STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF THE NEW MEXICO OIL CONSERVATION DIVISION, THROUGH THE ENVIRONMENTAL BUREAU CHIEF, FOR THE ADOPTION OF AMENDMENTS TO DIVISION RULE 118 (HYDROGEN SULFIDE GAS)

CASE NO. 12897

ORDER NO. R-11847

ORDER OF THE OIL CONSERVATION COMMISSION

BY THE COMMISSION:

THIS MATTER came before the Oil Conservation Commission (hereinafter referred to as "the Commission") on July 19, August 30, September 20, September 27, and November 22, 2002 at Santa Fe, New Mexico, on application of the New Mexico Oil Conservation Division through the Chief of the Environmental Bureau (hereinafter referred to as "the Division"), and the Commission, having carefully considered the evidence, the pleadings, comments and other materials submitted in support and in opposition of the proposal, now, on this 22nd day of November, 2002,

FINDS,

1. In this rule making proceeding, the Oil Conservation Division (hereinafter referred to as "the Division") has applied for repeal of existing Rule 118 of the Rules and Regulations of the Oil Conservation Division, 19.15.1.118 NMAC, and for adoption of a replacement rule, to be codified in the New Mexico Administrative Code as 19.15.2.52 NMAC.

2. To assist with the rulemaking, the Environmental Bureau of the Division (hereinafter referred to as "the Bureau") created a workgroup composed of industry technical personnel, the New Mexico Oil and Gas Association, the Independent Petroleum Association of New Mexico, other governmental agencies (including the Bureau of Land Management, and local emergency planning committees of several counties), the New Mexico Department of Public Safety and members of the Environmental Bureau. The workgroup was charged with reviewing a draft rule prepared

by the Bureau and making recommendations. That group has prepared and submitted a consensus draft of a proposed rule to the Commission. The work of this group has been of invaluable assistance to the Commission.

3. Two public hearings have been conducted, one on July 19, 2002 and a second on September 20, 2002. The Commission accepted written comments concerning the proposed rulemaking following the first hearing, and prior to the second hearing. The Commission also accepted a report and consensus draft from the hydrogen sulfide workgroup on October 15, 2002. The Commission deliberated on the application in open session during its meetings of August 30, September 27, October 25, and November 22, 2002.

4. A draft of a new rule, 19.15.2.52 NMAC, is attached hereto as Exhibit A. It should be adopted, published in the New Mexico Register, and adopted as a part of the Rules and Regulations of the Oil Conservation Division.

5. The need for effective regulation of hydrogen sulfide gas is undisputed. Hydrogen sulfide is an extremely toxic gas sometimes encountered in the drilling and production of crude oil and natural gas. The gas is so toxic that exposure to a concentration of between 350 to 500 parts per million for four to eight hours can cause death. Exposure to a concentration of between 600 and 1500 parts per million for two minutes or less can cause death. Its toxicity explains why exposure to hydrogen sulfide gas is the leading cause of sudden death in the workplace, according to the Centers for Disease Control/National Institute for Occupational Safety and Health (hereinafter referred to as "NIOSH").

6. While hydrogen sulfide is one of the most odiferous substances that exists (it emits an odor like rotten eggs), exposure to concentrations of the gas around one hundred parts per million deadens the sense of smell so that it cannot be detected. Therefore, at its most deadly concentrations, it cannot be detected by smell alone.

7. Effects of exposure to hydrogen sulfide vary depending on the concentration and the duration of the exposure, the person's body weight, the previous history of exposure to hydrogen sulfide, and the person's overall health. For example, exposure to fifty parts per million for a few minutes will induce a severe headache and produce difficulty breathing and thinking. Once a level of fifty parts per million is reached, regulations of the Occupational Health and Safety Administration (hereinafter referred to as "OSHA") require a worker to don protective equipment including a respirator. Exposure to one hundred parts per million for a few minutes will induce respiratory difficulties; regulations of OSHA require immediate workplace evacuation if concentrations reach this level. OSHA has declared that exposure to one hundred parts per million of hydrogen sulfide for thirty minutes is "immediately dangerous to life and

health" (IDLH). Exposure to a level of five hundred parts per million for a few minutes may induce unconsciousness or death.

8. Hydrogen sulfide gas is already regulated in New Mexico through Rule 118, 19.15.1.118 NMAC.

9. The application of the Division seeking repeal Rule 118 and a replacement rule culminated an approximately two-year process during which the provisions of Rule 118 were critically examined.

