



**Chairman David Porter**  
**Commissioner Christi Craddick**  
**Commissioner Ryan Sitton**

# Statewide Rule 36: Operations in Hydrogen Sulfide Areas

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Travis Baer, P.E.

Engineering Specialist

Phone: 210-227-1313 (x23)

Email: [travis.baer@rrc.texas.gov](mailto:travis.baer@rrc.texas.gov)



# RRC Mission

Our mission is to serve Texas by our stewardship of natural resources and the environment, our concern for personal and community safety, and our support of enhanced development and economic vitality for the benefit of Texans.



# Session Description

## Objective

Discussion of the Statewide Rule 36 including general requirements, H-9 Certificate of Compliance, radius of exposure, safety issues, and contingency plans.



# Hydrogen Sulfide Characteristics

## What is H<sub>2</sub>S?

- Colorless gas with a flame that is practically invisible
- Heavier than air
- Soluble in oil and water
- Dangerous to health
- Sewer gas, stink damp, sour crude, rotten-egg gas



# H2S Facts

## Where do you find H2S?

- Variety of natural and industrial settings
- Natural gas and petroleum
- Most H2S obtained as by-product
- Can be recovered from natural gas and refining operations and converted to sulfuric acid or high quality Sulfur



# Statewide Rule 36

**Texas Administrative Code (TAC)**

**Title 16, Part 1, Chapter 3**

**§3.36**

**Oil, Gas, or Geothermal Resource Operation in  
Hydrogen Sulfide Areas**



# Statewide Rule 36

## Introduction

- Designed to protect public from hazards of hydrogen sulfide gas (H<sub>2</sub>S)
- Education and training are the best defenses
- Industry must protect themselves, public
- Denver City H<sub>2</sub>S tragedy, February 1975



# Testing for H<sub>2</sub>S

- Multiple sample points
  - Wellhead, test separator (for ROE)
  - Storage Tanks
- Test Methods
  - Gas chromatography, Tutwiler
  - Colorimetric tubes\*

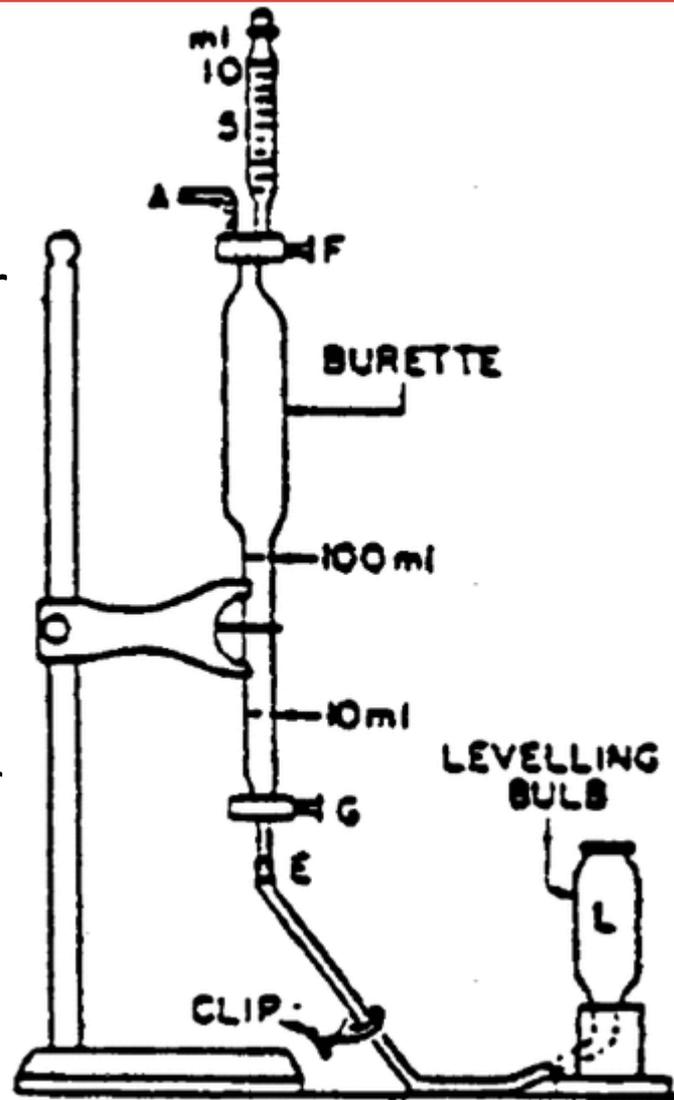


Image Source: "Figure 1" Federal Register § 60.5408



# Statewide Rule 36

## Form H-9 Certificate of Compliance required:

- H<sub>2</sub>S concentration is 100 ppm or greater in system/operation
- Producing/injection in designated H<sub>2</sub>S field
- Storage tank contains H<sub>2</sub>S concentration of 500 ppm or higher.
- Drilling into known H<sub>2</sub>S field near a public area
- Drilling into a wildcat field (H<sub>2</sub>S)

