GW - 028

H_2S CONTINGENCY PLAN

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, August 14, 2012 8:27 AM
To: 'Lackey, Johnny'
Cc: Holder, Mike
Subject: RE: Navajo CP

Johnny:

Good morning. Yes, I received a package around 6/28.

I am in receipt of the electronic files. As you may know, I am swamped right now and trying to get to the H2S CP. Please continue to implement your H2S CP until further notice.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
Website: http://www.emnrd.state.nm.us/ocd/
"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

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From: Lackey, Johnny [mailto:Johnny.Lackey@hollyfrontier.com]
Sent: Monday, August 13, 2012 9:33 AM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike
Subject: Navajo CP

Carl.

I couldn't find where a copy of the Artesia H2S Contingency Plan was sent electronically to the Agency. I did send a hard copy via FedEx overnight on June 26, 2012. An updated schedule was emailed on July 24, 2012 (attached). Also attached are the .pdf files of the Artesia H2S Contingency Plan.

Thanks,

Johnny Lackey
The HollyFrontier Companies
P.O. Box 159
501 E. Main St.
Artesia, NM 88211-0159
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollyfrontier.com

HOLLYFRONTIER
THE HOLLYFRONTIER COMPANIES

June 26, 2012 **FedEx Overnight Delivery**

Carl Chavez, CHMN
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Navajo Refining Company, L.L.C., Artesia Refinery Hydrogen Sulfide Contingency Plan

Carl:

Enclosed is Navajo's Artesia, New Mexico Refinery H2S Contingency Plan for your review/comment/approval. I will be sending an electronic copy of the plan via email. The electronic copy will not have the full size Plot Plan found in Appendix D (enclosed with the FedEx Delivery).

Please contact me at 575-746-5490 if you have any questions.

Sincerely,

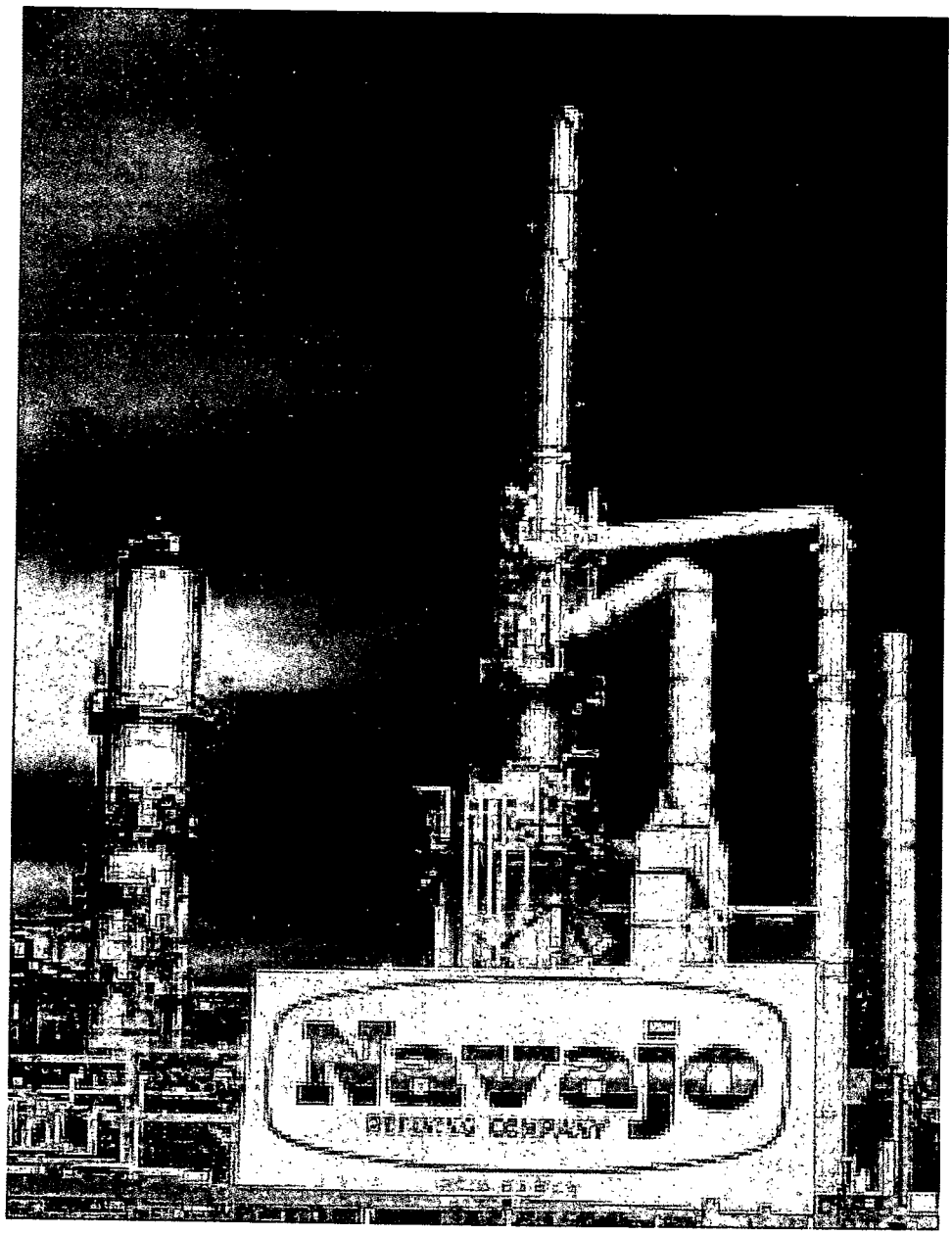
Johnny Lackey
Environmental Manager

Enclosure

RECEIVED OCD
2012 JUN 27 P 12:32

Navajo Refining Company, LLC
PO Box 159 • Artesia, NM 88211-0159 • (575) 748-3311
http://www.hollyfrontier.com

Navajo Refining Company
Artesia, NM



H2S Contingency Plan

Navajo Refining Company

Artesia Refinery

Artesia, New Mexico

June 2012

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ARTESIA REFINERY
NAVAJO REFINING

1.0 INTRODUCTION

The facility is a petroleum refinery which processes crude oil into asphalt, diesel fuel, naphtha, gasoline, kerosene, and liquefied petroleum gas (LPG). This facility:

- Processes crude at a combined rate of 100,000 barrels per day (bbls/day)
- Receives ~ 40,000 bbls/day of this volume from the Lovington Refinery
- Has an approximate total storage capacity of 1,300,000 barrels (bbls)
- Has an average storage volume of 500,000 to 750,000 bbls

Loading/unloading operations are conducted on a 24 hour, seven (7) day per week basis. The loading/unloading operations are listed in **Table 1**.

Table 1. Loading and Unloading Operations

Truck Loading	Truck Unloading	Rail Car Loading	Rail Car Unloading
Asphalt	Asphalt	Asphalt	LPG
Carbon Black Oil	Gas Oil	Carbon Black Oil	
Diesel Fuel/Gasoline	Crude Oil	Diesel Fuel	
LPG	Bulk Chemicals	Slurry	

1.1 Plant Description and Map

The Navajo Refinery is located in Artesia, Eddy County, New Mexico. It is owned and operated by Navajo Refining Company, a wholly owned subsidiary of HollyFrontier Corporation. **Table 2** provides details on Navajo Refinery's location.

Table 2. Navajo Refinery Location

Physical Address:	501 E. Main Street, Artesia, NM 88211-0159
Mailing Address:	P.O. Box 159, Artesia, NM 88211-0159
Latitude:	32.842 N
Longitude:	-104.391 W

The location of the Navajo Refinery is illustrated in **Figure 1**.

Figure 1. Location of Navajo Refinery (Approximate Boundaries)

1.2 Description of Operations

The Navajo Artesia refinery processes crude oil as well as intermediates received from outside sources such as Navajo's Lovington, NM refinery and other third-party sources. Crude oil and intermediates are purchased as needed or as justified on an economic basis. The crude oil and other intermediates enter the Artesia refinery via pipeline, truck, or rail. The Artesia refinery produces butane, propane, liquefied petroleum gas (LPG), jet fuels, kerosenes, diesel fuels, various grades of gasoline, carbon black oil (CBO), gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia refinery produces refinery fuel gas, hydrogen, nitrogen, and steam. The combined facility charge capacity is approximately 100,000 bbl/ day.

H_2S is produced by processing (primarily by hydrogen de-sulfurization) products distilled from crude oil, naphtha, kerosene, diesel, and gas oils at the Artesia Refinery. Small amounts of H_2S are present in crude oil and are recovered during distillation into fuel gas. Sour gas streams produced by processing and sour fuel gas from the crude unit are contacted with amine to recover H_2S from sour gas streams. The amine solution that absorbs the H_2S is circulated to a steam re-boiled Stripping Tower to regenerate the amine for re-use in contacting sour gas. The off-gas from the Amine Stripping Tower is sent to two (2) three-stage Claus sulfur recovery units (SRU's) to convert the H_2S into elemental sulfur. The Sulfur Recovery Units have the highest concentration of H_2S.

2.0 THE H_2S CONTINGENCY PLAN

2.1 Responsibility for Conformance with the H_2S Contingency Plan

It is the responsibility of all personnel onsite to follow the safety and emergency procedures outlined in the H_2S Contingency Plan, as well as the following documents:

- Navajo Refining Safety and Health Manual
- Navajo Refining Integrated Contingency Plan
- Navajo Refining Environmental Policies and Procedures
- Navajo Refining Operating Procedures

2.2 Revisions to the H_2S Contingency Plan

The H_2S Contingency Plan will be reviewed annually and revised as necessary to address changes to the facility, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected, especially those areas within the radii-of-exposure.

2.3 Availability of the H_2S Contingency Plan

The H_2S Contingency Plan will be available to all personnel responsible for implementation of the plan. A copy of the H_2S Contingency Plan will be available on the HollyFrontier Corporation intranet site (Flashpoint) and hard copies will be available in the Emergency Operations Center (EOC), Safety, Environmental, Plant Manager, Operations Manager, Maintenance, PSM offices and in each plant control room. See **Appendix H** for the H_2S Contingency Plan Distribution List.

2.4 Content of the H_2S Contingency Plan

As a minimum, the H_2S Contingency Plan will contain:

- The characteristics of H_2S and SO_2
- A facility description, map and/or drawings
- Emergency procedures to be followed in the event of a release of H_2S or SO_2 that may pose a threat to the refinery, public or public areas
- Information regarding training and drills to be conducted related to the H_2S Contingency Plan

3.0 H_2S Contingency Plan Design Considerations

3.1 Definitions

Immediately Dangerous to Life and Health (IDLH) - The atmospheric concentration of a toxic, corrosive or asphyxiant substance that creates an immediate threat to life or could cause irreversible or delayed adverse health effects, or could interfere with an individual's ability to escape from a dangerous atmosphere.

Parts per million (ppm) - A unit of measure, one equal part of a substance per one million equal parts of air.

Permissible Exposure Limit (PEL) - The employee's 8-hour time weighted average which shall not be exceeded at any time during a work day.

Short Term Exposure Level (STEL) - is the employee's 15-minute time weighted average, which shall not be exceeded at any time during a work day unless another time limit is specified.

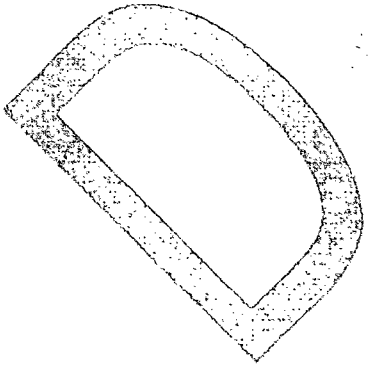
Time Weighted Average (TWA) - The employee's average airborne exposure in an 8-hour work shift of a 40-hour work week, which shall not be exceeded.

3.2 General Information

Hydrogen sulfide is a highly toxic, colorless and flammable gas which burns with a blue flame. When burned it produces SO_2 or sulfur dioxide which is also a poisonous gas. H_2S is slightly heavier than air, and is usually associated with the smell of rotten eggs. This strong and distinctive odor is evident at concentrations as little as 1 ppm. At high concentrations, the olfactory nerves become fatigued and paralyzed; therefore, the sense of smell shall never be used as the sole detector of H_2S. Respiratory protection guidelines must be stringently followed because inhalation is the primary route of exposure.

Generally, H_2S can be found in all plant areas that contain crude oil, refinery fuel gas, sour water or unit areas which remove and process H_2S and/or sulfur. H_2S containing process piping and equipment may be identified by H_2S warning signs. However, due to the close proximity of operating units and nature of the refining process, warning signs are not intended to indicate every potential H_2S area.

All personnel entering H_2S areas shall visually locate wind socks and note wind direction. If expected to do anything except evacuate immediately upon the onset of an alarm, they shall identify the location of Self Contained Breathing Apparatus (SCBA's) and be trained to use SCBA's. Supplied air equipment shall be used for initial opening of H_2S containing process equipment and/or piping. Be aware that there may be additional requirements for work in some areas in the facility, or for special work. Hot Work Permits and Confined Space Entry Permits are examples of such circumstances.



3.3 Hydrogen Sulfide

Hydrogen sulfide properties and characteristics are described in **Table 3**.

Table 3. H_2S Properties and Characteristics

CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Auto ignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues and nerves

3.3.1 H_2S Exposure Limits and Effects of Exposure

H_2S exposure limits and effects of exposure are described in **Table 4** and **Table 5**.

Table 4. H_2S Exposure Limits

OSHA PEL	20 ppm
OSHA Ceiling	50 ppm (10 minutes)
IDLH	100 ppm

Table 5. H_2S Affects of Exposure

Concentration	Effect
0.05 ppm	Rotten egg odor, detectable by most people.
0.13 - 30 ppm	Obvious and unpleasant odor.
50 - 150 ppm	Olfactory fatigue (temporary loss of smell) and marked dryness and irritation of the nose, throat and respiratory tract. Prolonged exposure may cause runny nose, cough, hoarseness, headache, nausea, shortness of breath, and severe lung damage (pulmonary edema).
200 - 250 ppm	Worsening and more rapid onset of the above health effects; possible death in 4 to 9 hours.
300 - 500 ppm	Excitement, severe headache and dizziness, staggering, loss of consciousness, respiratory failure likely in 5 minutes to an hour. Possible death in 30 minutes to 4 hours.
500+ ppm	Rapid onset of severe toxicity, respiratory paralysis, and death. If not fatal, may cause long-term effects such as memory loss, paralysis of facial muscles or nerve tissue damage.
800 - 1000 ppm	May be immediately fatal after one or more breaths, resulting in an instant unconsciousness or "knock-down" effect.

3.3.2 Personal Protective Equipment

Approved respiratory protection for H_2S at the Navajo Refinery shall consist of the following:

- SCBA (self-contained breathing apparatus)
- Supplied air-line respirator with 5 minute egress cylinder

3.3.3 Respiratory Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH (known concentration) - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA.

Unknown Concentrations of H_2S - For unknown concentrations of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

3.4 Sulfur Dioxide (SO_2)

Sulfur dioxide is produced as a by-product of H_2S combustion. It is colorless, transparent and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide properties and characteristics are described in **Table 6 and Table 7**.

Table 6. Sulfur Dioxide Properties and Characteristics

CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA (OSHA PEL)	5 ppm
STEL (NIOSH)	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

SO_2 exposure limits and effects of exposure are described in **Table 4.**

Table 7. Physical Effects of Sulfur Dioxide (SO_2)

Concentration	Effect
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life And Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly

3.5 RADII of Exposure (ROE)

RRS/Schirmer evaluated the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas for the worst case release scenario (as described in **Appendix A**) of H_2S gas for the Navajo refinery. The 100-ppm and 500-ppm ROE were calculated in compliance with API RP-55 and are shown in **Table 8**. The details of calculations, equations and other variables used to evaluate the ROE are discussed in Appendix B-Calculation for Radius of Exposure. A map showing 100-ppm and 500-ppm contours are contained in **Appendix C**.

Table 8. Radius of Exposure

Concentration of H_2S (ppm)	Distance (feet)
100	1505
500	771

4.0 EMERGENCY ACTION PROCEDURES

4.1 Emergency Response Organization

Navajo Refining Company utilizes the Incident Command System (ICS) to manage emergency response activities. The ICS is a management tool which is readily adaptable to very small incidents as well as those of considerable significance. The ICS shall be implemented for all discharge/release incidents with staffing levels adjusted as required to meet the specific needs as determined by the size and severity of the incident. Response to a discharge originating from the Facility will be provided by the Emergency Response Team.

4.1.1 Qualified Individual

The Refinery Vice President/Manager serves as Qualified Individual (QI) and the Operations Manager serves as the Alternate Qualified Individual (AQI). Arrangements are made to ensure that either one or the other is available on a 24-hour basis and is able to arrive at the Facility in a reasonable time. The AQI shall replace the QI in the event of his absence and have the same responsibilities and authority.

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Refinery Vice President/Manager, or his designee, will be the Emergency Operations Center (EOC) QI. The EOC QI will contact and coordinate response with HollyFrontier Corporation Management located in Dallas, Texas.

The Refinery Vice President/Manager (Emergency Operations Center QI) or his designee shall determine:

1. Affected Unit shutdowns
2. Isolation of refinery process units
3. Repairs, tests or unit startup as required

4.1.2 Emergency Response Team

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management.

The number of positions/personnel required to staff the Emergency Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the IC directly or delegated as the situation demands.

The IC is always responsible for directing the response activities and will assume the duties of all the primary positions until the duties can be delegated to other qualified personnel.

The Emergency Response Team is shown on the organization chart in **Figure 2**.

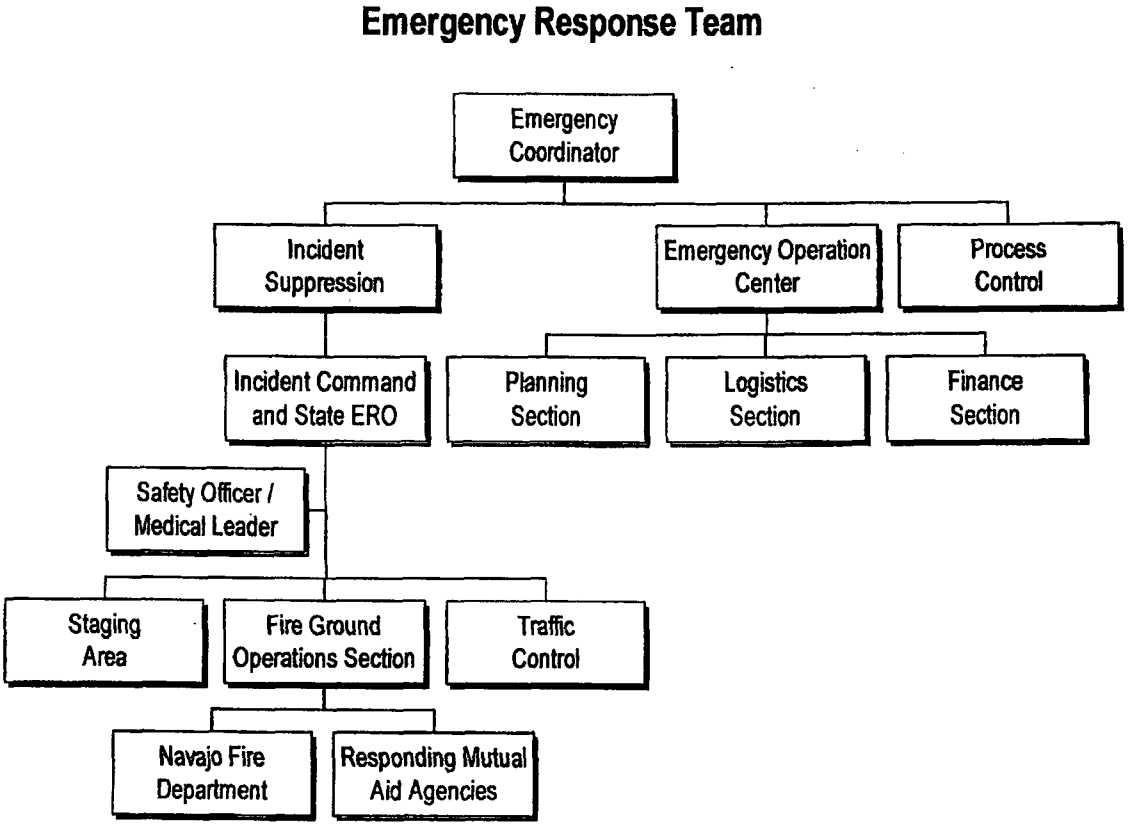


Figure 2. Emergency Response Team

4.2 Emergency Response

4.2.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

4.2.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

4.2.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's orientation program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Activating the Emergency Alarm System
- After receiving the emergency alarm, Central Dispatch (Security) will follow the appropriate procedure based on information received during the alarm notification.