10. During the winter of 2000-01, the Director of the Division directed the Bureau to review the Rule 118 and determine whether it was adequately protective of public safety. The Bureau subsequently gathered information from other governmental agencies, the American Petroleum Institute (API) and the American Society for Testing and Materials (ASTM). After comparing the information received to Rule 118 and conducting its own technical inquiries, the Bureau concluded that Rule 118 was not adequately protective of public safety and had serious flaws.

11. For example, during the hearings in this matter, witnesses employed by the Bureau testified that Rule 118 exempts facilities that process a volume fraction of hydrogen sulfide gas less than 10 mcf per day regardless of the actual concentration of gas that might result if a release were to occur. A facility that handles just less than 1,000 mcf per day of a gaseous mixture that consists of one percent hydrogen sulfide gas would be exempt, notwithstanding the fact that a release could produce a radius of exposure of five hundred parts per million of hydrogen sulfide gas two hundred feet from the point of release and one hundred parts per million four hundred-fifty feet from the point of release.

12. Witnesses also testified that Rule 118 exempts tanks that may contain a concentration of hydrogen sulfide gas up to 1,000 parts per million and certain other facilities that may contain a concentration of hydrogen sulfide gas up to 500 parts per million. Witnesses testified that such facilities are not required to operate according to any standards, are not required to have certain safety devices or procedures, signs, fencing or contingency plans.

13. It is thus evident that Rule 118 fails to adequately protect the public from the hazards of hydrogen sulfide and should be repealed and replaced with a more effective regulatory scheme.

14. Having found that the current regulatory scheme was inadequate, the Bureau set out to develop a replacement rule. The Bureau examined air-dispersion models to determine how hydrogen sulfide gas disperses in air following an accidental release. Such mathematical models are used to predict the probability of exposure to a given

concentration of hydrogen sulfide gas at selected distances from a hypothetical point of release. As hydrogen sulfide moves away from the point of release, its concentration decreases as it disperses; mathematical models seek to define the concentrations at a certain distance from the theoretical point of release. Several models are available. The Bureau chose the Pasquill-Gifford equation, an equation derived from the Gaussian distribution plume model. This particular model assumes a continuous source. Thus, while the model tends in some cases to overstate the consequences of a release, it serves to better protect public safety. Most states and the federal government use a steady state model like Pasquill-Gifford. The equation, through a coefficient, takes into account environmental factors and weather, and the modeling conducted by the Bureau used climatological data specific to New Mexico.

15. The Pasquill-Gifford model, providing both an adequate margin of safety for protection of the public, and having been accepted by other regulatory bodies, should be adopted in New Mexico and use of this model (or some other equivalent model approved by the Division) is required in Exhibit A.

16. As noted previously, one hundred parts per million is widely accepted as a point where exposure to hydrogen sulfide becomes dangerous to life. OSHA regards exposure to one hundred parts per million of hydrogen sulfide for thirty minutes as "immediately dangerous to life and health." If, applying the Pasquill-Gifford equation, a concentration of one hundred parts per million exists in any public area, a concentration of five hundred parts per million exists at any public road, or a concentration of one hundred parts per million exists more than three thousand feet from the release point, a potentially hazardous volume of hydrogen sulfide gas exists. Once a potentially hazardous volume is determined to be present, Exhibit A imposes regulatory requirements for operations of such facilities.

17. If a potentially hazardous volume is created, then Exhibit A also requires that the "radius of exposure" and the "area of exposure" be computed. The radius of exposure uses the mathematical model to describe a distance from a hypothetical release where certain regulatory requirements designed to be protective of public safety should attach. The radius of exposure in turn describes a circular area around the theoretical point of release; this describes the theoretical area of exposure.

18. If a concentration of less than one hundred parts per million is known to exist, a release would not be immediately dangerous to life. Once a gaseous mixture is determined to be below this threshold, Exhibit A requires no further actions with respect to the well, facility or operation.

19. To determine using the Pasquill-Gifford equation whether a potentially hazardous volume is present, the concentration of hydrogen sulfide within the gaseous mixture and the potential volume of a theoretical release need to be known. This can

only be known by testing or by applying process knowledge, and Exhibit A requires that this determination be made on all wells, facilities or operations.