•NOTE: A field is designated as sour when an operator files a Production H-9 indicating 100 ppm or greater H<sub>2</sub>S concentration.



# Compliance requirements

- Exploration, production and transportation of hydrocarbon fluids that contain hydrogen sulfide gas at 100 ppm or greater concentration
- Exceptions:
  - gathering, storing and transporting stabilized liquid hydrocarbons (atmospheric pressure)
  - refining, petrochemical and chemical plants
  - operations where concentration of H<sub>2</sub>S is less than 100 ppm



# Radius of Exposure (ROE)

SWR 36 identifies two ROEs that identify potential danger, may require additional compliance.

- 100 ppm ROE – distance from release to where H<sub>2</sub>S concentration in air will dilute to 100 ppm.
  - Identifies public areas within the ROE
- 500 ppm ROE – distance from release to where H<sub>2</sub>S concentration in air will dilute to 500 ppm
  - Identifies public roads within the ROE
    - public roads are tax supported or any road used for public access/use



# Compliance Requirements Based on ROE

## RULE 36 COMPLIANCE REQUIREMENTS DRILLING & PRODUCTION

PROVISION	CASE 1	CASE 2	CASE 3
H <sub>2</sub> S Concentration Test	X	X	X
H-9	X	X	X
Training	X	X	X
District Office Notification	X	X	X
Drill Stem Tests Restricted	X*	X*	X
BOP Test	X*	X*	X
Materials		X	X
Warning and Marker		X	X
Security		X	X
Contingency Plan			X
Control and Equipment Safety			X
Monitors		X**	X**
Mud (ph Control or Scavenger)			X*
Wind Indicators		X**	X
Protective Breathing Equipment		X**	X
Choke Manifold, Secondary Remote Control, and Mud-Gas Separator			X
Flare Stacks			X*

Case 1: 100 ppm ROE  
is < 50'

Case 2: 100 ppm ROE ≥  
50' but < 3,000'  
& No Public Area

Case 3:

- 100 ppm ROE ≥ 50' & Public Area; or
- 500 ppm ROE contains Public Road; or
- 100 ppm ROE ≥ 3,000'



# Training

- Operations with 100 ppm or greater H<sub>2</sub>S shall train employees working in potentially affected areas in H<sub>2</sub>S safety
- Operators shall require service companies in H<sub>2</sub>S affected areas to utilize only personnel trained in H<sub>2</sub>S safety
- Training **MUST** be done on an annual basis



# Training

- Training **SHALL** include:
  - hazards and characteristics of H<sub>2</sub>S safety precautions
  - operations of safety and life support equipment
- Additional training for on-site supervisory personnel:
  - effects of H<sub>2</sub>S on metal components
  - corrective action and shutdown procedures
  - full knowledge of contingency plan



# Warning & Marker Provision

All new signs shall state “Caution” and “Poison Gas” with yellow and black contrast



# Warning & Marker Provision

- Signs must be of sufficient size
- Signs must be posted:
  - at well or facility within city limits or close proximity to public
  - at public road crossings
  - along a line when located within public area
  - along a road at frequent intervals to avoid accidental excavation



# Warning & Marker Provision

## Examples



# Security

- Facilities shall be fenced and locked
  - when located within  $\frac{1}{4}$  mile of a public area
  - for tank facilities within city/town limits
- The fencing provision will be considered satisfied where the fencing structure is a deterrent to public access.
- Specific fencing requirements required on case-by-case basis
  - District Office makes this determination



# Control & Safety Equipment

When the ROE and potential public exposure meet the conditions of a “Case 3” scenario:

- operators shall install and maintain devices and/or safety procedures to prevent the undetected, continuing release of H<sub>2</sub>S gas
- The rule does not specify type or quantity of monitoring devices or procedures. Each scenario is evaluated by RRC staff on a case-by-case basis.