4.2.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. The refinery has three (3) activation levels that are described below and in detail in the Response Flow Diagram in **Appendix F.**

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. **Without exception, refinery personnel and public safety is first priority.**

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management.

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills or releases that are contained on refinery property as opposed to spills or releases that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

NAVAJO LEVEL 1 RESPONSE: For H_2S releases contained on refinery property:

1. In the event a fixed monitor alarms at the first set point of **20 ppm**:
   - Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
   - Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
   - Operations personnel may remove any personnel using proper respiratory protection at their discretion.
   - Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

NAVAJO LEVEL 2 RESPONSE: For H_2S releases contained on refinery property:

1. In the event a fixed monitor alarms at the second set point of **50 ppm:**
   - Operations personnel shall contact and remove all personnel in the affected area(s).
   - Non-operations personnel shall remove themselves from the affected unit area(s). IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL FROM THE AFFECTED AREA(S), IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).
   - Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.
   - Wear appropriate respiratory protection if available.
   - Make note of wind direction and evacuate upwind or cross wind from the affected area(s).
   - Check in with Operations once outside the affected area(s).
2. First Aid/Rescue Procedures:
   - Activate the alarm.
   - Never attempt to rescue a downed victim without proper respiratory protection. Proper respiratory protection for rescue purposes is fresh air in the form of a SCBA or supplied air-line respirator with an emergency egress bottle.
   - Remove victim to fresh air. Check victim for breathing and pulse. If qualified, administer CPR as needed until help arrives.

NAVAJO LEVEL 3 RESPONSE for H_2S releases that have the potential to migrate off refinery property:

ACTIVATE THE H2S CONTINGENCY PLAN

1. For H_2S concentrations of 100 ppm or greater as measured at the refinery fence line:

- Operations personnel will activate the affected unit Emergency Shutdown
- Operations will activate the plant emergency alarm system by notifying Central Dispatch (Refinery Security)
- Notify the City of Artesia Police Dispatcher by calling 911 immediately and informing them of an H_2S release emergency
- Notify the Eddy County LEPC at 575-361-3404 and inform them of an H_2S release emergency
- Notify the National Response Center (NRC) at 800-476-9635 and inform them of an H_2S release emergency
- Within four hours of the H2S release, notify the NMOCD's Artesia District Office at 575-748-1283 x104 of the release
- Within four hours of the H2S release, notify the NMOCD's Santa Fe Office at 505-476-3490

The potential for a spill or vapor release to migrate out from refinery property is reduced since the Artesia refinery provides emergency shutdowns, Flares, mitigation (water deluge, foam systems to control vapors and emergency shutdown of the affected process units.), secondary containment protection through a process wastewater collection system from each process unit and loading area, and secondary containment dikes around the bulk storage tanks. However, in the unlikely event that discharges, including vapor releases, escape the confines of the facility, emergency procedures have been established.

2. When the City of Artesia has been notified of an H_2S release that may exceed 100 ppm in any defined public area (businesses, residences, schools, parks, etc.) and/or 500 ppm at any public road, the City will initiate the following actions as outlined in the City Of Artesia's **General Operating Order # OPR36, Unusual Occurrences:**

<u>CITY OF ARTESIA RESPONSE</u> To an H_2S release from the Navajo Refinery greater than 100 ppm:

OPR36.05 AUTHORITY FOR IMPLEMENTATION:

A. The authority for the implementation of the plans having to do with unusual occurrences lies with the Chief of Police or his designee.

OPR36.07 COMMAND POST:

A. During any unusual occurrence the Chief of Police or his designee directs the activities of the Department from a designated command post.

B. At least one competent employee should be assigned to the Chief of Police or other officer in charge in the Command Post to assist with administrative and communications functions.

C. Command Post entry will be restricted to authorized personnel only.

D. An appropriate number of personnel should be assigned to the unusual occurrence in order to accommodate the size and scope of it.

E. The federal Incident Command Structure system should be utilized as much as possible during unusual occurrences.

OPR36.09 EVACUATION OF CITIZENS:

A. Evacuation of persons should be a priority after the incident scene is secured.

B. Isolated and adjacent areas should be evacuated whenever conditions permit.

1. Removal of uninvolved persons not only insures their safety, but also greatly facilitates subsequent police action.

2. When possible, evacuees should be interviewed for any pertinent information about the scene or persons involved in the incident.

3. Mandatory evacuation of uninvolved persons is a legal difficulty. The attempt should be made and appropriate safety warnings issued, however, compliance is voluntary. In any case the warning given to persons choosing not to leave should be documented.

4. Injured civilian or police personnel should be evacuated from the area as soon as it is practical to do so. Refusals by injured civilians to be evacuated will be documented.

C. An alternative to removal may be a shelter or cover in place decision if removal would be more dangerous.

D. Communications:

1. During an emergency Channel One, which is the Department's primary radio channel, shall be designated for emergency traffic only until completion of the operation.

2. If required, the Emergency Command Post will be activated and communications established from the facility.

E. Situation Maps:

1. Maps should be maintained by the Department to be used during emergency situations to visually plot the emergency area.

2. City maps or building blueprints of schools or public buildings shall be obtained and made available at the command post.

F. Scene Commander:

1. The first supervisor on the scene immediately assumes command and is designated as Scene Commander until, or unless, relieved by a higher authority. It is the responsibility or the Scene Commander to:

a. Make a rapid survey of the scene and assess the seriousness of the situation.

b. Notify the staff through the Chain of Command of the current status of the situation to include the following:

i. Manpower needs;

ii. Route open to the scene;

iii. Location of a suitable staging area and parking area.

c. Establish a field command post and

i. Notify the Eddy County Central Communications Authority and the staff of the location of the unusual occurrence;

ii. Determine any communications available;

iii. Determine the specific equipment needed.

d. Supervise operations and maintain communications with the Eddy County Central Communications Authority.

G. Chain of Command:

1. During unusual occurrence, the established chain of command shall be strictly adhered to.

2. Other law enforcement agencies responding to aid the Department shall adhere to our established chain of command, unless otherwise directed by the Chief of Police.

H. Public information through media relations:

1. The purpose of effective public information dissemination is to maintain public confidence while keeping the public informed concerning any unusual occurrence.

2. The Department Public Information Officer is responsible to establish effective collection, control and dissemination of emergency public information, to minimize confusion, misinformation and for rumor control.

3. Area media agencies will be notified and a media information briefing point either in the vicinity of the occurrence or at the Department building in case of an area-wide occurrence. On a regular basis, information will be provided directly to media representatives by the designated media Relations Officer. All media agencies will be advised that no telephone inquiries will be responded to in order to reduce the burden on dispatchers and telephone lines.

J. Traffic Control:

1. Traffic control will be established as needed on the perimeter of the affected area to control access to the area, assist evacuation efforts and alleviate congestion.

2. The scope of certain disasters will dictate whether traffic control is an essential function and the priority at which it will be addressed. In circumstances where impact is limited in geographic area traffic control functions will be coordinated by police personnel, and may require support from and/or requests for mutual aid from other police agencies.

3. The Scene Commander is responsible to establish perimeters, sealing off the affected area, while routing traffic away from the location.

OPR36.18 MANMADE DISASTERS:

A. Employees should be prepared to establish relationships with other authorities and private businesses concerning manmade disasters and should be prepared to work with them to protect lives and property.

OPR36.19 SIGNALS CONCERNING MANMADE OR NATURAL DISASTERS:

A. Signals may be given by the City's early warning system. The system is also capable of delivering voice messages via public address. The system is controlled by Departments of the City and is available in situations that warrant its use. Additionally, a reverse 911 system is in place and may be used.

B. Signals may be given by the Navajo Emergency Alarm system. The following is a summary of these signals:

1. Whoop tone (sweeping low to high tone) signals an emergency condition in a Unit (I.e. fire, spill, **vapor release**, etc.).

2. Hi/lo tone (alternating high to low tone) signals a unit evacuation.

3. Alert tone (continuous siren tone) signals severe weather (tornado) alert.

4. All clear tone (single cycle of siren) signals the end of an emergency.

4.2.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate

- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

4.2.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums
- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

4.2.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid

gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 **the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO_2.**

Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined.

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

4.2.6 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at 20 ppm. A remote alarm is initiated in the control room along with local strobe lights and alarms located in the unit.

4.2.7 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and additional contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

4.2.8 Operations Field Monitoring of the Unit

The refinery has unit operators who "walk-down" the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

4.2.8.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external

notification and reporting obligations associated with the activation of this H_2S Contingency Plan.

4.2.8.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear personal H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel, while performing such work, discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm and vibrate at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

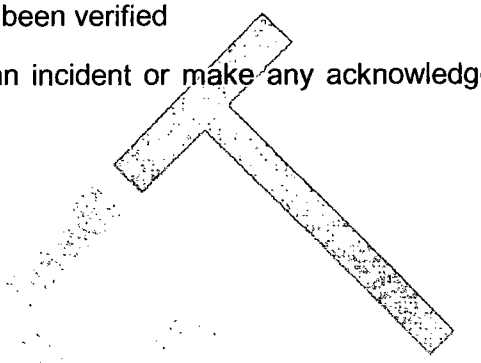
- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or strobe light, Plant operators are to contact their immediate supervisor for assistance and put on the SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the On Call Safety Representative, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.
- Once the On Call Safety Representative is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Refinery management will then conduct further reporting that is necessary based on the situation.

- Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

4.2.8.3 External Notification

The following guidelines should be remembered when reporting spills or vapor releases:

- Never include information that has not been verified
- Never speculate as to the cause of an incident or make any acknowledgement of liability
- Document:
  - Agency Notified
  - Date/Time of Notification
  - Person Notified
  - Content of Message Given
- DO NOT DELAY reporting due to incomplete information



Dialing 9-1-1 will connect to the Eddy County Central Communications Authority (ECCCA). This is Central Dispatch for all of Northern Eddy County (except for State Police) and serves the Eddy County Sheriff's Department, Artesia Police Department, Artesia Fire Department and Eddy County Fire Service.

Appendix G contains the Emergency Call List.

4.2.8.4 Site Security

The security measures in place for the Facility perimeter include fences and gates as follows:

- The refinery property is fully fenced and monitored by contract security guards 24 hours per day, 7 days per week.
- All plant entrances have issued card access gates or are staffed with guards 24 hours per day.
- The Facility is manned by operating personnel 24 hours per day, 7 days per week.

4.2.8.5 Sign and Markers

The refinery has warning signs indicating the presence of H_2S at the entrances to the refinery. Signs are located at the plant entrances indicating that all visitors are to proceed to the main gate located at the Freeman Street entrance to sign-in.

4.2.8.6 First-Aid Station

The first aid station will be located at the Emergency Assembly Area. First aid kits are located:

- All main office buildings
- Fire Station
- Warehouses
- Control Rooms

4.2.8.7 Media Site

If the H_2S Contingency Plan is activated, the Media Site will be located at the Artesia Chamber of Commerce Conference Room. An alternate media site will be established at the Artesia Fire Department Training Room if the Chamber of Commerce is not a suitable location.

At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

4.2.8.8 Emergency and Safety Equipment

There are 4 emergency response trailers at the Artesia Refinery. Three trailers are located at Holly Energy Partners office east of the refinery and one trailer is maintained inside the refinery boundary fence. A complete listing of the emergency response equipment is provided in **Appendix E.**

5.0 TRAINING

5.1 NRC Employees

All Navajo Refining employees, contractors and visitors shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Contractors are required to train their employees on all hazards that may exist in the jobs they are performing, including H_2S and SO_2 hazards.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas
- The person(s) are working in a plant area which contains no possible H_2S exposures

Training information and documentation will be maintained by the Safety Department.

5.2 NRC Employee Training

Navajo has designated a Safety Training Coordinator in light of the significant training and record keeping requirements by the many different government agencies (i.e., DOT, OSHA, EPA and various state and local agencies). The training coordinator's duties include conducting, training and maintaining records for all employees which documents the content of and the applicable regulatory requirement for the training. In addition to training records, the coordinator also maintains records of safety meetings and other meetings related to environmental regulations.

All employees who work in operating areas of the refinery or have the potential to be exposed to the operating areas receive initial New Employee training emphasizing occupational safety, environmental compliance and process safety management. Employees receive New Employee training at their initial employment and annual computer based training (CBT) refresher training thereafter to comply with requirements found in:

- 40 CFR 112.7(e) - SPCC Plan
- 40 CFR 112.21 - Facility Response Plan
- 40 CFR 262 - Hazardous Waste Contingency Plan

Common elements of all three of these programs include prevention, detection, and response to releases of oils and other hazardous materials. Training common to all three also includes emphasis on good housekeeping practices (Best Management Practices), secondary containment, and prompt initial notification of an incident.

5.3 Emergency Response Drills

- The Refinery will conduct, at least one table top drill annually and will include local Emergency Response Organizations (Artesia Police and Fire Departments and the LEPC). Multiple drills during the year may be scheduled at the discretion of the Plant Manager.
- The annual drill will exercise this Plan and include, at a minimum, contacting the City of Artesia Police and Fire Departments and the Local Emergency Planning

Commission (LEPC). The drills will include briefing officials on issues such as evacuation or shelter-in-place plans.

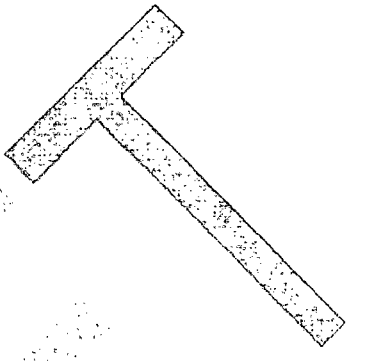
- Drill training will be documented and those records will be maintained at he Refinery. The documentation will include at a minimum the following:

  a) Description or scope of the drill, including date and time

  b) Attendees and participants in the drill

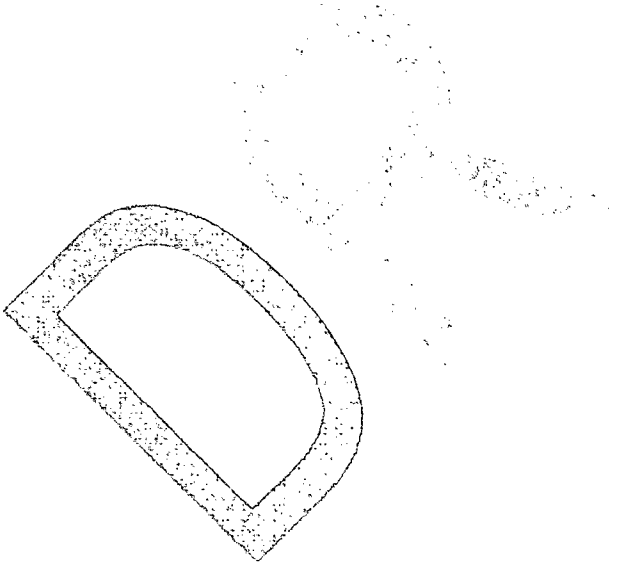
  c) Summary of activities and responses

  d) Post drill debrief and reviews



APPENDIX A

WORST CASE SCENARIO FOR H_2S RELEASE

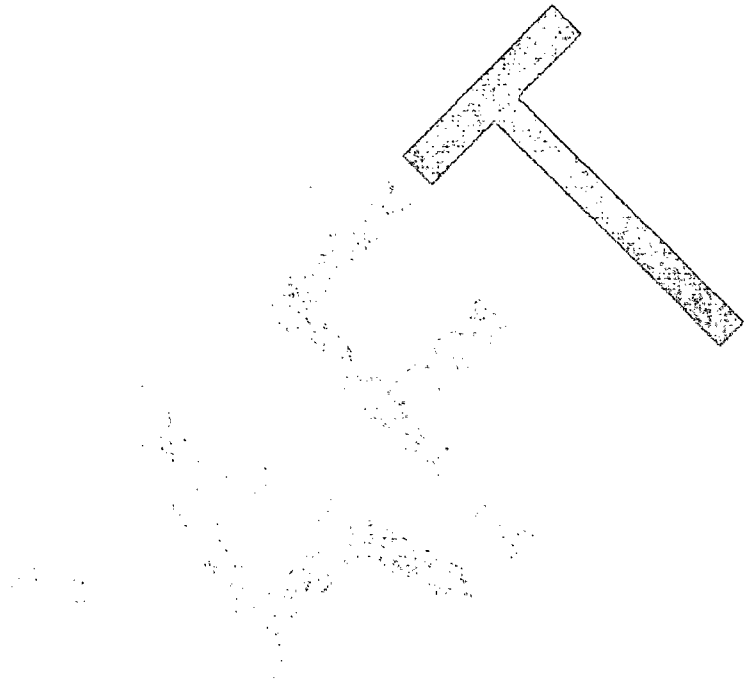


The worst case release scenario of H_2S gas is an instantaneous release of contents of the thermal reactor located in the Sulfur Recovery Unit.

The basis for the worst case calculations is the volume of the thermal reactor and the catalytic reactor (empty) is 5500 cubic feet (ft3) with approximately 2000 ft3 of support material and catalyst in the catalytic reactor. A 15 minute release is equivalent to approximately 25,000 ft3

APPENDIX B

CALCULATION FOR RADIUS OF EXPOSURE



To estimate the radius of exposure associated with an instantaneous release of H_2S due to the catastrophic rupture of a vessel, a calculation procedure from API RP-55, *Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide,* was adopted. The equation for predicting ROE for H_2S releases was taken from pg. 36 of Appendix C of API RP 55:

$$ROE = 10^{\left[A \times \log(H_2S) + B\right]} \quad \text{.....Equation 1}$$

Where ROE is H_2S radius of exposure, A and B coefficients contained in Table C-1 of API RP 55 (reprinted below), and $[H_2S]$ is the amount of H_2S released. For continuous release, the H_2S release rate in entered in standard cubic feet per hour (SCFH) and for a puff (instantaneous) release the quantity of H_2S is entered in standard cubic feet (SCF).