20. If a concentration of one hundred parts per million or greater exists, a further determination of whether a potentially hazardous volume is present should be made, and regulatory requirements should attach to operations depending on the proximity of the operations to areas where the public will be present.

21. Some provision has to be made for wells that are drilled in areas where insufficient data exists to assess the hydrogen sulfide risk. The proposal of the Division assumes a 3,000 foot radius of exposure in these situations, and this does not seem an unreasonable assumption and provides an adequate margin of error.

22. While there was general agreement among persons participating in the rule-making process concerning the foregoing, some specific regulatory requirements contained in Exhibit A were a source of controversy. Some of these are discussed in the following paragraphs.

23. For example, the applicability of the regulation to Rule 711 became an issue. Exhibit A clarifies that surface waste management facilities are to be governed by both the new Rule 52 (19.15.3.52 NMAC) and Rule 711 (19.15.5.711 NMAC). Rule 711, and permits issued thereunder, may under some circumstances provide more stringent requirements for managing hydrogen sulfide gas than set out in Exhibit A. A representative for one such facility seemed to argue that this regulation, if enacted, would void provisions of Rule 711 and more stringent provisions of permits issued thereunder.

24. It seems, however, to be undisputed that surface waste facilities regulated under Rule 711 have the potential to generate hydrogen sulfide. Exhibit A is intended to protect public safety from the acute consequences of exposure to hydrogen sulfide. Such consequences can certainly result from surface waste management. Nothing therefore justifies excusing such facilities from the requirements of the proposed rule, nor can changes to Rule 711 be justified without going through the rule-making process to revisit that rule. Staff should be directed to examine the requirements of Rule 711 and determine whether changes to the hydrogen sulfide regime in that rule need to be considered in light of this rulemaking.

25. The attached regulation should apply equally to surface waste management facilities as it does to all the other facilities, and nothing in this regulation can be interpreted to provide for a repeal of any provision of Rule 711 or to effect any change in any permit issued thereunder. The language of Exhibit A has been amended to clearly state this proposition.

26. As noted, a consensus draft of the proposed regulation was presented by the hydrogen sulfide workgroup. That draft represented a consensus of members of the hydrogen sulfide gas workgroup and the Bureau concerning specific items of concern in earlier drafts. Many of the recommendations embodied in that draft should be accepted, and are reflected in Exhibit A.

27. However, several recommendations are not acceptable or reasonable and should not be adopted.

28. For example, the consensus draft provides that the test results and the resulting radius of exposure should be submitted within one year and a hydrogen sulfide contingency plan should be submitted one year later. These time frames are simply too long to be reasonable. While it is true that the new rule adopts a different regulatory approach than the existing rule and wells, facilities and operations should be provided with reasonable time to comply with the new requirements, two years is too long. Exhibit A provides six months to perform the initial testing and determination, and an additional six months to prepare a hydrogen sulfide contingency plan.

29. The consensus draft proposed that activation of the hydrogen sulfide contingency plan occur upon release of a potentially hazardous volume of hydrogen sulfide or when a concentration of fifty parts per million is created at the "boundary" of a facility. The problem with this approach is that a potentially hazardous volume is a calculated volume, and represents a worst-case scenario. A release, if one occurs, may be less than a worst-case scenario. The problem with activating a plan based on a concentration of fifty parts per million at the boundary is the difficulty in locating the boundary. This could cause uncertainty at a critical time and could result in a delay of implementation of contingency plans and a delay in public notice and evacuation, and the benefits of having a plan to protect public safety could be lost. Obviously, a plan must be activated if a potentially hazardous volume is released and Exhibit A requires activation under these circumstances. To avoid the difficulty of quantifying some lesser standard, Exhibit A also requires activation of the plan if a "potentially significant release" occurs; this places the burden on the operator to use judgment and activate the plan when a significant release occurs or the situation is beginning to move out of control. Exhibit A also requires an operator to set a site-specific threshold level as part of the hydrogen sulfide contingency plan.

30. The consensus draft proposed that the new regulation "grandfather" requirements for new signs used to warn the public of the hazards of hydrogen sulfide at wells, facilities and operations. It is an unacceptable compromise of public safety to permit signage (which may exist at a well for the life of well) to become exempt from the provisions of the new rule indefinitely. However, it is also sensible to permit a reasonable length of time to replace signage, and Exhibit A requires that nonconforming

signage be replaced or newly required signs be installed no later than one year after the effective date of the rule.