# Materials & Equipment

- Manufactured to satisfy NACE MR-01-75 and API RP-14E requirements
- Materials not susceptible to H<sub>2</sub>S stress cracking may be used
  - fiberglass, plastics
  - when used for applicable industry standard, specifications or recommended practices
- Other materials may be used
  - Commission must approve case-by-case



# Contingency plan

- Plan of action for alerting, responding and protecting the public following release of potentially hazardous volume of H<sub>2</sub>S gas
- Instructions/procedures for alerting public/safety personnel of emergency
- Call list
  - supervisory personnel, sheriff, DPS, ambulance, fire department, doctors, RRC District Office, etc.



# Contingency plan

- Plat detailing area of exposure
- Names & telephone numbers of responsible parties
- Provisions for advance briefing of the public
- RRC District Office phone number
- Refer to SWR 36 “Contingency Plan Provisions” for a complete list of requirements.



# Accident notification

- Operator is responsible for notifying RRC District Office:
  - accidental release of H<sub>2</sub>S gas that may present a hazard
  - activation of contingency plan
  - incident/accident involving H<sub>2</sub>S gas
- A written report shall be furnished to the RRC District Office within 10 days of these conditions.



# Drilling and Workover

Requirements for drilling or workovers on leases with “Case 2” scenario:

- protective breathing equipment (SCBA) must be maintained at two or more locations
- wind indicators and H<sub>2</sub>S signs on site
- automatic H<sub>2</sub>S sensors/alarms



# Wildcat or “Case 3” drilling

- Choke manifold, mud de-gasser, flare, & ignition must be installed;
- Drill Stem Test of H<sub>2</sub>S zone
  - during daylight hours
  - RRC DO notified before test
- BOP and well control systems pressure tested
  - at or near compliance depth
  - RRC DO notified 4 hours prior



# Form H-9 Certificate of Compliance

- Certified operator has or will comply with the provisions
- H-9's are not transferable, each operator must test each lease/gas well or system and file H-9
  - file in triplicate with the District Office
  - file 30 days prior to commencement of drilling;
  - file within 30 days after P-4 certificate of transfer;
- New/amended H-9 filed if change in public exposure
- Signed by a person trained, experienced and qualified to make the certification



# Completion report required

- Shall report on the initial completion report for oil well and gas well gas the H<sub>2</sub>S concentration when completed either in a designated H<sub>2</sub>S field or the H<sub>2</sub>S is 100 ppm or greater
- Shall file a Drilling Form H-9 or provide a copy of a certified copy of a Production Form H-9 when submitting a drilling application that requires one to be filed



# Injection of H<sub>2</sub>S Gas

- Injection of fluids containing H<sub>2</sub>S is not allowed unless:
  - approved by Commission after public hearing
  - approved by District Office
- Contingency plan and control and safety equipment required
- Injection of sour produced water is not H<sub>2</sub>S injection



# Additional Information

## H2S Information on Our Website:

- **H2S Field Data:**

<http://www.rrc.texas.gov/oil-gas/research-and-statistics/field-data/h2s/>

- **Hydrogen Sulfide Safety Manual:**

<http://www.rrc.texas.gov/oil-gas/publications-and-notices/publications/swr36index/>

- **H-9 Certificate of Compliance Filings:**

<https://rrcsearch3.neubus.com/esd3-rrc/index.php? module =esd& action =keysearch&profile=53>



# RRC District Office H2S Coordinators

- San Antonio (01/02), Wesley Dresch\* (210) 227-1313
- Houston (03), Pete Fisher (713) 869-5001
- Corpus Christi (04), Rick Silguero (361) 242-3113
- Kilgore (05/06), Ronny Russell (903) 984-3026
- Abilene (7B), Sam Birdwell\*\* (325) 677-3545
- San Angelo (7C), Bill Spraggins (325) 657-7450
- Midland (08/8A), Tom Fouts (432) 684-5581
- Wichita Falls (09), Kim Peterson (940) 723-2153
- Pampa (10), Alan Leach (806) 665-1653

\*State Coordinator for Districts 1, 2, 3, 4, 5, & 6

\*\*State Coordinator for Districts 7B, 7C, 8/8A, 9 & 10



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Travis Baer, P.E.  
Engineering Specialist  
Phone: 210-227-1313 (x23)  
Email: [travis.baer@rrc.texas.gov](mailto:travis.baer@rrc.texas.gov)