Table C-1—Linear Regression Coefficients for Mathematical Predictions of ROE as a Function of Downwind Hydrogen Sulfide Concentration and Release Quantity/Rate

Time*	Type of Release	Concentration, ppm	Coefficients A	Coefficients B
Day	Continuous	10	0.61	0.84
Day	Continuous	30	0.62	0.59
Day	Continuous	100	0.58	0.45
Day	Continuous	300	0.64	-0.08
Day	Continuous	500	0.64	-0.23
Night	Continuous	10	0.68	1.22
Night	Continuous	30	0.67	1.02
Night	Continuous	100	0.66	0.69
Night	Continuous	300	0.65	0.46
Night	Continuous	500	0.64	0.32
Day	Puff	10	0.39	2.23
Day	Puff	30	0.39	2.10
Day	Puff	100	0.39	1.91
Day	Puff	300	0.39	1.70
Day	Puff	500	0.40	1.61
Night	Puff	10	0.39	2.77
Night	Puff	30	0.39	2.60
Night	Puff	100	0.40	2.40
Night	Puff	300	0.40	2.20
Night	Puff	500	0.41	2.09

*Day Meteorological Conditions: Stability Class PG D (Neutral)—5 mph Wind Speed.
*Night Meteorological Conditions: Stability Class PG F (Stable)—2.2 mph Wind Speed.

The thermal reactor and the associated piping contain a total volume of 5,800 cubic feet. The composition of the stream exiting that vessel from the heat and material balance sheets is as shown below:

Component	Composition (lb moles/hr)	Composition Mole %
Nitrogen	766	56
Hydrogen	13	1
Carbon monoxide	3	0.2
Carbon dioxide	7	0.5
Water	364	26
Sulfur dioxide	40	3
Hydrogen sulfide	80	6
Carbon disulfide	0.15	<0.1
Carbonyl sulfide	0.44	<0.1
Sulfur disulfide	106	8
Total	1,380	100

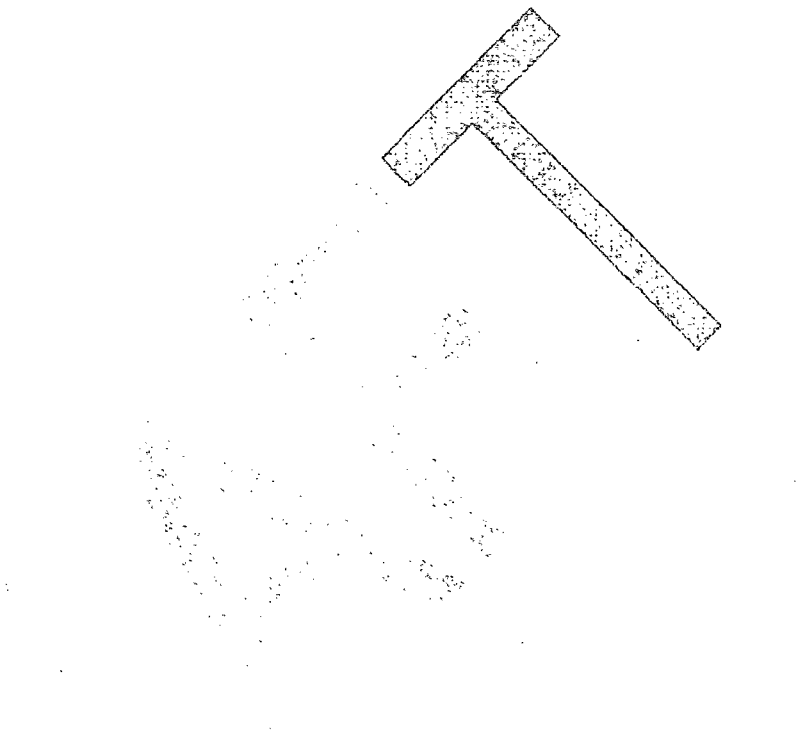
This stream was reported to be at a pressure of 20.6 psia and a temperature of 2416 degrees Fahrenheit. The composition of H_2S in the exiting stream is 6% by mole or volume fraction. Therefore, the maximum gaseous volume of H_2S in the vessel would be 6% of 5,800 cubic feet which is 348 cubic feet. At standard conditions of 14.73 psia and 60 degrees Fahrenheit, that volume would be equivalent to 88 SCF of H_2S. The coefficients A and B were taken from Table C-1 for night time conditions (to ensure the most conservative results), for puff releases (due to the instantaneous rupture scenario), and for 100 ppm and 500 ppm concentrations of interest. Radii of exposure for those two concentrations were calculated, as follows.

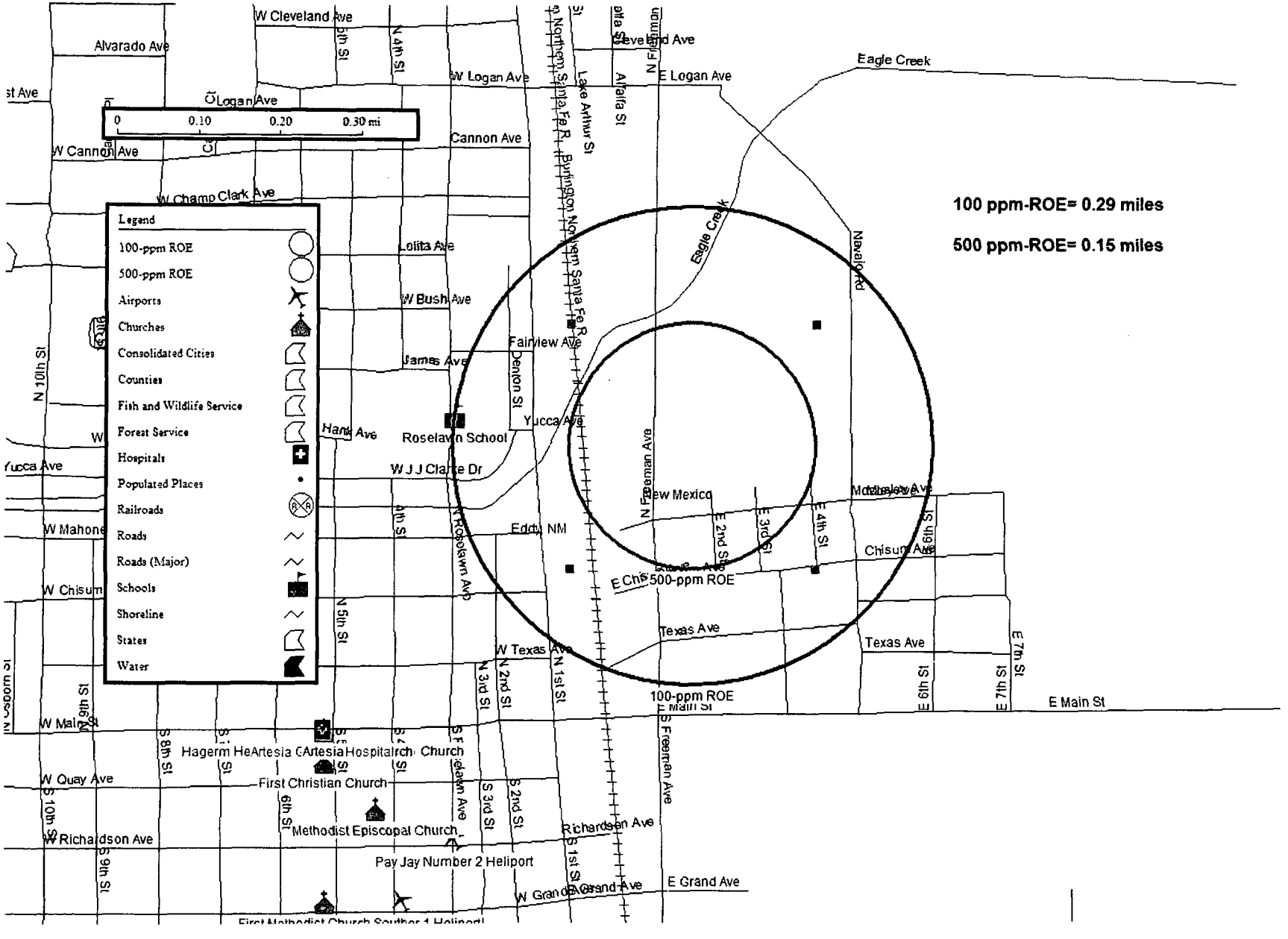
$$ROE - 100\,ppm = 10^{\left[0.40 \times \log(88) + 2.40\right]} = 1{,}505\,feet$$

$$ROE - 500\,ppm = 10^{\left[0.41 \times \log(88) + 2.09\right]} = 771\,feet$$

APPENDIX C

RADIUS OF EXPOSURE (ROE) MAP




100 ppm-ROE= 0.29 miles
500 ppm-ROE= 0.15 miles
100-ppm ROE
500-ppm ROE
Legend
100-ppm ROE
500-ppm ROE
Airports
Churches
Consolidated Cities
Counties
Fish and Wildlife Service
Forest Service
Hospitals
Populated Places
Railroads
Roads
Roads (Major)
Schools
Shoreline
States
Water
0 0.10 0.20 0.30 mi
W Cleveland Ave
Alvarado Ave
W Logan Ave
E Logan Ave
Cannon Ave
W Champ Clark Ave
Eagle Creek
Lolita Ave
W Bush Ave
James Ave
Fairview Ave
Denton St
Yucca Ave
Roselawn School
W J J Clarke Dr
New Mexico
Eddy NM
Chisum Ave
E Chisum Ave
Texas Ave
W Texas Ave
E Main St
W Main St
Artesia Hospital
Hagerman Church
First Christian Church
Methodist Episcopal Church
Pay Jay Number 2 Heliport
W Richardson Ave
Richardson Ave
W Quay Ave
E Grand Ave
W Grand Ave
Lake Arthur St
Alfalfa St
Navajo Rd
N Freeman Ave
S Freeman Ave
N Roselawn Ave
N 1st St
N 2nd St
N 3rd St
N 4th St
N 5th St
N 10th St
S 1st St
S 2nd St
S 3rd St
S 4th St
S 5th St
S 6th St
S 8th St
S 9th St
S 10th St
E 2nd St
E 3rd St
E 4th St
E 6th St
E 7th St

APPENDIX D

PLANT DIAGRAM - EVACUATION ROUTES, H_2S MONITORING AND ALARM LOCATIONS

APPENDIX E

DESCRIPTION OF EMERGENCY RESPONSE EQUIPMENT

1. **Portable Pumps** — **Location**
   1. Blue Diesel Pump — Waste Water Treatment Plant
   2. New Portable Pump — North of Main Warehouse
   3. Red Gasoline Driven Pump — Tanks 437 & 439

2. **Booms**
   1. Spill Kit (see item no. 6) — Warehouse #4

3. **Absorbents**
   1. Spill Kit — Warehouse #4
   2. Sphag-Sorb Pillows — Warehouse #4
   3. Bail of Peat Moss — Warehouse #4

4. **Hand Tools**

5. **Fire Fighting & Personnel Protective Equipment** - Operational Status: Good

Type & Year	Quantity	Storage Location
1980 Ford Mini Pumper w/125 GPM Scat Fire Apparatus Pump 50 gal. Foam Tank	1	Fire Station
1986 National Foam Pumper w/1250 GPM pump 500 GPM Deck Gun, 1000 gal. Foam Tank	1	Fire Station
Foam Trailer 1650 Gal.	1	Fire Station
National Foam 660 GPM Foam Tower	2	Fire Station
Portable Monitors	13	Fire Station

6. **Other** (e.g., Heavy Equipment, Boats, & Motors) - Operational Status: Good

Type & Year	Quantity	Storage Location
Front End Loader (1985 John Deere) 300B	1	Crane Shed N. of Main Whse.)
Vacuum Truck (1985 Mack)	1 70 barrel (bbl)	Crane Shed (N. of Main Whse.)
Lugger Bucket Truck	1	Crane Shed (N. of Main Whse.)

7. **Communication Equipment** - Operational Status: Good

Description	Quantity	Location
Telephones	205+	Throughout Facility
Base Radios	6	Throughout Facility
Portable Radios	56	Throughout Facility
Mobile Radios	22	Throughout Facility
Remote Radios	12	Throughout Facility
Pagers	19	Throughout Facility
Cellular Phones	11	Throughout Facility

8. **Cellular phones**

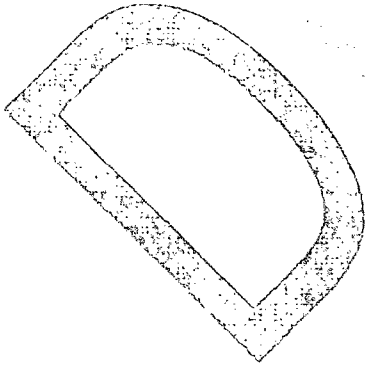
Cellular Phones Assigned To	Phone No.
Safety & Risk Manager, Steve Hollis	575-308-2817
Sr. Engineer Mgr (Jimmy Meeks)	575-308-8718
Sr. Maintenance Mgr (Trampas Spence)	575-365-5071
Sr. Operations Mgr (Robert Boans)	575-365-5930
Product Movement & Lab Mgr (David Latham)	575-746-5277
Refinery Mgr (Michael McKee)	575-308-4028
Inspection Mgr (Jeff Beauregard)	575-365-4237
Sr. Environmental Mgr (Mike Holder)	575-308-1115

9. **Emergency Response Trailer**

5 packages of Hot Hog boom 3" X 10'
2 shovels
1 rake
1 push broom
1 pry bar
¾ cu ft of sphag sorb
1 box of nitrile gloves
6 pair rubber boots various sizes
Several pair of cloth gloves
Several pair of rubber gloves
5 folding chairs
1 large water gel blanket
1 generator
2 rescue blankets
Caution tape
1 roll of black plastic
8 pair of goggles
1 box of ear plugs
1 folding ladder
6 slicker suits
2 portable lights
2 extension cords
2 – 4 inch tie down straps
2 – Full body harnesses
Various hand tools
Air drill
Sash cord
1 decontamination sprayer
Scrub brushes
Gas can

APPENDIX F

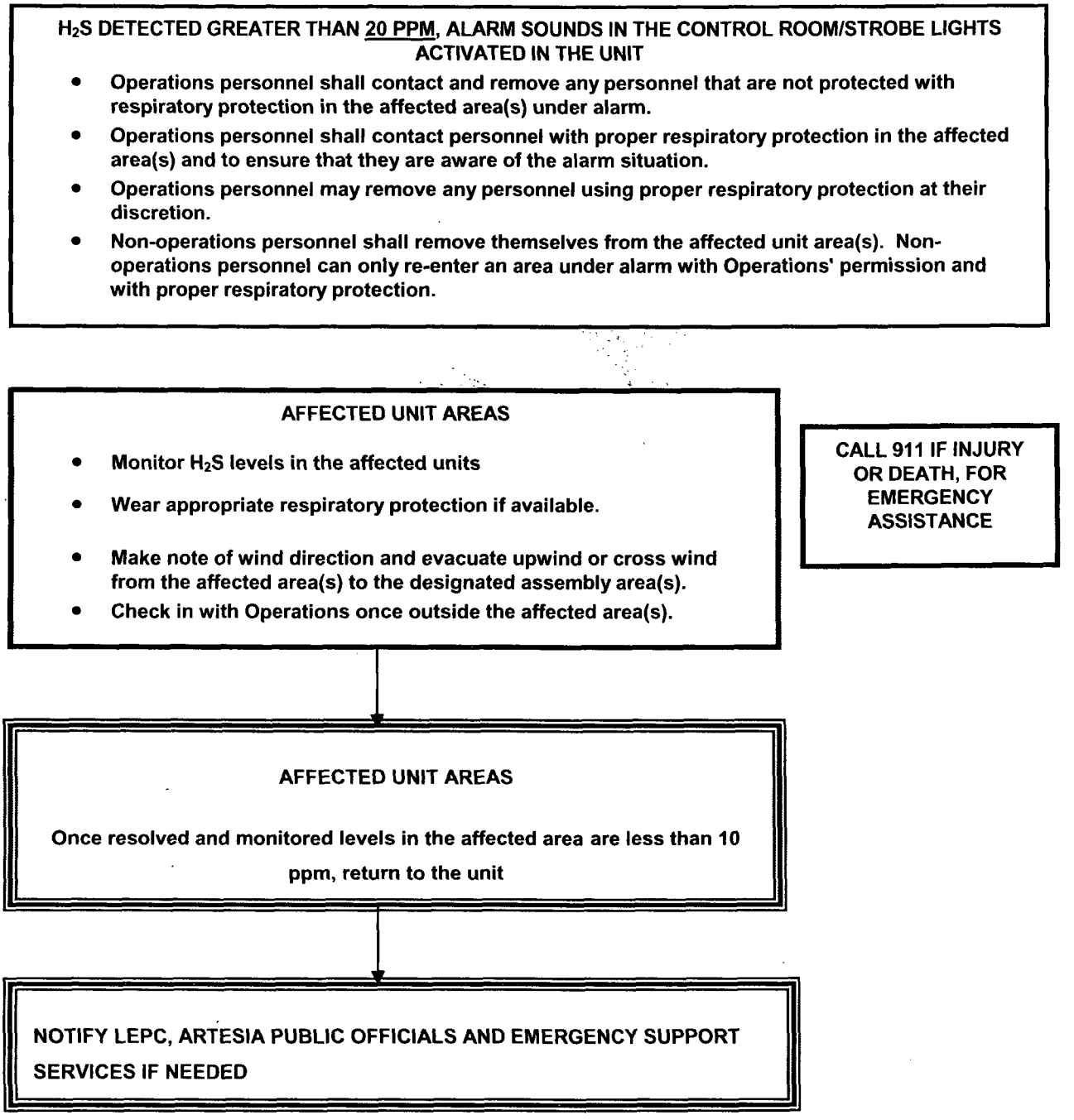
H_2S CONTINGENCY PLAN – FLOW DIAGRAM/H_2S DETECTION EQUIPMENT



APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 1 RESPONSE (Alarm Sounds in the control room and strobe lights activated at 20 PPM)



APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 2 RESPONSE (Alarm Sounds in the control room, affected unit and strobe lights activated at 50 PPM)

H_2S DETECTED GREATER THAN 50 PPM, ALARM SOUNDS IN THE CONTROL ROOM/AFFECTED UNIT/STROBE LIGHTS ACTIVATED IN THE UNIT

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.

AFFECTED UNIT AREAS

- Monitor H_2S levels in the affected units
- Wear appropriate respiratory protection if available.
- Make note of wind direction and evacuate upwind or cross wind from the affected area(s) to the designated assembly area(s).
- Check in with Operations once outside the affected area(s).