31. The consensus draft also provides a broad exemption from regulation under the proposed rule if the well, facility or operation is the subject of a regulatory program of another jurisdictional entity, such as the Bureau of Land Management, federal Department of Transportation or OSHA. The proposed rule, however, differs in important respects from the rules and regulations of the Bureau of Land Management or OSHA, and including such a provision in the proposed rule would effectively write out many of its important provisions for wells on federal land. Such a provision should not appear in Exhibit A. However, Exhibit A does permit any operator to apply for an exemption from any provision of the rule should circumstances warrant. Compliance with the provisions of another regulatory program may be grounds for granting an exemption. Exhibit A also permits submission of a hydrogen sulfide contingency plan that is prepared in conjunction with another regulatory program and, so long as it addresses the subjects described in Exhibit A, such a plan will be acceptable.

32. The consensus draft also responded to many comments concerning the electronic submission requirements of earlier drafts. The Division performs many of its functions electronically. As time goes on, more and more functions will be performed electronically. Earlier drafts reflected that reality. However, because of concerns expressed that some smaller operators may have limited ability to respond electronically, Exhibit A has been amended to *permit* electronic submission, not require it for operations with fewer than one hundred wells. Hopefully, the bulk of submissions will be made electronically.

33. The consensus draft also eliminated a provision that permitted the Division to require corrective actions if necessary to maintain control of a well or other facility and to safeguard public safety; the consensus draft substituted language that is awkward and contains multiple standards. While the Division certainly has authority under the Oil and Gas Act to require corrective actions if necessary to maintain control of a well or other facility or to safeguard the public safety, that fact need not be repeated in Exhibit A. The deletion of the reference from Exhibit A should not be read as an abdication of that authority.

34. There has been some disagreement during the rulemaking process concerning the proposed requirement that an operator develop a hydrogen sulfide contingency plan, and what it should contain. Preparation of a contingency plan serves several objectives. First, it ensures that the operator focuses on emergency preparedness and thinks about what actions must be taken in the event of a release. If a release occurs, the exercise of writing a plan and thinking through the steps that must be taken may improve response and may save lives. Second, preparation of a plan provides the Division, the incident commander, the Department of Public Safety, and other emergency responders with basic

information needed to make intelligent decisions concerning the release. For example, having access to the telephone numbers of company personnel means that personnel can be contacted to address an incident before it becomes a threat to public safety. Having the names and telephone numbers available of persons potentially at risk simplifies warning and evacuation, should that become necessary.

35. The consensus draft argues for more flexibility in drafting a plan that is sensible when applied to a particular facility, and that is a sensible approach. Therefore, Exhibit A requires such plans to address certain subjects, but leaves the specificity in developing a plan to the operator. If it is apparent that a plan is defective, the Division has the authority under Exhibit A to require amendments to address the deficiency.

36. The consensus draft permits substitution of a hydrogen sulfide contingency plan prepared for another agency, such as the Bureau of Land Management. The concept has not been perpetuated in Exhibit A. As noted in paragraph 31, herein, a plan prepared for another agency may in fact comply fully with the requirements under the proposed rule; in other cases it may not. The Division should be permitted to review the plan and determine whether it is acceptable before substitution is permitted. This is the approach taken in Exhibit A.

37. There has been some controversy during the rulemaking process about the use of employee protection standards (OSHA and NIOSH), the argument being that double regulation could result. It should be very clear that Exhibit A is not a worker protection rule. It is a public safety rule. However, as several witnesses testified during the two public hearings in this matter, protection of workers is relevant to public safety. If workers are not protected from hydrogen sulfide gas, the public safety may suffer because it is the workers who are the first line of defense in the event of a release. Only the workers can prevent or contain a release of hydrogen sulfide gas. If the workers are alerted to a release, they can contain it or give a timely warning to permit evacuation.

38. The training requirements set forth in Exhibit A share the same rationale. Workers need to be trained to properly respond to hydrogen sulfide to protect themselves and the public from exposure. Well-trained workers can prevent releases in the first place. If a situation gets out of control, well-trained workers can provide necessary (and early) warning and evacuation. Well-trained workers will be able to provide a warning of the hazardous situation to those who happen on the situation.

