as appropriate "CAUTION - POISON GAS" or "CAUTION - HYDROGEN SULFIDE" or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration. The sign(s) shall be legible and large enough to be read by all persons entering the site.

4. Compliance Schedule. Each existing producing well and associated tank battery not currently meeting the requirements and minimum standards set forth herein shall be brought into compliance within one year of the effective date of this Section. Each producing well and tank battery constructed following the effective date of this Section shall be designed, constructed and operated to meet the requirements set forth herein.

H. Personnel Protection and Training. All persons responsible for the implementation of any H_2S contingency plan shall be provided training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.

I. Standards for Equipment That May Be Exposed to Hydrogen Sulfide. Persons, operators and facilities shall chose equipment with consideration for both the H_2S working environment and anticipated stresses. NACE Standard MR0175 (latest edition) shall be considered when making for metallic equipment selection or, if applicable, adequate protection by chemical inhibition or other methods that controls or limits the corrosive effects of H_2S shall be used.

J. Hydrogen Sulfide Injection. Injection of fluids containing hydrogen sulfide where the injection fluids are a gaseous mixture, or would be a gaseous mixture in the event of a release to the

atmosphere, and where the 100-ppm radius of exposure includes any public area, shall not be permitted unless first approved by the division after public hearing. Injection facilities and projects that are permitted as of the effective date of this Section are exempt from the provisions of this subsection. Expansions of permitted projects do not need a public hearing.

K. Exemptions. An exemption to the requirements of this Section may be granted by petitioning the director. Any such petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the public safety will be protected. The director, after considering all relevant factors, may approve an exemption if the circumstances warrant an exemption, if the requirements of this Section are met, and public safety will be protected.

L. Release. Upon a release of hydrogen sulfide the following actions must be taken:

1. Activation of the H_2S contingency plan. The person, operator or facility shall activate the H_2S contingency plan immediately upon an H_2S release where the potential exists for public exposure to a potentially hazardous volume of H_2S, or where a sustained concentration of H_2S greater than 50 ppm exists at the property line of any well, facility or operation.

2. Notification of the Division. The person, operator or facility shall notify the division upon a release of hydrogen sulfide requiring activation of the H_2S contingency plan as soon as practicable, preferably within one hour of discovery of the release or as soon as possible in cases where prompt response should supercede notification. The person, operator or facility shall submit a full report of the incident to the division on Form C-141 no later than fifteen (15) days following the release.

M. Additional Standards. The division may require more stringent standards on a case-by-case basis than those set forth in this Section, or require corrective actions if necessary, to maintain control of a well or any other facility or to safeguard public safety.