CALL 911 IF INJURY OR DEATH, FOR EMERGENCY ASSISTANCE

Once resolved and monitored levels in the affected area are less than 10 ppm, return to the unit

NOTIFY NMOCD WITHIN FOUR HOURS, MAKE AGENCY REPORTS AS PER H_2S PLAN IF THE PLAN IS ACTIVATED

APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 3 RESPONSE (WORST CASE SCENARIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION)

H_2S DETECTED GREATER THAN 100 PPM &/OR UNIT AUDIBLE ALARM SOUNDS/STROBE LIGHTS ACTIVATED

- **Operators will activate the affected unit ESD and activate the emergency alarm system**
- **Follow the Immediate Action Plan steps found in section 4.2.3.1 of the Artesia H_2S Contingency Plan**

CALL 911 IF INJURY OR DEATH, FOR EMERGENCY ASSISTANCE

ACTIVATE THE H_2S CONTINGENCY PLAN

NOTIFY LEPC, ARTESIA PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

NOTIFY NMOCD WITHIN FOUR HOURS, MAKE AGENCY REPORTS AS PER H2S PLAN

ONCE RESOLVED & MONITORED LEVELS IN THE AFFECTED UNIT ARE LESS THAN 10 PPM RETURN TO THE UNIT

H_2S Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH (known concentration) - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentration of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required.

Rescue of Another Person - For rescue purposes, SCBA shall be the only form of respiratory protection used.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

Detection - Personal Monitoring Equipment

Personal H_2S monitors used in the facility should alarm at 10 ppm. Monitors may or may not have direct reading capabilities. Employees should wear a personal H_2S monitor at all times when working in the process units and Blender/Tank Farm locations. The monitors should be worn within the "breathing zone", unobstructed by clothing or equipment and such that the employee can readily perceive the alarms. The breathing zone is a 1.5-foot radius in all directions centered at the nose and mouth.

Alarm protocol

If a personal monitor alarms at the low alarm (PEL), personnel must leave the area and obtain supplied air equipment to complete the work task.

Detection - Fixed Monitoring Equipment

Fixed H_2S monitors are located in the refinery in the North Plant and the CCR. The fixed H_2S monitors have two alarm set points. The alarm set points and responses are as follows:

- First set point: 20 ppm
    - Response: Activates alarm in the control rooms
- Second set point: 50 ppm
    - Response: Activates alarm in the control room. Activates strobe lights and an audible alarm in affected unit area(s).

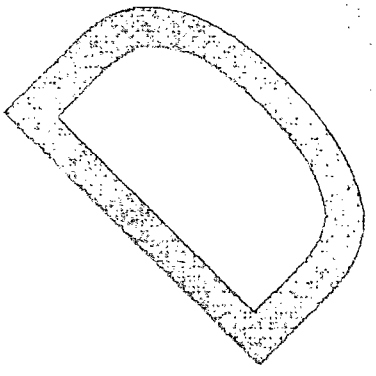
Alarm protocol:

In the event a fixed monitor alarms at the first set point of 20 ppm:

- Operations personnel shall contact and remove any personnel that are not protected with proper respiratory protection in the affected area(s) under alarm.
- Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
- Operations personnel may remove any personnel using proper respiratory protection at their discretion.
- Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

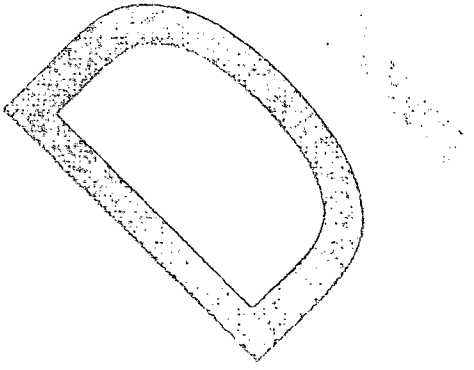
In the event a fixed monitor alarms at the second set point of 50 ppm:

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). **IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).**
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.



APPENDIX G

EMERGENCY CALL LIST



Navajo Refining Internal Notifications

Organization	Name	Office	Cell
Emergency Coordinator Refinery VP/Manager (Qualified Individual):	Michael McKee	(575) 748-3311 ext. 361	(575) 308-4028
Alternate Qualified Individual Manager, Operations	Robert Boans	(575) 748-3311 ext. 248	(575) 365-5930
Incident Commander Safety & Risk Manager:	Steve Hollis	(575) 748-3311 ext. 780	(575) 308-2817
Fire Chief	King Kelley	(575) 748-3311 ext. 465	(575) 365-7508
Safety Officer/Medical Officer Safety Department	Kent Bratcher	(575) 748-3311 ext. 410	(575) 308-7348
Environmental Specialist for Water and Waste	Micki Schultz	(575) 746-5281	(575) 308-2141
Logistics Section Maintenance Director	Trampas Spence	(575) 738-3311 ext. 395	(575) 365-5071
Asst. Maintenance Supervisor	Bill Romine	(575) 748-3311 ext. 472	(575) 703-5910
Planning Section Maintenance Director	Trampas Spence	(575) 738-3311 ext. 395	(575) 365-5071
Logistics Section Maintenance Department Coordinator	Lael Ramirez	(575) 748-3311 ext. 342	(575) 513-1788
Finance Section Purchasing Department	Bob Bailey	(575) 748-3311 ext. 671	(575) 365-6071
Finance Section – Expediter Purchasing Department	Jon Ross	(575) 748-3311 ext. 325	(575) 365-4244

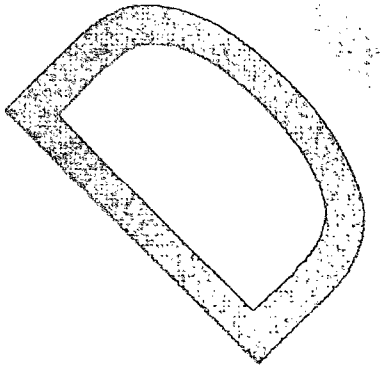
Note: Personnel will also be notified by the Holly Emergency Notification System (an automated call service to the individuals' cell phone).

Navajo Refining External Notifications

Required External Notifications			
Agency	**Location**	**Office**	**Alternate**
National Response Center (NRC)	Washington, D.C.	(800) 424-8802	(202) 267-2675
Roswell State Police (SERC)	Roswell, NM	(575) 827-9223	(575) 622-7200
NM Energy, Minerals, and Natural Resources Department (OCD)	Artesia, NM (District 2)	(575) 748-1283	
Local Emergency Planning Committee (LEPC)	Carlsbad, NM	(575) 887-9511	(575) 887-7551
Assistance/Advisory Notifications (outside resources)			
Agency	**Location**	**Office**	**Alternate**
New Mexico Department of Game and Fish	Roswell, NM	(575) 624-6135	(575) 748-3036
New Mexico OSHA Bureau	Santa Fe, NM	(575) 827-2888	
OSHA (For Reportable Injury or Death)	Washington, D.C.	(800) 321-6724	
U.S. Environmental Protection Agency (EPA) Region VI	Dallas, TX	(800) 887-6063	(214) 665-2200
U.S. Fish and Wildlife Services (USFWS)	Albuquerque, NM	(505) 346-2525	
Bureau of Land Management (BLM)	Santa Fe, NM	(505) 438-7501	
New Mexico Health and Environmental Department	Santa Fe, NM	(505) 827-3723	
New Mexico Fire Marshal	Roswell, NM	(575) 347-5700	
National Weather Service (Recorded Forecasts) (NOAA)	Roswell, NM	(575) 347-5700	
Local Water Supply System	Artesia, NM	(575) 746-2122	(575) 746-2703
Local Emergency Services			
Agency	**Location**	**Office**	**Alternate**
Artesia Fire Department	Artesia, NM	911	(575) 746-5051
Eddy County Sheriff	Artesia, NM	911	(575) 746-9888
Artesia City Police	Artesia, NM	911	(575) 746-5000
Artesia Ambulance	Artesia, NM	911	(575) 746-5050
Artesia General Hospital	Artesia, NM	(575) 748-3333	(575) 736-8350 ER
Eastern New Mexico Medical Center	Roswell, NM	(575) 622-1110	
Guadalupe Medical Center	Carlsbad, NM	(575) 887-4100	

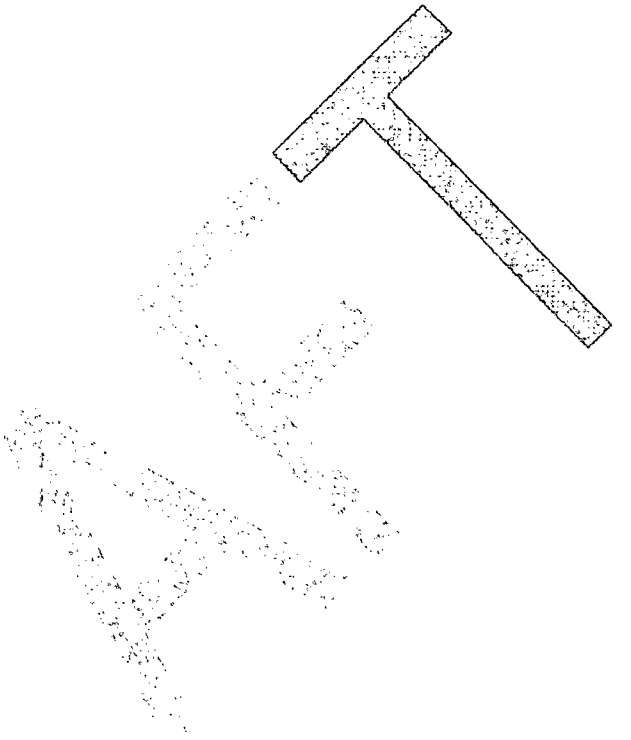
Other Emergency Resources

Oil Spill Removal Organizations (OSRO)			
Company	**Location**	**Office**	**Alternate**
TAS Environmental Services, Inc.	Fort Worth, TX	(888) 654-0111	(800) 442-7637
Additional Response Recourses			
Company	**Location**	**Office**	**Alternate**
Indian Fire & Safety	Artesia, NM	(575) 393-3093	(800) 530-8693
I/W Hot Oil - Transport Service	Artesia, NM	(575) 746-4214	
Gandy Corporation - Transports Service	Lovington, NM	(575) 396-4948	
Jim's Water Service - Transports Service	Artesia, NM	(575) 748-1352	(575) 748-1352
O.K. Hot Oil	Loco Hills, NM	(575) 746-6233	
Swett Construction - Dirt Equipment	Artesia, NM	(575) 748-1238	
T&C Tank Rental - Temporary Storage	Artesia, NM	(575) 746-9788	
International Bird Rescue Center	Fairfield, CA	(707) 207-0380	
Tri-State Bird Rescue	Newark, NJ	(302) 737-9543	
KBIM - TV	Roswell, NM	(575) 622-2120	
KSVP - AM Radio	Artesia, NM	(575) 746-2751	



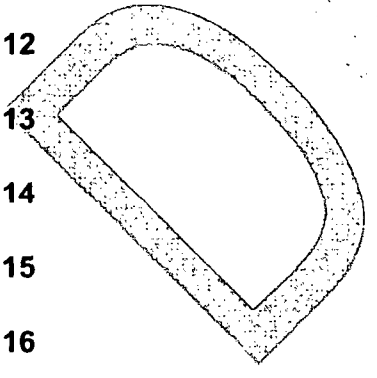
APPENDIX H

H_2S PLAN DISTRIBUTION LIST



DISTRIBUTION

COPY #	LOCATION
1	EOC
2	SAFETY LIBRARY
3	ENVIRONMENTAL FILE ROOM
4	ENVIRONMENTAL MANAGER
5	PLANT MANAGER
6	OPERATIONS MANAGER
7	MAINTENANCE OFFICE
8	PSM COORDINATOR
9	NORTH CONTROL ROOM
10	SOUTH CONTROL ROOM
11	CORPORATE EH&S
12	NMOCD SANTA FE
13	NMOCD ARTESIA
14	EDDY COUNTY LEPC
15	ARTESIA FIRE DEPT.
16	ARTESIA POLICE DEPT.
17	ARTESIA GENERAL HOSPITAL



Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, May 23, 2012 9:30 AM
To: 'Lackey, Johnny'
Cc: VonGonten, Glenn, EMNRD; Holder, Mike; McKee, Michael; Dade, Randy, EMNRD
Subject: RE: NAVAJO H2S CP SCHEDULE

Johnny:

The OCD has completed its review of the attached schedule for implementation.

The OCD hereby approves the schedule with revisions to applicable sections of the H2S Contingency Plan (CP) and will expect to receive the revised CP by COB Monday June 25, 2012.

Please contact me if you have questions. Thank you.

File: OCD Online "GW-028 H2S Contingency Plan" Thumbnail

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
Website: http://www.emnrd.state.nm.us/ocd/
"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

---

From: Lackey, Johnny [mailto:Johnny.Lackey@hollyfrontier.com]
Sent: Thursday, May 17, 2012 4:53 PM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Holder, Mike; McKee, Michael
Subject: NAVAJO H2S CP SCHEDULE

Carl;

As we discussed, attached is Navajo's schedule for completing the H2S Contingency Plan required by NMAC Title 19 Chapter 15 Part 11, Hydrogen Sulfide Gas. I have made the requested additions to Sections 2.3 and 5 and updated contact lists and dates.

I will need Navajo management and legal to approve the changes before submitting the Plan and will schedule a meeting with the Artesia Police and Fire Departments to discuss the changes.

Thanks,

Johnny Lackey
Sr. Environmental Manager
The HollyFrontier Companies

P.O. Box 159
501 E. Main St.
Artesia, NM 88211-0159
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollyfrontier.com

May 17, 2012

Schedule for Navajo H2S Contingency Plan (CP) Implementation

May 25, 2012. Submit the amended H2S CP to Navajo Management and Legal Department for review.

June 11, 2012. Schedule a meeting during this week with Artesia Police and Fire Departments to:

- Review Plan changes and updates.
- Agree with City officials on a schedule and content for mass mailings to the Artesia citizens describing the plan availability, hazards of H2S, notification procedure and shelter in place instructions (Include this with the water bill in English and Spanish). These mass mailings will most likely be sent with the **August 2012** water bills.
- Coordinate with City officials the dates, times and location to conduct public training. Pending OCD approval of the Plan, we will schedule the training in September of this year (School administrators and teachers will be available during this time frame). The LEPC and Federal Law Enforcement Training Center (FLETC) will also be included in this training. Training content will be developed with the City to correspond with the City's Emergency Response Plan.
- Discuss how to make the plan available to the public. Previous discussions suggested copies can be available at the city hall, library, the city's web site and the OCD's website.

June 25, 2012. Submit Navajo H2S Contingency Plan to the OCD for review and final approval (After meeting with the City to incorporate their comments and/or suggestions).

July 16, 2012 (Pending OCD final approval). During this week schedule a table top drill with the City of Artesia simulating a worst case H2S release and activation of the H2S CP.

August 2012. Send the H2S CP "flyer" with the monthly water bill to Artesia residents that would be affected by a H2S release from Navajo's Refinery.

September 17, 2012. During this week, conduct the first Town Hall Meeting/Training (Date, time and location will be included in the August water bill mailings) to discuss the contents of the CP with the public. Additional public meetings will be scheduled as needed.

Johnny Lackey
Environmental Manager
575-746-5490

Chavez, Carl J, EMNRD

From: Lackey, Johnny <Johnny.Lackey@hollyfrontier.com>
Sent: Thursday, May 17, 2012 4:53 PM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Holder, Mike; McKee, Michael
Subject: NAVAJO H2S CP SCHEDULE
Attachments: 5 17 12 H2S CP Schedule For Implementation.doc

Carl;

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Thanks,

Johnny Lackey
Sr. Environmental Manager
The HollyFrontier Companies
P.O. Box 159
501 E. Main St.
Artesia, NM 88211-0159
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollyfrontier.com

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June 25, 2012. Submit Navajo H2S Contingency Plan to the OCD for review and final approval (After meeting with the City to incorporate their comments and/or suggestions).

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September 17, 2012. During this week, conduct the first Town Hall Meeting/Training (Date, time and location will be included in the August water bill mailings) to discuss the contents of the CP with the public. Additional public meetings will be scheduled as needed.

Johnny Lackey
Environmental Manager
575-746-5490

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, May 09, 2012 2:48 PM
To: VonGonten, Glenn, EMNRD
Cc: Lackey, Johnny (Johnny.Lackey@hollyfrontier.com)
Subject: RE: navajo h2s cp

Glenn:

I spoke with Johnny Lackey and Mike Holder about the H2S CP. Johnny indicated that he will be retiring at the end of the year, and is working to train a newly hired replacement, Mike who will be his replacement. Johnny indicated that he would likely be assigned to complete this project.

It appears that the last communication on the H2S CP was August 18, 2011 between the Navajo and the OCD. Johnny pointed out that it was during the discharge permit application process where the OCD was removing non-WQCC discharge permit and/or oil and gas regulated provisions from the new OCD permits that likely caused the delay in addressing the public training provision.

Consequently, after reviewing the OCD Online (GW-028) H2S CP thumbnail with historic communications on the H2S CP and what is needed to address the "Public Training" aspect of the H2S CP, Johnny agreed to send the OCD by COB on 5/18/2012 a H2S CP Project Schedule for OCD approval to complete this provision in order to satisfy the OCD H2S Regulations.

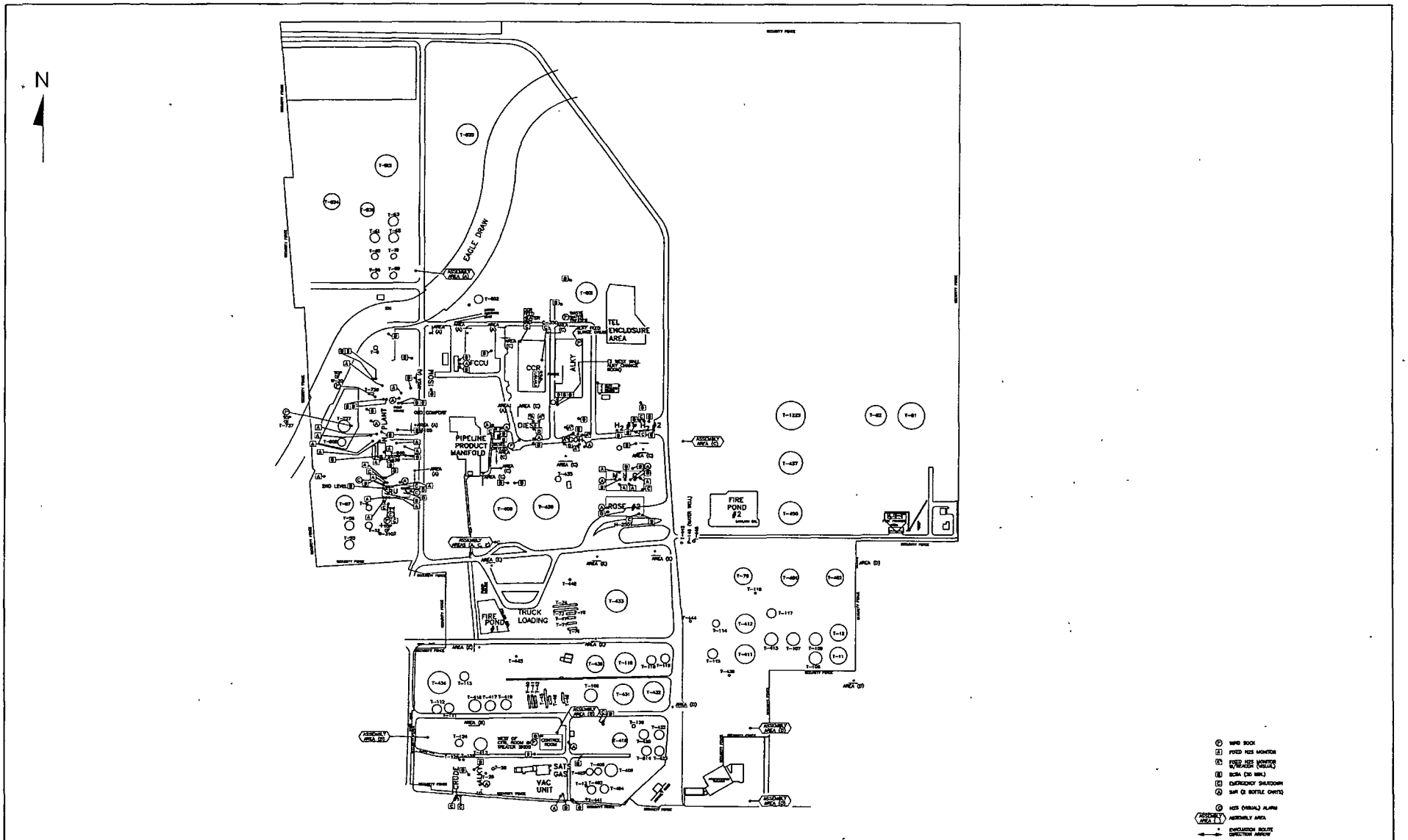
Please contact me if you have questions. Thank you.