39. There has also been a limited amount of controversy during these proceedings concerning requirements to amend a hydrogen sulfide contingency plan to address encroachment within a public area or the creation of a public road where one previously did not exist. The consensus draft proposed to eliminate this provision. However, some language is necessary to ensure that persons at risk are alerted to a release and that the plan accurately describes needed emergency response activities. Exhibit A solves the

problem by providing that when an encroachment occurs that results in a potentially hazardous volume where none existed previously, a hydrogen sulfide plan must be prepared and submitted. The typical scenario involves a fairly remote well site where no contingency plan is required because no public road or public area is present. A road and a dwelling are then subsequently constructed that, because of the proximity to the site, creates a potentially hazardous volume. Without a requirement that a plan be submitted under these circumstances, a plan to notify the persons in the dwelling would not be in place and, in the event of a release, precious time might be lost making contact.

40. It appears from the record of these proceedings, the testimony and comments received, and from a review of the various forms of the proposed language, that Exhibit A provides the best available balance of sensible regulation with protection of the public safety and represents a significant improvement over Rule 118.

41. Exhibit A should be adopted as a rule of the Oil Conservation Division and present Rule 118 should be repealed effective as of the effective date of Exhibit A.

IT IS THEREFORE ORDERED:

1. A new regulation of the Oil Conservation Commission, to be codified at 19.15.2.52 NMAC (or elsewhere if necessary to meet requirements of the Commission of Public Records), copy attached as Exhibit A, is hereby adopted, effective as of the date of its publication in the New Mexico Register. Staff is instructed to forthwith seek publication of the new regulation in its entirety in the Register.

2. Rule 118 of the Oil Conservation Commission, presently codified at 19.15.1.118 NMAC shall be and hereby is repealed, effective as of the date of publication of a notice of repeal in the New Mexico Register. Staff is instructed to forthwith seek publication of a notice of repeal in the Register.

3. Staff of the Oil Conservation Division is instructed to examine the requirements of Rule 711 and determine whether changes to the hydrogen sulfide regime need to be reconsidered in light of this rulemaking.

4. Jurisdiction of this matter is retained for entry of such further orders as may be necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

LORI WROTENBERY, CHAIR

JAMI BAILEY, MEMBER

ROBERT LEE, MEMBER

S E A L

EXHIBIT A

19.15.2.52 HYDROGEN SULFIDE GAS (HYDROGEN SULFIDE)

A. Applicability. 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, injecting into, 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 (referred to herein as "person, operator or facility" or "well, facility or operation"). This section shall not act to exempt or otherwise excuse surface waste management facilities permitted by the division pursuant to 19.15.9.711 NMAC from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19.15.9.711 NMAC or more stringent conditions in permits issued thereunder, nor shall such facilities be exempt or otherwise excused from the requirements set forth in this section by virtue of permitting under 19.15.9.711 NMAC.

B. Definitions (specific to this section).

(1) ANSI. The acronym "ANSI" means the american national standards institute.

(2) API. The acronym "API" means the american petroleum institute.

(3) Area of Exposure. The phrase "area of exposure" means the area within a circle constructed with a point of escape at its center and the radius of exposure as its radius.

(4) ASTM. The acronym "ASTM" means the american society for testing and materials.

(5) Dispersion Technique. A "dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of hydrogen sulfide gas in the atmosphere.

(6) 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 hydrogen sulfide, as set forth herein.

(a) For existing gas facilities or operations, the escape rate shall be calculated using the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For an existing gas well, the escape rate shall be calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.

(b) For new gas operations or facilities, the escape rate shall be calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate shall be calculated using the maximum open-flow rate of offset wells in the pool or reservoir, or the pool or reservoir average of maximum open-flow rates.

(c) For existing oil wells, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate thereof.

(d) For new oil wells, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate of offset wells in the pool or reservoir, or the pool or reservoir average of the producing gas/oil ratio multiplied by the maximum daily production rate.

(e) For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of the gaseous mixture through the system or the best estimate thereof.

(7) GPA. The acronym "GPA" means the gas processors association.

(8) 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.

(9) NACE. The acronym "NACE" refers to the national association of corrosion engineers.

(10) PPM. The acronym "ppm" means "parts per million" by volume.

(11) Potentially Hazardous Volume means the volume of hydrogen sulfide gas of such concentration that:

(a) the 100-ppm radius of exposure includes any public area;

(b) the 500-ppm radius of exposure includes any public road; or

(c) the 100-ppm radius of exposure exceeds 3,000 feet.