From: VonGonten, Glenn, EMNRD
Sent: Wednesday, May 09, 2012 9:56 AM
To: Chavez, Carl J, EMNRD
Subject: navajo h2s cp

Carl,

Did Navajo ever respond to request for an update on the h2s cp?

Glenn von Gonten
Senior Hydrologist
Environmental Bureau
Oil Conservation Division
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3488
Fax-476-3462
glenn.vongonten@state.nm.us
http://www.emnrd.state.nm.us/ocd/



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
A1	REVIEW AND COMMENT	TSF		9/30/10		

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

DRAWING TITLE

H2S CONTINGENCY PLAN
NAVAJO
REFINING COMPANY
ARTESIA, NEW MEXICO

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	DATE BY	SCALE
GM		1"=185'-0"
DATE	APPR BY	DRAWING NUMBER / REV.
3-3-92		55-Z-55-D-01 A

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, August 18, 2011 11:35 AM
To: 'Lackey, Johnny'
Cc: VonGonten, Glenn, EMNRD
Subject: FW: Artesia Refinery (GW-028) Public Training Notice H2S Contingency Plan OCD Draft Review
Attachments: Navajo Artesia H2S CP 10 29 10.pdf

Johnny:

Subsequent to our telephone conference call yesterday and communication on the H2S Contingency Plan and the final remaining public training issue.

Please submit and addendum to the H2S Contingency Plan (September 2010) and applicable sections, i.e., Section 2.3 (Availability of the H2S CP) and Section 5 (Training and Drills) that will address this issue.

Thank you for your cooperation in this matter.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, October 29, 2010 11:38 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

Attached is the Navajo Artesia Refinery's H2S Contingency Plan for your review. A hard copy, to your attention, was sent yesterday via FedEx Priority Overnight delivery, Tracking Number: 4347 1018 6681.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 28, 2010 8:11 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Re: **Navajo, in cooperation with City of Artesia Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010**

Johnny:

Approved. Please submit a completed H2S Contingency Plan in hardcopy to the OCD by the above date.

If you would like to share your draft emergency response measures and any pertinent diagrams with Randy Dade and I before October 29, 2010, the OCD would be glad to review and comment.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 23, 2010 5:24 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Please see responses below. (Red Font).

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 14, 2010 11:02 AM
To: Lackey, Johnny

Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response and has also reviewed Navajo Refining Company's (NRC) H2S Contingency Plan (CP) applicable sections to determine the cause of NRC's concern(s) about public training. The OCD now understands what the problem is. NRC must revise and properly reference its "H2S Contingency Plan", "Emergency Response Section" and/or Initial Response Actions" sections of its CP to provide a detailed procedures and steps that it will take in the event of a release of H2S. This is what NRC must present to the general public along with applicable diagrams to educate the public on what NRC along with other applicable agencies will do in the event of an emergency.

OCD observations stemming from our recent communiqués on concerns about public training and review of NRC's H2S Contingency Plan are as follows:

1) Appendix D is missing the "Plant Diagram- evacuation routes, H2S Monitoring and Alarm Locations". This must be presented to the general public; and therefore, the H2S CP needs to be revised to include this diagram.
The diagram was included with the H2S CP submitted in an email to the OCD dated 3/31/10 file "Navajo H2S CP Plot Plan.pdf". The plot plan was submitted as a separate file due to illegibility if scanned with the plan. The plot plan clearly shows PLANT evacuation routes, location of all wind socks, fixed H2S monitor locations; the alarm settings for the fixed monitors are detailed in the Plan as well as actions to take if these alarm levels are triggered. Navajo has no plot plan of the city's escape routes, monitors, wind socks, or alarm settings. Navajo is working with the city to determine what is in place and needs to be included in Navajo's Plan. The city has a plan "ARTESIA POLICE DEPARTMENT GENERAL OPERATING ORDER# OPR36 UNUSUAL OCCURRENCES" which addresses some of the OCD's concerns regarding public notice, protection, evacuation, etc. and will be implemented as needed. This will be included in the training that is being developed for the public.

2) Page 12 Section 1.13.3.1 "Initial Response Actions" references Appendix F (H2S Contingency Plan Response), which references "Emergency Response Section." Neither section contain detailed response actions that must be taken by NRC responders in the event of an emergency situation with potential for migration of poisonous vapors offsite.
The actions required are outlined in Section 1.13.3 and Appendix F. Navajo met with Artesia City Emergency Responders on 7/15/10 to discuss their role regarding public protection. Further meetings will be scheduled with the City Council and Responders to develop an "off site" response plan, public notification, training etc. to be conducted as a joint effort between Navajo and the city of Artesia officials and responders.

3) Page 17, second bullet from the top references the "H2S Plan." The H2S Plan is not included with the report.
I'm looking at page 17 of the Plan and I don't see the reference???

4) Appendix F, Page F-3 "Emergency Procedures" indicates that emergency procedures for fire, facility evacuation, earthquake, etc. shall be followed as outlined in the Emergency Response Plan; however, neither section provides detailed emergency procedures listed for the worker or general public to understand exactly what measures will be taken by NRC.
Navajo is working with the City Emergency Responders to develop guidelines for the public to follow in the event of a worst case release of H2S from the Navajo Refinery. This has to be a joint effort with the approval of the Artesia City Council, which will include Public Notice and Training. The above referenced emergency procedures pertain to actions taken by plant employees to control the release with detailed actions found in the Refinery Emergency Plan. (A separate plan to protect refinery personnel and equipment). One step is to notify city officials if the emergency could impact the public at which time the city Emergency Responders' will take steps necessary to notify the public, control traffic, order shelter in place, evacuate if necessary. As stated before, Navajo is working diligently with city officials to develop plans to protect the public. This is ongoing and will take some time to develop.

In NRC's response e-mail below, Section 1.1.3.1 "Initial Response Actions" does not list detailed response actions. For example, who does what, what steps are taken A-Z in any plan with local and state agencies listed where appropriate based on the response steps. NRC does not specify in detail what it will do in the event of an emergency. There is very little discussion on a vapor release scenario and what action steps would occur, i.e., NRC discusses facility vs. releases that may migrate off property.

This will be addressed in the revision.

OCD also reviewed the API-55 document, which contains sections, i.e., Section 7 Contingency Planning Including Emergency Procedures, **which NRC must follow**. The H2S CP was developed to help NRC with emergency action steps to protect workers and the general public.
API RP 55 is a guidance document only and clearly states in the "Forword" that "It is intended that these voluntary recommended practices serve as a guide to promote and maintain integrity of oil and/or gas producing and gas processing facilities in the interest of public safety, personnel safety and protection of the environment." "This publication, or portions thereof, cannot be substituted for qualified technical/operations analysis and judgment to fit a specific situation". This Recommended Practice was developed for oil and gas operations and gas processing facilities. Refining is not mentioned in the document. However, Navajo did use this Guide as a reference for developing the Plan. No where does it state that a facility "Must Follow" these guidelines. In fact the API's disclaimer in the "Special Notes" and "Foreword" make it clear that this document is for use as a guide and "makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability ....."

From this point on, and in accordance with the OCD's May 4, 2010 e-mail where it reserves the right to modify and change the H2S CP in cooperation with the NRC, and where the NRC H2S CP has a provision for amendments as needed to the CP, please provide a date for completion of the above revisions to the H2S CP in order for the NRC and OCD to move forward to address the public training requirement by close of business on Friday, July 23, 2010. The OCD believes that the above amendments will provide the NRC with the public training materials needed to address the public training aspect of the H2S Regulations.
Navajo, in cooperation with City of Lovington Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010, assuming we can schedule timely meetings with the City Council, present our proposals, and get consensus on the Plan revisions, notification options, training required, schedule for training, etc.

An annual mass mailing with information and diagrams to persons living within a certain distance from the refinery may be another option for the NRC if it is still concerned about a voluntary public notice process through a newspaper, public meeting, etc.
These options were discussed at the meeting on 7/15/10 and the appropriate method will be presented in the Plan revision.

Please contact me if you have questions. Thank you.

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(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 09, 2010 4:46 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

See response below.

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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 07, 2010 8:07 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response to the OCD's July 2, 2010 e-mail communiqué associated with the above subject.

The OCD has become more concerned based on your responses, i.e., "The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds." It would appear based on your responses that Navajo Refining Company's (NRC) emergency measures are in need of revision?

How did you come to that conclusion? The rule states:

*"19.15.11.16 NOTIFICATION OF THE DIVISION: **The person 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 supersede notification.** The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release. [19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]" What's wrong with our response??*

From the H2S CP that was submitted and approved by the OCD:

1.1 Emergency Response

1.1.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1.1.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

1.1.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's training program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Immediately notifying Central Dispatch by:
  - Activating the Emergency Alarm System
  - Announce twice over the operating channel for that location "(type of emergency) at (location)" *(Local emergency responders monitor the Navajo Safety Radio Channel).*
  - Once the alarm is received, the alarm point will be contacted by Central Dispatch to verify the problem and gather any additional information about the situation. The person responsible for sounding the alarm should use this opportunity to tell Central Dispatch where the emergency is and the nature of the emergency (i.e., fire, spill, H_2S release)
  - After verifying the alarm, Central Dispatch will follow the appropriate procedure based on information received during the alarm verification

1.1.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. Response actions contained in Appendix F.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. Without exception, personnel and public safety is first priority.

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management. *(Keep in mind the plant is staffed 24 hours a day, 365 days per year and plant operations personnel will be the First Responders to any emergency release).*

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills or releases that are contained on refinery property as opposed to spills or releases that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

The potential for a spill or vapor release to migrate out from refinery property is reduced since the Artesia refinery provides emergency shutdowns, Flares, mitigation (water deluge, foam systems, etc.), secondary containment protection through a process wastewater collection system from each process unit and loading area, and secondary containment dikes around the bulk storage tanks. Based on the site topography, spills from the site flow northeast and the northeastern perimeter earthen bank is approximately eight feet high. These structures in conjunction with the diversion swale along the south face of Eagle Draw, flat slopes on-site, and a desert environment combine to effectively contain most spills on facility property. However, in the unlikely event that discharges escape the confines of the facility, emergency procedures have been established. Vapor releases are minimized by flaring, reducing charge rates, water deluge systems, foam application to control vapors and emergency shutdown of the affected process.

1.1.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate
- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

1.1.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums

- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

1.1.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO2.

Acid gas flaring will be initiated when the SRUs are unable to treat acid gas. The Amine Regeneration (Steam Reboiled Strippers) is equipped with a pressure control valve with a set-point higher than normal operating pressure of the stripper. With the acid gas blocked during a SRU trip, the pressure on the Stripper will increase until the pressure control valve set-point to flare is exceeded. The Stripper will then begin to send acid gas to the flare to maintain the pressure of the Stripper. Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined. Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

1.1.6 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at 20 ppm. A remote alarm is initiated in the control room along with local beacons and alarms located in the unit.

1.1.7 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

1.1.8 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

1.1.8.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external notification and reporting obligations associated

with the activation of this H_2S Contingency Plan. Internal notifications should be made for each emergency incident to the extent that the incident demands as described on the checklists provided as Table 4.

1.1.8.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If the Plant personnel detects H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Safety Manager, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.
- Once the Safety Manager is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Refinery management will then conduct further reporting that is necessary based on the situation.
- Plant personnel are to advise any contractor, Service Company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

Why is this in need of revision so soon after approval??

The purpose of the H2S Contingency Plan (CP) is for NRC to develop a CP that would outline measures taken in the event of a major release of H2S that could adversely affect nearby public areas. All that is remaining for NRC to do is to train the public on its CP and who does what in the event of an emergency.

These are excerpts from our July 2, 2010 earlier response: "Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the

training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's."

"The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo."

"Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP."

Therefore, the OCD requires that NRC make a determination on whether it needs to update its emergency measures sections of its CP by COB on Friday, July 9, 2010. If not, NRC should provide an outline of how it proposes to train the general public on its completed CP. If revisions are needed, NRC needs to provide the OCD with a deadline for completion of the updates that will include a date and time for a public training or information meeting to discuss its completed CP emergency measures with the general public to satisfy the intent of the H2S Regulations.

Navajo's determination is that the Plan does not need updating at this time. On May 4, 2010 you wrote:

Johnny:

The plan that Navajo submitted meets the intent of the OCD regulations. OCD reserves the right to modify and change it in cooperation with Navajo.

Please contact me if you have questions or feel you have not satisfied the intent of the regulations. Thank you.

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(Pollution Prevention Guidance is under "Publications")

As stated previously, Navajo is in the process of scheduling a meeting with Artesia City officials and responders to develop the necessary public awareness training regarding an H2S release from the refinery that may exceed the 100 ppm limit, thus triggering activation of the H2S Contingency Plan. (See attached email Meeting Notice).

Again:

"Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including

OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's."

"The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo."

"Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP."

Once Navajo and the Artesia city officials have met and developed a public meeting/training agenda, time and location, a copy will be submitted to the OCD. I can't speak for the city of Artesia on this issue. It has to be a mutual agreement between Navajo and the city of Artesia before we arbitrarily call a meeting of the citizens of Artesia and stumble through this important issue without forethought and preparation.

Please note that Navajo has no authority beyond our fence boundary to dictate to the city how they should conduct their emergency response actions. The Rule only states that:
"....and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans".

Navajo will work diligently with the local emergency response organizations to inform, provide support, and coordinate responsibilities and resources in the event activation of the Plan is necessary.

Since NRC has put together its CP with lists of emergency information and contacts, the above should make your meeting straight forward on what you need to train the public about. As you mentioned the refinery has more safety measures than ever, this should highlighted when you discuss the contents of your CP with the public. Thank you.

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(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Tuesday, July 06, 2010 11:32 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

See Navajo's response below.

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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, July 02, 2010 3:41 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Good afternoon. The OCD had perceived from the most recent meetings and communiqués on the above subject with Navajo Refining Company (NRC) that NRC and OCD had identified to use of the public notice as a process for soliciting or peaking the interest of the public or community for the public training requirements of the H2S Regulations for the facility.

Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's. It is anticipated that the ERO's will receive the highest volume of follow-up inquiries (concerns, notifications, fears, etc.). The public notice as it was being developed could have created undue public concerns. The wording suggested by OCD indicates the 'worst case scenario' is imminent. Nothing similar to the 'worst case H2S release scenario' has happened at Navajo in the 41 years since the company was established. In addition, the refinery has many more early warning and mitigation systems in place than ever before, so the likelihood of the 'worst case scenario' is much less likely than it has been in the past. Therefore, information and training must be prepared with a well thought approach by persons with appropriate expertise to prevent creation of unwarranted fears within the public sector. The intent is to inform, not cause alarm.

It is my understanding that NRC and OCD were both aware that the public notice process was not a regulatory requirement, but a path forward process for developing public training interest and to satisfy the H2S Regulations public training requirement. The OCD is on board with NRC in order to meet the public training requirement, but feels based on your message that you are now cutting off communications with the OCD and are attempting to move on your own path to satisfy the OCD H2S Regulations. OCD had indicated that due to the proximity of the public areas and ROEs calculated by NRC in its H2S Contingency Plan for the facility that a public meeting was imminent to make sure the public is informed, trained to know what to do and what will happen in the event of an H2S worse case release scenario that would threaten the safety of the community.

There is no intent to exclude the OCD from this process. As mentioned above, OCD was included in the meeting with city officials to discuss the plan. The Rule gives direction to the company for implementing requirements within the plan as necessary. The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds. Navajo fully intends to work with the city officials to provide training and notification to the public. The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo.

It appears based on your message below that NRC is uncomfortable with the public notice process and seems to indicate that OCD required it. This is not correct. Therefore, NRC is still obligated to satisfy the H2S Public Training Requirement in the OCD Regulations with the OCD. Based on your reply, "Navajo has no further comment and will work closely with Artesia Public officials to 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."

The "no further comment" statement was referencing OCD's comments to the Public Notice Draft that was submitted. As stated, after further review the public notice is not required and Navajo was under the impression from our previous meeting that this was a requirement from OCD and was proceeding accordingly. Yes, NRC is uncomfortable with a public notice via newspaper ad especially without inclusion of the local public officials who will be required to respond to perceived as well as actual emergencies.

The OCD hereby requires NRC to provide it with its new training agenda by a date agreed to by the OCD and NRC to satisfy the OCD H2S Regulations and specifically the "Public Training" provision. Please contact me by next Wednesday so we can communicate on NRC's new plans to educate the public and protect public safety based on the H2S Contingency Plan developed by the NRC.

Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP. Navajo is awaiting response from city officials. Nothing in the rule or API 55 guidance requires companies to furnish the Bureau with training agendas, content or a date to submit this information.

The OCD wishes to communicate and work with NRC to our mutual satisfaction as long as we can meet the intent of the OCD H2S Regulations. Thank you.

Mutual satisfaction must include the local public officials and ERO's.

File: OCD Online GW-028 "H2S Contingency Plan"

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From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 02, 2010 3:14 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

After further review and research, Navajo finds no directive in rule 19.15.11, Hydrogen Sulfide Gas or in API Recommended Practice 55 that requires the company to provide notice to the general public regarding H2S Contingency Plans. The Rule you cited in an earlier email (20.6.2.3108) is a requirement for application for a discharge permit, modification or renewal; therefore, Navajo has no further comment and will work closely with Artesia Public officials "to 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".

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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, June 22, 2010 4:10 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Please find attached OCD's comments on Navajo Refinery's draft public notice. I think some of the items Randy Dade mentioned in his e-mail below should be incorporated into what happens when the contingency plan is activated. Remember that the public needs to be training on what would happen in a worse case scenario so they will know how to react and what to do in the event of a major H2S release to the community.