(12) Public Area. A "public area" is any building or structure that is not associated with the well, facility or operation for which the radius of exposure is being calculated and that is used as a dwelling, office, place of business, church, school, hospital, or government building, or any portion of a park, city, town, village or designated school bus stop or other similar area where members of the public may reasonably be expected to be present.

(13) Public Road. A "public road" is any federal, state, municipal or county road or highway.

(14) Radius of Exposure. The radius of exposure is that radius constructed with the point of escape as its starting point and its length 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: $X = [(1.589)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

(b) For determining the 500-ppm radius of exposure: $X=[(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

(c) For a well being drilled, completed, recompleted, worked over or serviced in an area where insufficient data exists 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.

C. Regulatory Threshold.

(1) Determination of Hydrogen Sulfide Concentration.

(a) Each person, operator or facility shall determine the hydrogen sulfide concentration in the gaseous mixture within each of its wells, facilities or operations either by testing (using a sample from each well, facility or operation), testing a representative sample, or using process knowledge in lieu of testing. If a representative sample or process knowledge is used, the concentration derived from the representative sample or process knowledge must be reasonably representative of the hydrogen sulfide concentration within the well, facility or operation.

(b) The tests used to make the determination referred to in the previous subparagraph shall be conducted in accordance with applicable ASTM or GPA standards or by another method approved by the division.

(c) If a test was conducted prior to the effective date of this section that otherwise meets the requirements of the previous subparagraphs, new testing shall not be required.

(d) If any change or alteration may materially increase the concentration of hydrogen sulfide in a well, facility or operation, a new determination shall be required in accordance with this section.

(2) Concentrations Determined to be Below 100 ppm. If the concentration of hydrogen sulfide in a given well, facility or operation is less than 100 ppm, no further actions shall be required pursuant to this section.

(3) Concentrations Determined to be Above 100 ppm.

(a) If the concentration of hydrogen sulfide in a given well, facility or operation is determined to be 100 ppm or greater, then the person, operator or facility must calculate the radius of exposure and comply with applicable requirements of this section.

(b) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the results of the determination of the hydrogen sulfide concentration and the calculation of the radius of exposure shall be provided to the division. For a well, facility or operation existing on the effective date of this section, the determination, calculation and submission required herein shall be accomplished within 180 days of the effective date of this section; for any well, facility or operation that commences operations after the effective date of this section, the determination, calculation and submission required herein shall be accomplished before operations begin.

(4) Recalculation. The person, operator or facility shall calculate the radius of exposure if the hydrogen sulfide concentration in a well, facility or operation increases to 100 ppm or greater. The person, operator or facility shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of twenty-five percent in a well, facility or operation that previously had a hydrogen sulfide concentration of 100 ppm or greater. If calculation or recalculation of the radius of exposure reveals that a potentially hazardous volume is present, the results shall be provided to the division within sixty (60) days.

D. Hydrogen Sulfide Contingency Plan.

(1) When Required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, a hydrogen sulfide contingency plan that will be used to alert and protect the public must be developed in accordance with the following paragraphs.

(2) Plan Contents.

(a) API Guidelines. The hydrogen sulfide contingency plan shall be developed with due consideration of paragraph 7.6 of 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, most recent edition, or with due consideration to another standard approved by the division.

(b) Required Contents. The hydrogen sulfide contingency plan shall contain, but shall not be limited to, information on the following subjects, as appropriate to the well, facility or operation to which it applies:

(i) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures to be followed in the event of a release and shall include, at a minimum, information concerning the responsibilities and duties of

personnel during the emergency, an immediate action plan as described in the API document referenced in the previous subsubparagraph, and telephone numbers of emergency responders, public agencies, local government and other appropriate public authorities. The plan shall also include the locations of potentially affected public areas and public roads and shall describe proposed evacuation routes, locations of any road blocks and procedures for notifying the public, either through direct telephone notification using telephone number lists or by means of mass notification and reaction plans. The plan shall include information on the availability and location of necessary safety equipment and supplies.

(ii) Characteristics of hydrogen sulfide and sulfur dioxide. The hydrogen sulfide contingency plan shall include a discussion of the characteristics of hydrogen sulfide and sulfur dioxide.