I had commented that we should just post a public meeting date, time and location to discuss the H2S Contingency Plan Emergency Procedures. Perhaps the meeting could be termed, "H2S Contingency Plan & Public Training Meeting" to satisfy the H2S Regulations.

Please contact me to discuss or resend another draft to Randy and I by COB next Friday, July 2, 2010.

Thank you for your cooperation in this matter.

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Website: http://www.emnrd.state.nm.us/ocd/index.htm
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From: Dade, Randy, EMNRD
Sent: Tuesday, June 22, 2010 1:54 PM
To: Chavez, Carl J, EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

It was brought up at the meeting that at the public meeting, both the fire and police departments would be represented. It was also mentioned that all persons in the affected area that had telephone landlines would be notified by reverse 911. Navajo also mentioned setting up a phone system to take calls and leave comments during the initial public notice. I don't have any comments yet. I would like to read the final draft before it goes public. If there is anything else, give me a call, Randy.

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 22, 2010 1:07 PM
To: Dade, Randy, EMNRD

Cc: VonGonten, Glenn, EMNRD
Subject: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Randy:

Here are my comments. Do you have any? I want to send our draft back to Johnny and let them send us another one to look at....

I think we should also indicate in the end that a public meeting will be scheduled....? Should we schedule a date and time for the public meeting in the public notice to give the location, date and time of the meeting.....

Give me a call to discuss. Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

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Chavez, Carl J, EMNRD

From: Lackey, Johnny [Johnny.Lackey@hollycorp.com]
Sent: Friday, October 29, 2010 11:38 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review
Attachments: Navajo Artesia H2S CP 10 29 10.pdf

Carl:

Attached is the Navajo Artesia Refinery's H2S Contingency Plan for your review. A hard copy, to your attention, was sent yesterday via FedEx Priority Overnight delivery, Tracking Number: 4347 1018 6681.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 28, 2010 8:11 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Re: **Navajo, in cooperation with City of Artesia Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010**

Johnny:

Approved. Please submit a completed H2S Contingency Plan in hardcopy to the OCD by the above date.

If you would like to share your draft emergency response measures and any pertinent diagrams with Randy Dade and I before October 29, 2010, the OCD would be glad to review and comment.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us

Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 23, 2010 5:24 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Please see responses below. (Red Font).

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 14, 2010 11:02 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response and has also reviewed Navajo Refining Company's (NRC) H2S Contingency Plan (CP) applicable sections to determine the cause of NRC's concern(s) about public training. The OCD now understands what the problem is. NRC must revise and properly reference its "H2S Contingency Plan", "Emergency Response Section" and/or Initial Response Actions" sections of its CP to provide a detailed procedures and steps that it will take in the event of a release of H2S. This is what NRC must present to the general public along with applicable diagrams to educate the public on what NRC along with other applicable agencies will do in the event of an emergency.

OCD observations stemming from our recent communiqués on concerns about public training and review of NRC's H2S Contingency Plan are as follows:

1) Appendix D is missing the "Plant Diagram- evacuation routes, H2S Monitoring and Alarm Locations". This must be presented to the general public; and therefore, the H2S CP needs to be revised to include this diagram.

The diagram was included with the H2S CP submitted in an email to the OCD dated 3/31/10 file "Navajo H2S CP Plot Plan.pdf". The plot plan was submitted as a separate file due to illegibility if scanned with the plan. The plot plan clearly shows PLANT evacuation routes, location of all wind socks, fixed H2S monitor locations; the alarm settings for the fixed monitors are detailed in the Plan as well as actions to take if these alarm levels are triggered. Navajo has no plot plan of the city's escape routes, monitors, wind socks, or alarm settings. Navajo is working with the city to determine what is in place and needs to be included in Navajo's Plan. The city has a plan "ARTESIA POLICE DEPARTMENT GENERAL OPERATING ORDER# OPR36 UNUSUAL OCCURRENCES" which addresses some of the OCD's concerns regarding public notice, protection, evacuation, etc. and will be implemented as needed. This will be included in the training that is being developed for the public.

REFINING COMPANY, LLC

RECEIVED OCD

FAX
(575) 746-5283 DIV. ORDERS
(575) 746-5481 TRUCKING
(575) 746-5458 PERSONNEL

501 EAST MAIN STREET • P.O. BOX 159
ARTESIA, NEW MEXICO 88211-0159
TELEPHONE (575) 748-3311

2010 OCT 29 A 11: 05

FAX
(575) 746-5419 ACCOUNTING
(575) 746-5451 ENV/PURCH/MKTG
(575) 746-5421 ENGINEERING

October 28, 2010

FedEx Overnight Delivery

Carl Chavez, CHMN
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Navajo Refining Company, L.L.C., Artesia Refinery Hydrogen Sulfide Contingency Plan

Carl:

Enclosed is Navajo's Artesia, New Mexico Refinery FINAL H_2S Contingency Plan for your review/comment/approval. I will be sending an electronic copy of the plan via email.

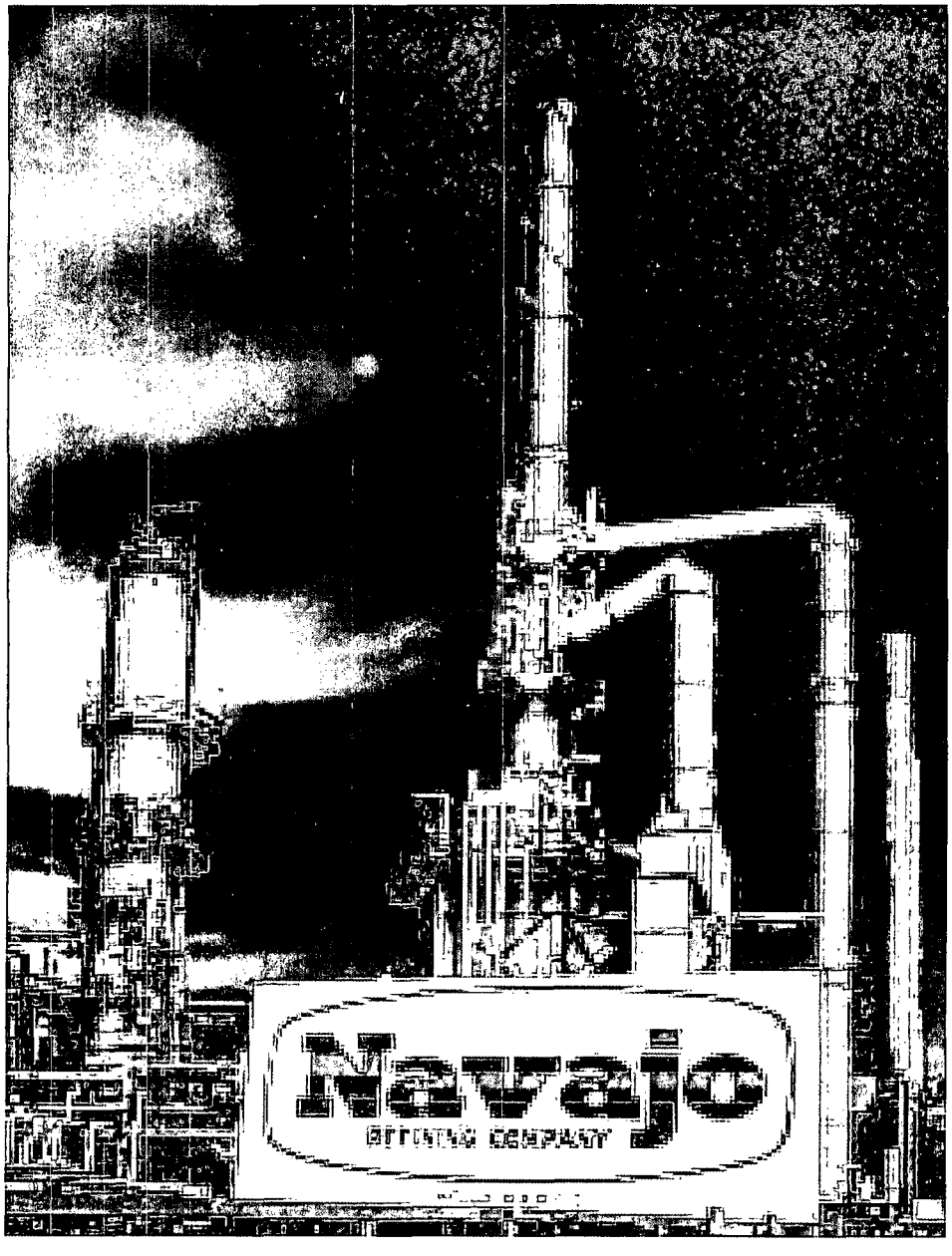
Please contact me at 575-746-5490 if you have any questions.

Sincerely,

Johnny Lackey
Environmental Manager

Enclosure

Navajo Refining Company
Artesia, NM



H2S Contingency Plan

Navajo Refining Company

Artesia Refinery

Artesia, New Mexico

September 2010

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ARTESIA REFINERY
NAVAJO REFINING

1.0 INTRODUCTION

The facility is a petroleum refinery which processes crude oil into asphalt, diesel fuel, naphtha, gasoline, kerosene, and liquefied petroleum gas (LPG). This facility:

- Processes crude at a combined rate of 100,000 barrels per day (bbls/day)
- Receives ~ 40,000 bbls/day of this volume from the Lovington Refinery
- Has an approximate total storage capacity of 1,300,000 barrels (bbls)
- Has an average storage volume of 500,000 to 750,000 bbls

Loading/unloading operations are conducted on a 24 hour, seven (7) day per week basis. The loading/unloading operations are listed in **Table 1**.

Table 1. Loading and Unloading Operations

Truck Loading	Truck Unloading	Rail Car Loading	Rail Car Unloading
Asphalt	Asphalt	Asphalt	LPG
Carbon Black Oil	Gas Oil	Carbon Black Oil	
Diesel Fuel/Gasoline	Crude Oil	Diesel Fuel	
LPG	Bulk Chemicals	Slurry	

1.1 Plant Description and Map

The Navajo Refinery is located in Artesia, Eddy County, New Mexico. It is owned and operated by Navajo Refining Company, a wholly owned subsidiary of Holly Corporation. **Table 2** provides details on Navajo Refinery's location.

Table 2. Navajo Refinery Location

Physical Address:	501 E. Main Street, Artesia, NM 88211-0159
Mailing Address:	P.O. Box 159, Artesia, NM 88211-0159
Latitude:	32.842 N
Longitude:	-104.391 W

The location of the Navajo Refinery is illustrated in **Figure 1**.

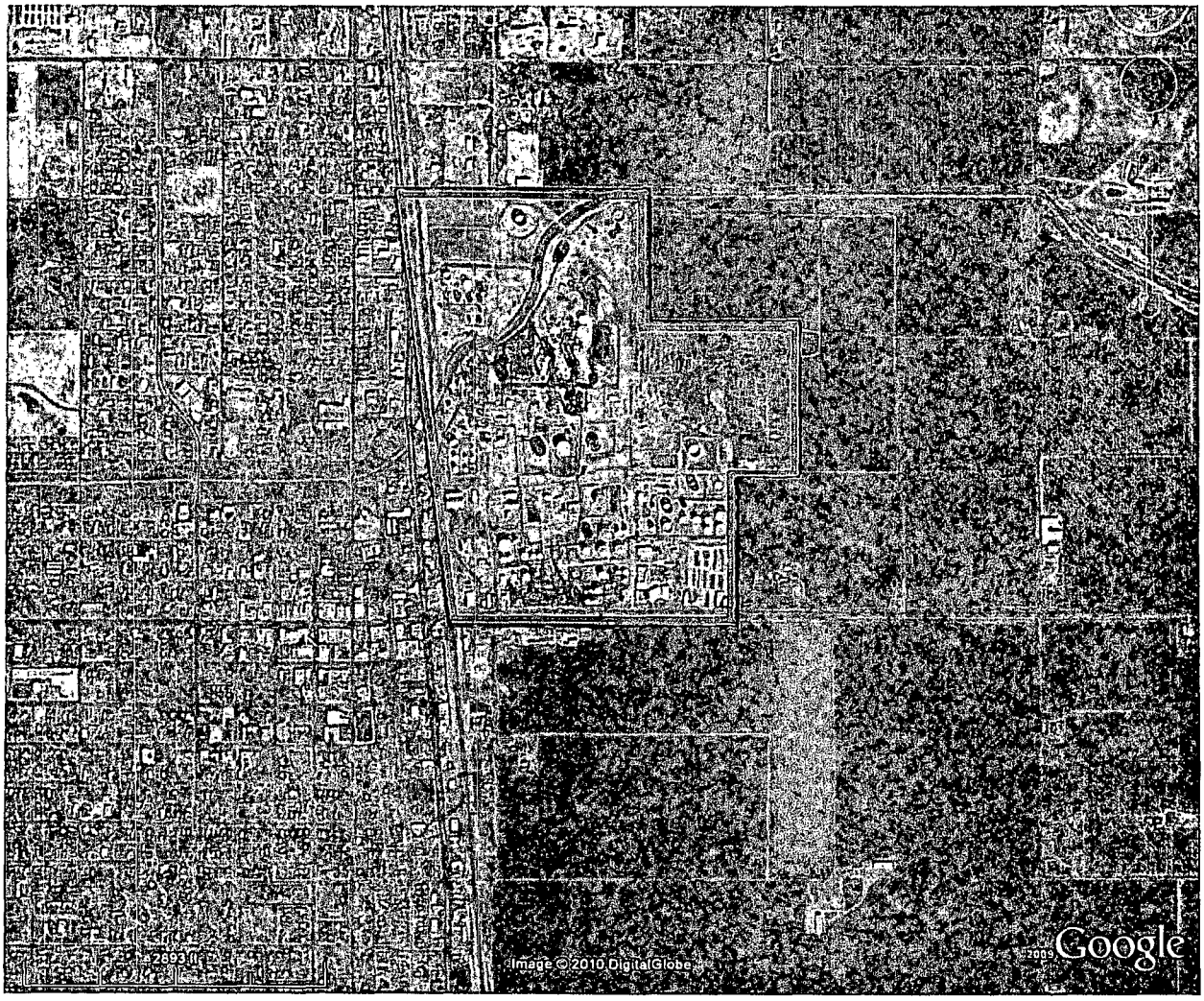


Figure 1. Location of Navajo Refinery (Approximate Boundaries)

1.2 Description of Operations

The Navajo Artesia refinery processes crude oil as well as intermediates received from outside sources such as Navajo's Lovington, NM refinery and other third-party sources. Crude oil and intermediates are purchased as needed or as justified on an economic basis. The crude oil and other intermediates enter the Artesia refinery via pipeline, truck, or rail. The Artesia refinery produces butane, propane, liquefied petroleum gas (LPG), jet fuels, kerosenes, diesel fuels, various grades of gasoline, carbon black oil (CBO), gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia refinery produces refinery fuel gas, hydrogen, nitrogen, and steam. The combined facility charge capacity is approximately 100,000 bbl/ day.

H_2S is produced by processing (primarily by hydrogen de-sulfurization) products distilled from crude oil, naphtha, kerosene, diesel, and gas oils at the Artesia Refinery. Small amounts of H_2S are present in crude oil and are recovered during distillation into fuel gas. Sour gas streams produced by processing and sour fuel gas from the crude unit are contacted with amine to recover H_2S from sour gas streams. The amine solution that absorbs the H_2S is circulated to a steam re-boiled Stripping Tower to regenerate the amine for re-use in contacting sour gas. The off-gas from the Amine Stripping Tower is sent to two (2) three-stage Claus sulfur recovery units (SRU's) to convert the H_2S into elemental sulfur. The Sulfur Recovery Units have the highest concentration of H_2S.

2.0 THE H_2S CONTINGENCY PLAN

2.1 Responsibility for Conformance with the H_2S Contingency Plan

It is the responsibility of all personnel onsite to follow the safety and emergency procedures outlined in the H_2S Contingency Plan, as well as the following documents:

- Navajo Refining Safety and Health Manual
- Navajo Refining Integrated Contingency Plan
- Navajo Refining Environmental Policies and Procedures
- Navajo Refining Operating Procedures

2.2 Revisions to the H_2S Contingency Plan

The H_2S Contingency Plan will be reviewed annually and revised as necessary to address changes to the facility, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected, especially those areas within the radii-of-exposure.

2.3 Availability of the H_2S Contingency Plan

The H_2S Contingency Plan will be available to all personnel responsible for implementation of the plan. A copy of the H_2S Contingency Plan will be available on the Holly Corp intranet site (Flashpoint) and hard copies will be available in the Emergency Operations Center (EOC), Safety, Environmental, Plant Manager, Operations Manager, Maintenance, PSM offices and in each plant control room. See **Appendix H** for the H_2S Contingency Plan Distribution List.

2.4 Content of the H_2S Contingency Plan

As a minimum, the H_2S Contingency Plan will contain:

- The characteristics of H_2S and SO_2
- A facility description, map and/or drawings
- Emergency procedures to be followed in the event of a release of H_2S or SO_2 that may pose a threat to the refinery, public or public areas
- Information regarding training and drills to be conducted related to the H_2S Contingency Plan

3.0 H_2S Contingency Plan Design Considerations

3.1 Definitions

Immediately Dangerous to Life and Health (IDLH) - The atmospheric concentration of a toxic, corrosive or asphyxiant substance that creates an immediate threat to life or could cause irreversible or delayed adverse health effects, or could interfere with an individual's ability to escape from a dangerous atmosphere.

Parts per million (ppm) - A unit of measure, one equal part of a substance per one million equal parts of air.

Permissible Exposure Limit (PEL) - The employee's 8-hour time weighted average which shall not be exceeded at any time during a work day.

Short Term Exposure Level (STEL) - is the employee's 15-minute time weighted average, which shall not be exceeded at any time during a work day unless another time limit is specified.

Time Weighted Average (TWA) - The employee's average airborne exposure in an 8-hour work shift of a 40-hour work week, which shall not be exceeded.

3.2 General Information

Hydrogen sulfide is a highly toxic, colorless and flammable gas which burns with a blue flame. When burned it produces SO_2 or sulfur dioxide which is also a poisonous gas. H_2S is slightly heavier than air, and is usually associated with the smell of rotten eggs. This strong and distinctive odor is evident at concentrations as little as 1 ppm. At high concentrations, the olfactory nerves become fatigued and paralyzed; therefore, the sense of smell shall never be used as the sole detector of H_2S. Respiratory protection guidelines must be stringently followed because inhalation is the primary route of exposure.

Generally, H_2S can be found in all plant areas that contain crude oil, refinery fuel gas, sour water or unit areas which remove and process H_2S and/or sulfur. H_2S containing process piping and equipment may be identified by H_2S warning signs. However, due to the close proximity of operating units and nature of the refining process, warning signs are not intended to indicate every potential H_2S area.

All personnel entering H_2S areas shall visually locate wind socks and note wind direction. If expected to do anything except evacuate immediately upon the onset of an alarm, they shall identify the location of SCBA's and be trained to use 30-minute SCBA's. Fresh air equipment shall be used for initial opening of H_2S containing process equipment and/or piping. Be aware that there may be additional requirements for work in some areas in the facility, or for special work. Hot Work Permits and Confined Space Entry Permits are examples of such circumstances.

3.3 Hydrogen Sulfide

Hydrogen sulfide properties and characteristics are described in **Table 3**.