(iii) Maps and drawings. The hydrogen sulfide contingency plan shall include maps and drawings that depict the area of exposure and public areas and public roads within the area of exposure.

(iv) Training and Drills. The hydrogen sulfide contingency plan shall provide for training and drills, including training in the responsibilities and duties of essential personnel and periodic on-site or classroom drills or exercises that simulate a release, and shall describe how the training, drills and attendance will be documented. The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate on the proper protective measures to be taken in the event of a release, and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans.

(v) Coordination with State Emergency Plans. The hydrogen sulfide contingency plan shall describe how emergency response actions under the plan will be coordinated with the division and with the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan (HMER).

(vi) Activation Levels. The hydrogen sulfide contingency plan shall include the activation level and a description of events that could lead to a release of hydrogen sulfide sufficient to create a concentration in excess of the activation level.

(3) Plan Activation. The hydrogen sulfide contingency plan shall be activated when a release creates a concentration of hydrogen sulfide greater than the activation level set forth in the hydrogen sulfide contingency plan. At a minimum, the plan must be activated whenever a release may create a concentration of hydrogen sulfide of more than 100 ppm in any public area, 500 ppm at any public road or 100 ppm 3,000 feet from the site of release.

(4) Submission.

(a) Where Submitted. The hydrogen sulfide contingency plan shall be submitted to the division.

(b) When Submitted. A hydrogen sulfide contingency plan for a well, facility or operation existing on the effective date of this section shall be submitted within one year of the effective date of this section. A hydrogen sulfide contingency plan for a new well, facility or operation shall be submitted before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation must be on file with the division before operations commence and may be submitted separately or along with the application for permit to drill (APD) or may be on file from a previous submission. A hydrogen sulfide contingency plan shall also be submitted within 180 days after the person, operator or facility becomes aware or should have become aware that a public area or public road is established that creates a potentially hazardous volume where none previously existed.

(c) Electronic Submission. Any filer who operates more than one hundred wells or who operates a crude oil pump station, compressor station, refinery or gas plant must submit each hydrogen sulfide contingency plan in electronic format. The hydrogen sulfide contingency plan may be submitted through electronic mail, through an Internet filing or by delivering electronic media to the division, so long as the electronic submission is compatible with the division's systems.

(5) Failure to Submit Plan. Failure to submit a hydrogen sulfide contingency plan when required may result in denial of an application for permit to drill, cancellation of an allowable for the subject well or other enforcement action appropriate to the well, facility or operation.

(6) Review, Amendment. The person, operator or facility shall review the hydrogen sulfide contingency plan any time a subject addressed in the plan materially changes and make appropriate amendments. If the division determines that a hydrogen sulfide contingency plan is inadequate to protect public safety, the division may require the person, operator or facility to add provisions to the plan or amend the plan as necessary to protect public safety.

(7) Retention and Inspection. The hydrogen sulfide contingency plan shall be reasonably accessible in the event of a release, maintained on file at all times, and available for inspection by the division.

(8) Annual Inventory of Contingency Plans. On an annual basis, each person, operator or facility required to prepare one or more hydrogen sulfide contingency plans pursuant to this section shall file with the appropriate local emergency planning committee and the state emergency response commission an inventory of the wells, facilities and operations for which plans are on file with the division and the name, address and telephone number of a point of contact.

(9) Plans Required by Other Jurisdictions. A hydrogen sulfide contingency plan required by the Bureau of Land Management or other jurisdiction that meets the requirements of this subsection may be submitted to the division in satisfaction of this subsection.

E. Signage, Markers. For each well, facility or operation involving a concentration of hydrogen sulfide of 100 ppm or greater, signs and/or markers shall be installed and maintained. Each sign or marker shall conform with the current ANSI standard Z53.1 or some other standard approved by the division, shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. Signs or markers shall be prominently posted at locations, including but not limited to entrance points and road crossings, sufficient to alert the public that a potential danger exists. Signs and/or markers that conform with this subsection shall be installed no later than one year from the effective date of this section.

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

(1) API Standards. All drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater 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 Drilling and Well Servicing Operations Involving Wells Containing Hydrogen Sulfide," RP-49, most recent editions, or some other standard approved by the division.

(2) Detection and Monitoring Equipment. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include hydrogen sulfide detection and monitoring equipment as follows:

(a) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that will automatically activate visible and audible alarms when the ambient air concentration of hydrogen sulfide reaches a predetermined value set by the operator, not to exceed 20 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.

(b) 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.

(c) Hydrogen sulfide detection and monitoring equipment must be provided and must be made operational during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

(3) Wind Indicators. All drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. 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. When a sustained concentration of hydrogen sulfide is detected in excess of 20 ppm at any detection point, red flags shall be displayed.

(4) Flare System. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous volume of hydrogen sulfide will be encountered, the person, operator or facility shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. Flare outlets shall be located at least 150 feet from the well bore. 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 provide supplemental fuel to maintain ignition.

(5) Well Control Equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment shall be required:

(a) Drilling. A remote-controlled well control system shall be installed and operational at all times beginning when drilling is within 500 feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system must include, at a minimum, a pressure and hydrogen-sulfide-rated well control choke and kill system including manifold and blowout preventer that meets or exceeds the specifications API-16C and API-RP 53 or other specifications approved by the division. Mud-gas separators shall be used. These systems shall be tested and maintained pursuant to the specifications referenced, according to the requirements of this part, or otherwise as approved by the division.

(b) Completion, Workover and Well Servicing. A remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other specifications approved by the division shall be installed and shall be operational at all times during completion, workover and servicing of a well.

(6) Mud Program. All drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall use a hydrogen sulfide mud program capable of handling hydrogen sulfide conditions and well control, including de-gassing.

(7) Well Testing. Except with prior approval of the division, drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater shall be conducted only during daylight hours and formation fluids shall not be permitted to flow to the surface.

(8) If Hydrogen Sulfide Encountered During Operations. If hydrogen sulfide was not anticipated at the time the division issued a permit to drill but is encountered during drilling in a concentration of 100 ppm or greater, the operator must satisfy the requirements of this section before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that have been or are being taken as soon as possible, but no later than 24 hours following discovery. The division may grant verbal approval to continue drilling operations pending preparation of any required hydrogen sulfide contingency plan.

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

(1) API Standards. Operations at crude oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations involving a concentration of hydrogen sulfide of 100 ppm or greater 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 or some other standard approved by the division.

(2) Security. Well sites and other unattended, fixed surface facilities involving a concentration of hydrogen sulfide of 100 ppm or greater shall be protected from public access by fencing with locking gates when the location is within 1/4 mile of a public area. A surface pipeline shall not be considered a fixed surface facility for purposes of this paragraph.

(3) Wind Direction Indicators. All crude oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a concentration of hydrogen sulfide of 100 ppm or greater shall have equipment to indicate wind direction. The wind direction equipment shall be installed and visible from all principal working areas at all times.

(4) Well Control Equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required:

(a) Safety devices, such as automatic shut-down devices, shall be installed and maintained in good operating condition to prevent the escape of hydrogen sulfide. Alternatively, safety procedures shall be established to achieve the same purpose.

(b) Any well shall possess a secondary means of immediate well control through the use of an appropriate christmas tree or downhole completion equipment. Such equipment shall allow downhole accessibility (reentry) under pressure for permanent well control.

(5) Tanks or vessels. Each stair or ladder leading to the top of any tank or vessel containing 300 ppm or more of hydrogen sulfide in the gaseous mixture shall be chained or marked to restrict entry.

(6) Compliance Schedule. Each existing crude oil pump station, producing well, tank battery and associated production facility, pipeline, refinery, gas plant and compressor station not currently meeting the requirements of this subsection shall be brought into compliance within one year of the effective date of this section.

H. Personnel Protection and Training. All persons responsible for the implementation of any hydrogen sulfide 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. Whenever a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, equipment shall be selected with consideration for both the hydrogen sulfide working environment and anticipated stresses and NACE Standard MR0175 (latest edition) or some other standard approved by the division shall be used for selection of metallic equipment or, if applicable, adequate protection by chemical inhibition or other methods that control or limit the corrosive effects of hydrogen sulfide shall be used.

J. Exemptions. Any person, operator or facility may petition the director or the director's designee for an exemption to any requirement of this section. 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 or the director's designee, after considering all relevant factors, may approve an exemption if the circumstances warrant and so long as the public safety will be protected.

K. Notification of the Division. The person, operator or facility shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan as soon as possible, but no more than four hours after plan activation, recognizing that a 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.