Table 3. H_2S Properties and Characteristics

CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Auto ignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues and nerves

3.3.1 H_2S Exposure Limits and Effects of Exposure

H_2S exposure limits and effects of exposure are described in **Table 4** and **Table 5**.

Table 4. H_2S Exposure Limits

PEL	10 ppm
STEL	15 ppm
IDLH	100 ppm

Table 5. H_2S Affects of Exposure

Concentration	Effect
0.05 ppm	Rotten egg odor, detectable by most people.
0.13 - 30 ppm	Obvious and unpleasant odor.
50 - 150 ppm	Olfactory fatigue (temporary loss of smell) and marked dryness and irritation of the nose, throat and respiratory tract. Prolonged exposure may cause runny nose, cough, hoarseness, headache, nausea, shortness of breath, and severe lung damage (pulmonary edema).
200 - 250 ppm	Worsening and more rapid onset of the above health effects; possible death in 4 to 9 hours.
300 - 500 ppm	Excitement, severe headache and dizziness, staggering, loss of consciousness, respiratory failure likely in 5 minutes to an hour. Possible death in 30 minutes to 4 hours.
500+ ppm	Rapid onset of severe toxicity, respiratory paralysis, and death. If not fatal, may cause long-term effects such as memory loss, paralysis of facial muscles or nerve tissue damage.
800 - 1000 ppm	May be immediately fatal after one or more breaths, resulting in an instant unconsciousness or "knock-down" effect.

3.3.2 Personal Protective Equipment

Approved respiratory protection for H_2S at the Navajo Refinery shall consist of the following:

- 30-minute SCBA (self-contained breathing apparatus)
- Supplied air-line respirator with 5 minute egress cylinder

3.3.3 Respiratory Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentrations of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

3.4 Sulfur Dioxide (SO_2)

Sulfur dioxide is produced as a by-product of H_2S combustion. It is colorless, transparent and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide properties and characteristics are described in **Table 3**.

Table 6. Sulfur Dioxide Properties and Characteristics

CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

SO_2 exposure limits and effects of exposure are described in **Table 4.**

Table 7. Physical Effects of Sulfur Dioxide (SO_2)

Concentration	Effect
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life And Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly

3.5 RADII of Exposure (ROE)

RRS/Schirmer evaluated the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas for the worst case release scenario (as described in **Appendix A**) of H_2S gas for Navajo refinery. The 100-ppm and 500-ppm ROE were calculated in compliance with API RP-55 and are shown in **Table 8**. The details of calculations, equations and other variables used to evaluate the ROE are discussed in Appendix B-Calculation for Radius of Exposure. A map showing 100-ppm and 500-ppm contours are contained in **Appendix C**.

Table 8. Radius of Exposure

Concentration of H_2S (ppm)	Distance (feet)
100	1505
500	771

4.0 EMERGENCY ACTION PROCEDURES

4.1 Emergency Response Organization

Navajo Refining Company utilizes the Incident Command System (ICS) to manage emergency response activities. The ICS is a management tool which is readily adaptable to very small incidents as well as those of considerable significance. The ICS shall be implemented for all discharge/release incidents with staffing levels adjusted as required to meet the specific needs as determined by the size and severity of the incident. Response to a discharge originating from the Facility will be provided by the Emergency Response Team.

4.1.1 Qualified Individual

The Refinery Vice President/Manager serves as Qualified Individual (QI) and the Operations Manager serves as the Alternate Qualified Individual (AQI). Arrangements are made to ensure that either one or the other is available on a 24-hour basis and is able to arrive at the Facility in a reasonable time. The AQI shall replace the QI in the event of his absence and have the same responsibilities and authority.

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Refinery Vice President/Manager, or his designee, will be the On-Scene Incident Commander (IC). The IC will contact and coordinate response with Holly Corporation Management located in Dallas, Texas.

The Refinery Vice President/Manager or his designee shall determine:

1. Affected Unit shutdowns
2. Isolation of refinery process units
3. Repairs, tests or unit startup as required

4.1.2 Emergency Response Team

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by qualified management personnel.

The number of positions/personnel required to staff the Emergency Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the IC directly or delegated as the situation demands.

The IC is always responsible for directing the response activities and will assume the duties of all the primary positions until the duties can be delegated to other qualified personnel.

The Emergency Response Team is shown on the organization chart in **Figure 2**.

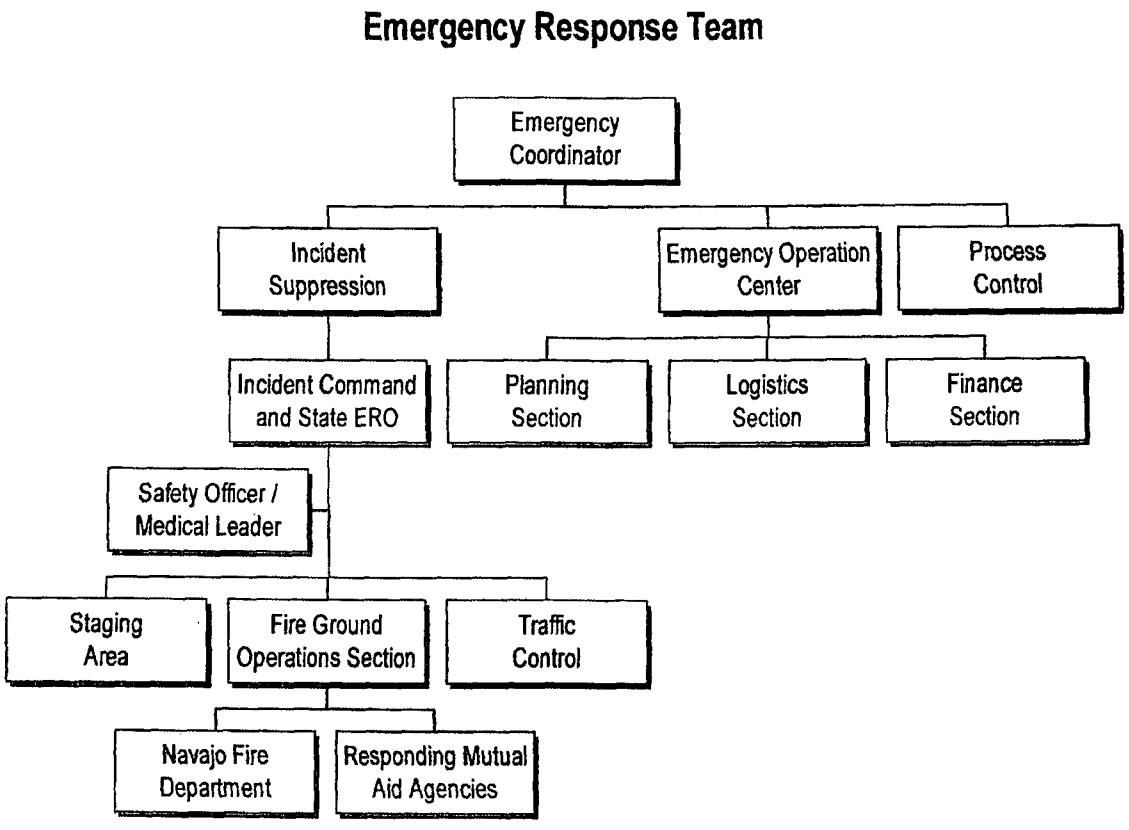


Figure 2. Emergency Response Team

4.2 Emergency Response

4.2.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

4.2.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

4.2.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's training program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Immediately notifying Central Dispatch (Refinery Laboratory) and the lab will:
  - Activate the Emergency Alarm System
  - Announce twice over the operating channel for that location "(type of emergency) at (location)" This alerts all operating, maintenance and office personnel of the emergency. Further instructions (shelter in place, evacuate, etc.) will be issued as needed based on the severity and extent of the H_2S concentrations.
  - Once the alarm is received, the alarm point will be contacted by Central Dispatch to verify the problem and gather any additional information about the situation. The person reporting the emergency should use this opportunity to tell Central Dispatch where the emergency is and the nature of the emergency (i.e., fire, spill, H_2S release)
  - After verifying the emergency exists, Central Dispatch will follow the appropriate procedure based on information received during the alarm verification.

4.2.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. The refinery has three (3) activation levels that are described below and in detail in the Response Flow Diagram in **Appendix F.**

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. **Without exception, personnel and public safety is first priority.**

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management.

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills or releases that are contained on refinery property as opposed to spills or releases that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

NAVAJO LEVEL 1 RESPONSE: For H_2S releases contained on refinery property:

1. In the event a fixed monitor alarms at the first set point of **20 ppm**:
   - Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
   - Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
   - Operations personnel may remove any personnel using proper respiratory protection at their discretion.
   - Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

NAVAJO LEVEL 2 RESPONSE: For H_2S releases contained on refinery property:

1. In the event a fixed monitor alarms at the second set point of **50 ppm:**
   - Operations personnel shall contact and remove all personnel in the affected area(s).
   - Non-operations personnel shall remove themselves from the affected unit area(s). IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL FROM THE AFFECTED AREA(S), IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).
   - Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.
   - Wear appropriate respiratory protection if available.
   - Make note of wind direction and evacuate upwind or cross wind from the affected area(s).
   - Check in with Operations once outside the affected area(s).

3. First Aid/Rescue Procedures:
   - Activate the alarm.

- Never attempt to rescue a downed victim without proper respiratory protection. Proper respiratory protection for rescue purposes is fresh air in the form of a 30-minute SCBA or supplied air-line respirator with an egress bottle.

- Remove victim to fresh air. Check victim for breathing and pulse. If qualified, administer CPR as needed until help arrives.

NAVAJO LEVEL 3 RESPONSE for H_2S releases that have the potential to migrate out from refinery property:

ACTIVATE THE H2S CONTINGENCY PLAN

1. For H_2S concentrations of 100 ppm or greater as measured at the refinery fence line:

- Operations personnel will activate the affected unit Emergency Shutdown

- Operations will activate the plant emergency alarm system by notifying Central Dispatch (Refinery Laboratory)

- Notify the City of Artesia Police Dispatcher by calling 911 immediately and informing them of an H_2S release emergency

- Notify the Eddy County LEPC at 575-361-3404 and inform them of an H_2S release emergency

- Notify the National Response Center (NRC) at 800-476-9635 and inform them of an H_2S release emergency

- Within four hours of the H2S release, notify the NMOCD's Artesia District Office at 575-748-1283 x-104 of the release

- Within four hours of the H2S release, notify the NMOCD's Santa Fe Office at 505-476-3490

The potential for a spill or vapor release to migrate out from refinery property is reduced since the Artesia refinery provides emergency shutdowns, Flares, mitigation (water deluge, foam systems to control vapors and emergency shutdown of the affected process units.), secondary containment protection through a process wastewater collection system from each process unit and loading area, and secondary containment dikes around the bulk storage tanks. However, in the unlikely event that discharges, including vapor releases, escape the confines of the facility, emergency procedures have been established.

2. When the City of Artesia has been notified of an H_2S release that may exceed 100 ppm in any defined public area (businesses, residences, schools, parks, etc.) and/or 500 ppm at any public road, the city will initiate the following actions as outlined in the City Of Artesia's **General Operating Order # OPR36, Unusual Occurrences:**

CITY OF ARTESIA RESPONSE To an H_2S release from the Navajo Refinery greater than 100 ppm:

OPR36.05 AUTHORITY FOR IMPLEMENTATION:

A. The authority for the implementation of the plans having to do with unusual occurrences lies with the Chief of Police or his designee.

OPR36.07 COMMAND POST:

A. During any unusual occurrence the Chief of Police or his designee directs the activities of the Department from a designated command post.

B. At least one competent employee should be assigned to the Chief of Police or other officer in charge in the Command Post to assist with administrative and communications functions.

C. Command Post entry will be restricted to authorized personnel only.

D. An appropriate number of personnel should be assigned to the unusual occurrence in order to accommodate the size and scope of it.

E. The federal Incident Command Structure system should be utilized as much as possible during unusual occurrences.

OPR36.09 EVACUATION OF CITIZENS:

A. Evacuation of persons should be a priority after the incident scene is secured.

B. Isolated and adjacent areas should be evacuated whenever conditions permit.

1. Removal of uninvolved persons not only insures their safety, but also greatly facilitates subsequent police action.

2. When possible, evacuees should be interviewed for any pertinent information about the scene or persons involved in the incident.

3. Mandatory evacuation of uninvolved persons is a legal difficulty. The attempt should be made and appropriate safety warnings issued, however, compliance is voluntary. In any case the warning given to persons choosing not to leave should be documented.

4. Injured civilian or police personnel should be evacuated from the area as soon as it is practical to do so. Refusals by injured civilians to be evacuated will be documented.

C. An alternative to removal may be a shelter or cover in place decision if removal would be more dangerous.

D. Communications:

1. During an emergency Channel One, which is the Department's primary radio channel, shall be designated for emergency traffic only until completion of the operation.

2. If required, the Emergency Command Post will be activated and communications established from the facility.

E. Situation Maps:

1. Maps should be maintained by the Department to be used during emergency situations to visually plot the emergency area.

2. City maps or building blueprints of schools or public buildings shall be obtained and made available at the command post.

F. Scene Commander:

1. The first supervisor on the scene immediately assumes command and is designated as Scene Commander until, or unless, relieved by a higher authority. It is the responsibility or the Scene Commander to:

a. Make a rapid survey of the scene and assess the seriousness of the situation.

b. Notify the staff through the Chain of Command of the current status of the situation to include the following:

i. Manpower needs;

ii. Route open to the scene;

iii. Location of a suitable staging area and parking area.

c. Establish a field command post and

i. Notify the Eddy County Central Communications Authority and the staff of the location of the unusual occurrence;

ii. Determine any communications available;

iii. Determine the specific equipment needed.

d. Supervise operations and maintain communications with the Eddy County Central Communications Authority.

G. Chain of Command:

1. During unusual occurrence, the established chain of command shall be strictly adhered to.

2. Other law enforcement agencies responding to aid the Department shall adhere to our established chain of command, unless otherwise directed by the Chief of Police.

H. Public information through media relations:

1. The purpose of effective public information dissemination is to maintain public confidence while keeping the public informed concerning any unusual occurrence.

2. The Department Public Information Officer is responsible to establish effective collection, control and dissemination of emergency public information, to minimize confusion, misinformation and for rumor control.

3. Area media agencies will be notified and a media information briefing point either in the vicinity of the occurrence or at the Department building in case of an area-wide occurrence. On a regular basis, information will be provided directly to media representatives by the designated media Relations Officer. All media agencies will be advised that no telephone inquiries will be responded to in order to reduce the burden on dispatchers and telephone lines.

J. Traffic Control:

1. Traffic control will be established as needed on the perimeter of the affected area to control access to the area, assist evacuation efforts and alleviate congestion.

2. The scope of certain disasters will dictate whether traffic control is an essential function and the priority at which it will be addressed. In circumstances where impact is limited in geographic area traffic control functions will be coordinated by police personnel, and may require support from and/or requests for mutual aid from other police agencies.

3. The Scene Commander is responsible to establish perimeters, sealing off the affected area, while routing traffic away from the location.

OPR36.18 MANMADE DISASTERS:

A. Employees should be prepared to establish relationships with other authorities and private businesses concerning manmade disasters and should be prepared to work with them to protect lives and property.

OPR36.19 SIGNALS CONCERNING MANMADE OR NATURAL DISASTERS:

A. Signals may be given by the city's early warning system. The system is also capable of delivering messages via public address. The system is controlled by Departments of the city and is available in situations that warrant its use. Additionally, a reverse 911 system is in place and may be used.

B. Signals may be given by the Navajo Emergency Alarm system. The following is a summary of these signals:

1. Whoop tone (sweeping low to high tone) signals an emergency condition in a Unit (I.e. fire, spill, **vapor release**, etc.).

2. Hi/lo tone (alternating high to low tone) signals a unit evacuation.

3. Alert tone (continuous siren tone) signals severe weather (tornado) alert.

4. All clear tone (single cycle of siren) signals the end of an emergency.

4.2.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate

- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

4.2.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums
- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

4.2.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid

gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 **the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO_2.**

Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined. Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

4.2.6 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at 20 ppm. A remote alarm is initiated in the control room along with local strobe lights and alarms located in the unit.

4.2.7 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and additional contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

4.2.8 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

4.2.8.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external

notification and reporting obligations associated with the activation of this H_2S Contingency Plan.

4.2.8.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or strobe light, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Safety Manager, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.
- Once the Safety Manager is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. refinery management will then conduct further reporting that is necessary based on the situation.

- Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

4.2.8.3 External Notification

The following guidelines should be remembered when reporting spills or vapor releases:

- Never include information that has not been verified
- Never speculate as to the cause of an incident or make any acknowledgement of liability
- Document:
  - Agency Notified
  - Date/Time of Notification
  - Person Notified
  - Content of Message Given
- DO NOT DELAY reporting due to incomplete information

Dialing 9-1-1 will connect to the Eddy County Central Communications Authority (ECCCA). This is Central Dispatch for all of Northern Eddy County (except for State Police) and serves the Eddy County Sheriff's Department, Artesia Police Department, Artesia Fire Department and Eddy County Fire Service.

Appendix G contains the Emergency Call List.

4.2.8.4 Site Security

The security measures in place for the Facility perimeter include fences and gates as follows:

- The refinery property is fully fenced and monitored by contract security guards 24 hours per day, 7 days per week.
- All plant entrances have automatic gates or are staffed with guards 24 hours per day.
- The Facility is manned by operating personnel 24 hours per day, 7 days per week.

4.2.8.5 Sign and Markers

The refinery has warning signs indicating the presence of H_2S at the entrances to the refinery. Signs are located at the plant entrances indicating that all visitors are to proceed to the main gate located at Freeman and Richey Streets to sign-in.

4.2.8.6 *First-Aid Station*

The first aid station will be located at the Emergency Assembly Area. First aid kits are located:

- All main office buildings
- Fire Station
- Warehouses
- Control Rooms

4.2.8.7 *Media Site*

If the H_2S Contingency Plan is activated, the Media Site will be located at the Artesia Chamber of Commerce Conference Room. An alternate media site will be established at the Artesia Fire Department Training Room if the Chamber of Conference is not a suitable location.

At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

4.2.8.8 *Emergency and Safety Equipment*

There are 4 emergency response trailers at the Artesia Refinery. Three trailers are located at Holly Energy Partners office east of the refinery and one trailer is maintained inside the refinery boundary fence. A complete listing of the emergency response equipment is provided in **Appendix E**.

5.0 TRAINING AND DRILLS

5.1 All Employees

All Navajo Refining employees and contractor employees shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas

- The person(s) are working in a plant area which contains no possible H_2S exposures

Training information and documentation will be maintained by the Safety Department.

5.2 Response Team Training

Navajo has designated a Safety Training Coordinator in light of the significant training and record keeping requirements by the many different government agencies (i.e., DOT, OSHA, EPA and various state and local agencies). The training coordinator's duties include conducting, training and maintaining records for all employees which documents the content of and the applicable regulatory requirement for the training. In addition to training records, the coordinator also maintains records of safety meetings and other meetings related to environmental regulations.

All employees who work in operating areas of the refinery or have the potential to be exposed to the operating areas receive an initial 40 hours of comprehensive training emphasizing occupational safety, environmental compliance and process safety management. Employees receive 40-hour training at their initial employment and annual computer based training (CBT) refresher training thereafter to comply with requirements found in:

- 40 CFR 112.7(e) - SPCC Plan
- 40 CFR 112.21 - Facility Response Plan
- 40 CFR 262 - Hazardous Waste Contingency Plan

Common elements of all three of these programs include prevention, detection, and response to releases of oils and other hazardous materials. Training common to all three also includes emphasis on good housekeeping practices (Best Management Practices), secondary containment, and prompt initial notification of an incident.

5.2.1 Response Team Exercises (Drills)

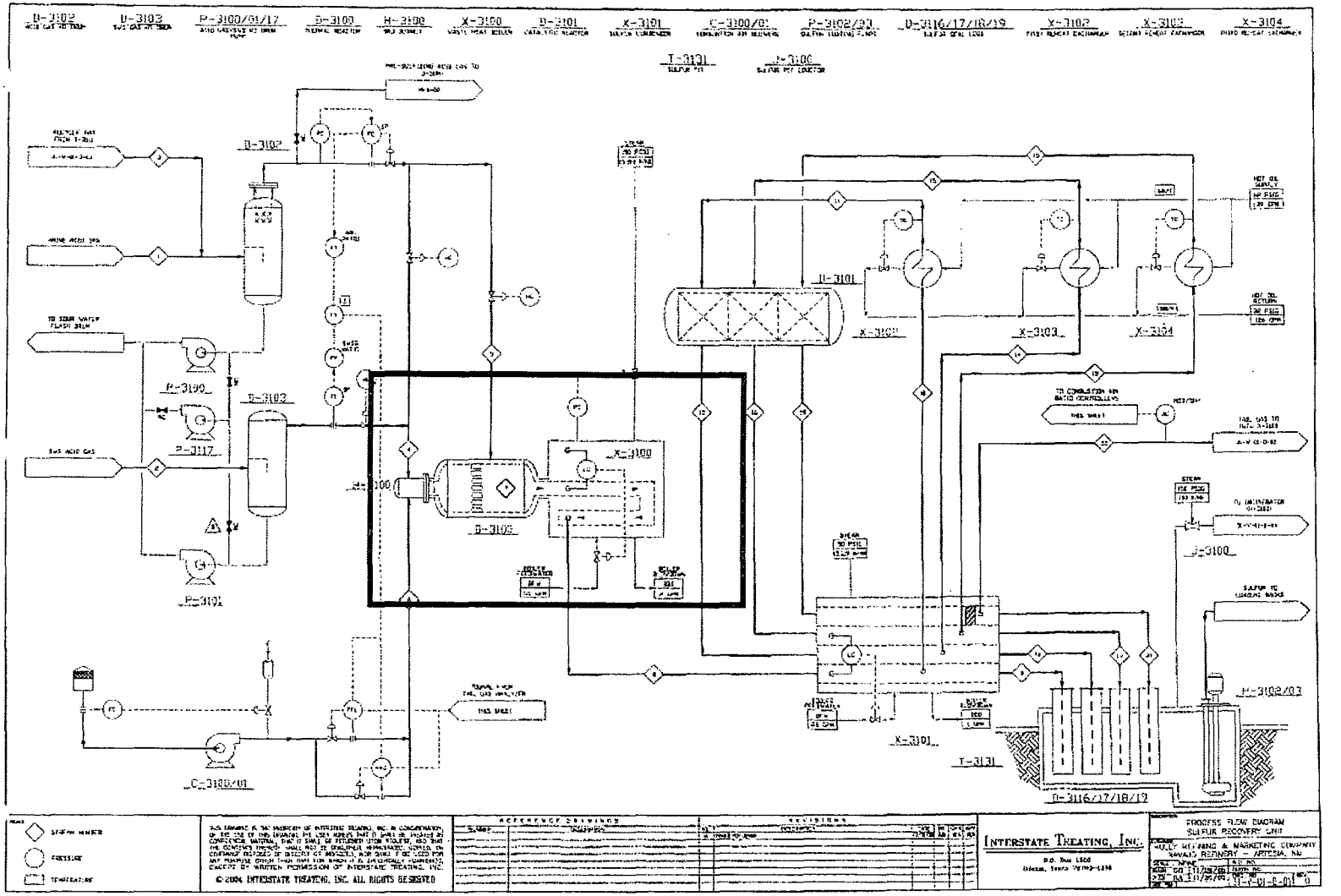
Emergency Response Team members, various agencies, contractors and other response resources will participate in emergency response exercises as required by federal, state, and local regulations and as detailed in the "National Preparedness for Response Exercise Program" (PREP). Navajo Refining Company will utilize announced and unannounced notification exercises, equipment deployment exercises, tabletop exercises, and/or various combinations to ensure that each component of the Plan is exercised as required. Exercises include:

- Annual Qualified Individual Notification Exercises
- Annual Equipment Deployment Exercise
- Annual Response Team Tabletop Exercise

APPENDIX A

WORST CASE SCENARIO FOR H_2S RELEASE

The worst case release scenario of H_2S gas was described by Navajo refining personnel to be the instantaneous release of contents of the thermal reactor located in the Sulfur Recovery Unit. The thermal reactor is shown in a red box in the PFD below.



APPENDIX B

CALCULATION FOR RADIUS OF EXPOSURE

To estimate the radius of exposure associated with an instantaneous release of H_2S due to the catastrophic rupture of a vessel, a calculation procedure from API RP-55, *Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide,* was adopted. The equation for predicting ROE for H_2S releases was taken from pg. 36 of Appendix C of API RP 55:

$$ROE = 10^{\left[A \times \log(H_2S) + B\right]} \quad \text{.....Equation 1}$$

Where ROE is H_2S radius of exposure, A and B coefficients contained in Table C-1 of API RP 55 (reprinted below), and $[H_2S]$ is the amount of H_2S released. For continuous release, the H_2S release rate in entered in standard cubic feet per hour (SCFH) and for a puff (instantaneous) release the quantity of H_2S is entered in standard cubic feet (SCF).

Table C-1—Linear Regression Coefficients for Mathematical Predictions of ROE as a Function of Downwind Hydrogen Sulfide Concentration and Release Quantity/Rate

Time*	Type of Release	Concentration, ppm	Coefficients A	Coefficients B
Day	Continuous	10	0.61	0.84
Day	Continuous	30	0.62	0.59
Day	Continuous	100	0.58	0.45
Day	Continuous	300	0.64	-0.08
Day	Continuous	500	0.64	-0.23
Night	Continuous	10	0.68	1.22
Night	Continuous	30	0.67	1.02
Night	Continuous	100	0.66	0.69
Night	Continuous	300	0.65	0.46
Night	Continuous	500	0.64	0.32
Day	Puff	10	0.39	2.23
Day	Puff	30	0.39	2.10
Day	Puff	100	0.39	1.91
Day	Puff	300	0.39	1.70
Day	Puff	500	0.40	1.61
Night	Puff	10	0.39	2.77
Night	Puff	30	0.39	2.60
Night	Puff	100	0.40	2.40
Night	Puff	300	0.40	2.20
Night	Puff	500	0.41	2.09

*Day Meteorological Conditions: Stability Class PG D (Neutral)—5 mph Wind Speed.
*Night Meteorological Conditions: Stability Class PG F (Stable)—2.2 mph Wind Speed.

The thermal reactor and the associated piping contain a total volume of 5,800 cubic feet. The composition of the stream exiting that vessel from the heat and material balance sheets is as shown below:

Component	Composition (lb moles/hr)	Composition Mole %
Nitrogen	766	56
Hydrogen	13	1
Carbon monoxide	3	0.2
Carbon dioxide	7	0.5
Water	364	26
Sulfur dioxide	40	3
Hydrogen sulfide	80	6
Carbon disulfide	0.15	<0.1
Carbonyl sulfide	0.44	<0.1
Sulfur dimer	106	8
Total	1,380	100

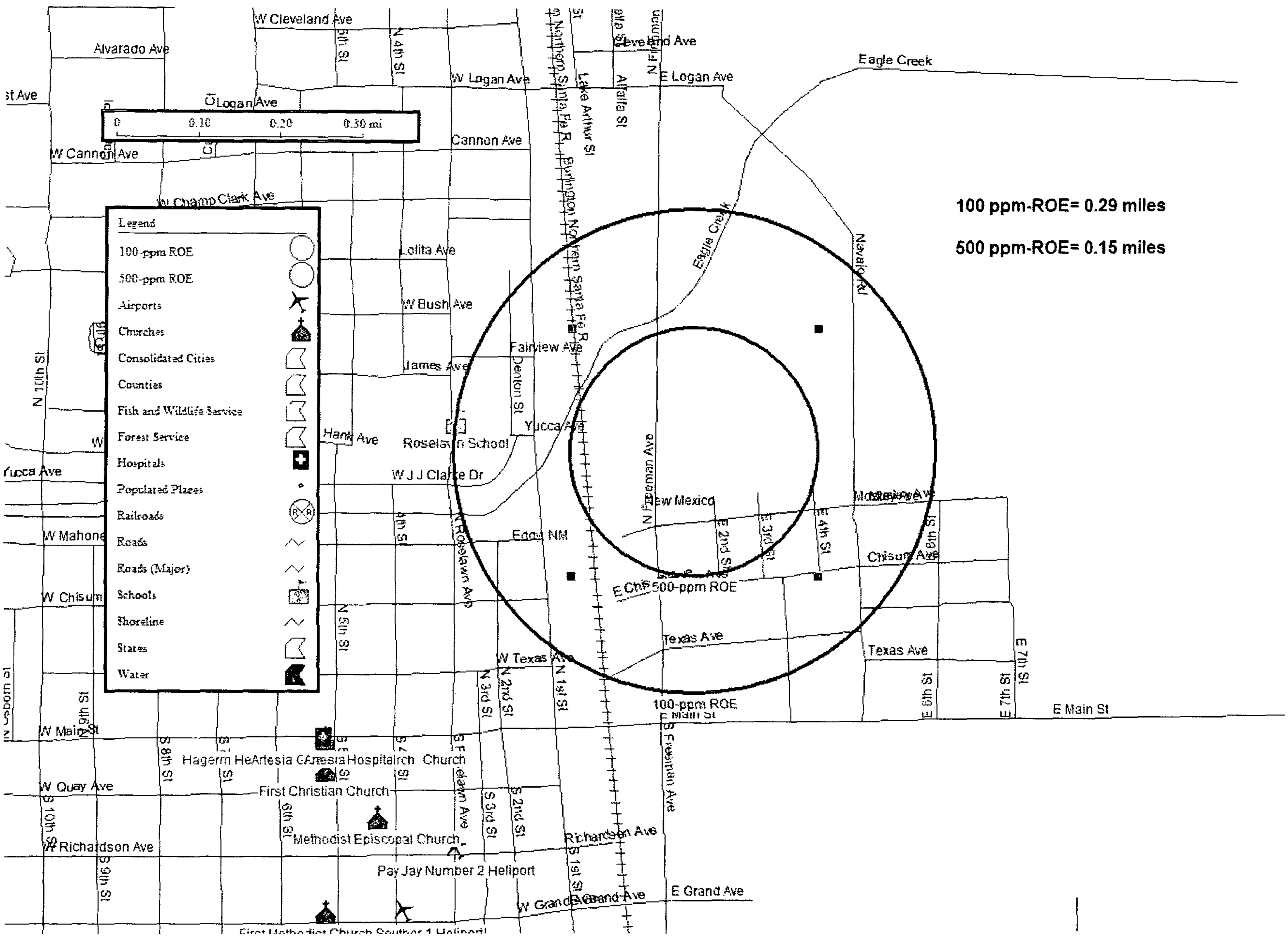
This stream was reported to be at a pressure of 20.6 psia and a temperature of 2416 degrees Fahrenheit. The composition of H_2S in the exiting stream is 6% by mole or volume fraction. Therefore, the maximum gaseous volume of H_2S in the vessel would be 6% of 5,800 cubic feet which is 348 cubic feet. At standard conditions of 14.73 psia and 60 degrees Fahrenheit, that volume would be equivalent to 88 SCF of H_2S. The coefficients A and B were taken from Table C-1 for night time conditions (to ensure the most conservative results), for puff releases (due to the instantaneous rupture scenario), and for 100 ppm and 500 ppm concentrations of interest. Radii of exposure for those two concentrations were calculated, as follows.

$$ROE - 100\,ppm = 10^{\left[0.40 \times \log(88) + 2.40\right]} = 1{,}505\,feet$$

$$ROE - 500\,ppm = 10^{\left[0.41 \times \log(88) + 2.09\right]} = 771\,feet$$

APPENDIX C

RADIUS OF EXPOSURE (ROE) MAP


100 ppm-ROE= 0.29 miles
500 ppm-ROE= 0.15 miles
Legend
100-ppm ROE
500-ppm ROE
Airports
Churches
Consolidated Cities
Counties
Fish and Wildlife Service
Forest Service
Hospitals
Populated Places
Railroads
Roads
Roads (Major)
Schools
Shoreline
States
Water
0
0.10
0.20
0.30 mi
Eagle Creek
Navajo Rd
W Cleveland Ave
Alvarado Ave
W Logan Ave
E Logan Ave
Cannon Ave
W Cannon Ave
Lolita Ave
W Bush Ave
James Ave
Fairview Ave
Denton St
Yucca Ave
Roselawn School
W J J Clarke Dr
Hank Ave
Eddy NM
New Mexico
N Freeman Ave
E 2nd St
E 3rd St
E 4th St
Chisum Ave
500-ppm ROE
Texas Ave
W Texas Ave
100-ppm ROE
E Main St
E 6th St
E 7th St
N 1st St
N 2nd St
N 3rd St
N 5th St
N 4th St
N 10th St
W Main St
W Quay Ave
W Richardson Ave
W Mahone
W Chisum
Yucca Ave
Hagerm HeArtesia GArtesia Hospitalrch Church
First Christian Church
Methodist Episcopal Church
Pay Jay Number 2 Heliport
Richardson Ave
S Freeman Ave
E Grand Ave
W Grand Ave
S 1st St
S 2nd St
S 3rd St
S 8th St
S 9th St
S 10th St
Burlington Northern Santa Fe R
Lake Arthur St
Alfalfa St
Cleveland Ave

APPENDIX D

PLANT DIAGRAM - EVACUATION ROUTES, H_2S MONITORING AND ALARM LOCATIONS

APPENDIX E

DESCRIPTION OF EMERGENCY RESPONSE EQUIPMENT

1. **Portable Pumps** — **Location**
   1. Blue Diesel Pump — Waste Water Treatment Plant
   2. New Portable Pump — North of Main Warehouse
   3. Red Gasoline Driven Pump — Tanks 437 & 439

2. **Booms**
   1. Spill Kit (see item no. 6) — Warehouse #4

3. **Absorbents**
   1. Spill Kit — Warehouse #4
   2. Sphag-Sorb Pillows — Warehouse #4
   3. Bail of Peat Moss — Warehouse #4

4. **Hand Tools**

5. **Fire Fighting & Personnel Protective Equipment** - Operational Status: Good

Type & Year	Quantity	Storage Location
1980 Ford Mini Pumper w/125 GPM Scat Fire Apparatus Pump 50 gal. Foam Tank	1	Fire Station
1986 National Foam Pumper w/1250 GPM pump 500 GPM Deck Gun, 1000 gal. Foam Tank	1	Fire Station
Foam Trailer 1650 Gal.	1	Fire Station
National Foam 660 GPM Foam Tower	2	Fire Station
Portable Monitors	13	Fire Station

6. ***Other*** (e.g., Heavy Equipment, Boats, & Motors) - Operational Status: Good

Type & Year	Quantity	Storage Location
Front End Loader (1985 John Deere) 300B	1	Crane Shed N. of Main Whse.)
Vacuum Truck (1985 Mack)	1 70 barrel (bbl)	Crane Shed (N. of Main Whse.)
Lugger Bucket Truck	1	Crane Shed (N. of Main Whse.)

7. **Communication Equipment** - Operational Status: Good

Description	Quantity	Location
Telephones	205+	Throughout Facility
Base Radios	6	Throughout Facility
Portable Radios	56	Throughout Facility
Mobile Radios	22	Throughout Facility
Remote Radios	12	Throughout Facility
Pagers	19	Throughout Facility
Cellular Phones	11	Throughout Facility

8. **Cellular phones**

Cellular Phones Assigned To	Phone No.
Safety & Risk Manager, Interim (King Kelley)	575 365-7508
Sr. Engineer Mgr (Jimmy Meeks)	575-308-8718
Sr. Maintenance Mgr (David Bolding)	575-365-2694
Sr. Operations Mgr (Ricky Swafford)	575-308-9865
Product Movement & Lab Mgr (David Latham)	575-746-5277
Refinery Mgr (Michael Whatley)	575-513-2276
Inspection Mgr (Jeff Beauregard)	575-365-4237
Sr. Environmental Mgr (Johnny Lackey)	972-261-8075

9. **Emergency Response Trailer**

5 packages of Hot Hog boom 3" X 10'
2 shovels
1 rake
1 push broom
1 pry bar
¾ cu ft of sphag sorb
1 box of nitrile gloves
6 pair rubber boots various sizes
Several pair of cloth gloves
Several pair of rubber gloves
5 folding chairs
1 large water gel blanket
1 generator
2 rescue blankets
Caution tape
1 roll of black plastic
Various hand tools
Air drill
Sash cord
1 decontamination sprayer
Scrub brushes
Gas can
8 pair of goggles
1 box of ear plugs
1 folding ladder
6 slicker suits
2 portable lights
2 extension cords
2 – 4 inch tie down straps
2 – Full body harnesses

APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM/H_2S DETECTION EQUIPMENT

APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 1 RESPONSE (Alarm Sounds in the control room and strobe lights activated at 20 PPM)

H_2S DETECTED GREATER THAN 20 PPM, ALARM SOUNDS IN THE CONTROL ROOM/STROBE LIGHTS ACTIVATED IN THE UNIT

- Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
- Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
- Operations personnel may remove any personnel using proper respiratory protection at their discretion.
- Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

AFFECTED UNIT AREAS

- Monitor H_2S levels in the affected units
- Wear appropriate respiratory protection if available.
- Make note of wind direction and evacuate upwind or cross wind from the affected area(s) to the designated assembly area(s).
- Check in with Operations once outside the affected area(s).

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

AFFECTED UNIT AREAS

Once resolved and monitored levels in the affected area are less than 10 ppm, return to the unit

NOTIFY LEPC, ARTESIA PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES IF NEEDED

APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 2 RESPONSE (Alarm Sounds in the control room, affected unit and strobe lights activated at 50 PPM)

H_2S DETECTED GREATER THAN 50 PPM, ALARM SOUNDS IN THE CONTROL ROOM/AFFECTED UNIT/STROBE LIGHTS ACTIVATED IN THE UNIT

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.

AFFECTED UNIT AREAS

- Monitor H_2S levels in the affected units
- Wear appropriate respiratory protection if available.
- Make note of wind direction and evacuate upwind or cross wind from the affected area(s) to the designated assembly area(s).
- Check in with Operations once outside the affected area(s).

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

Once resolved and monitored levels in the affected area are less than 10 ppm, return to the unit

NOTIFY NMOCD WITHIN FOUR HOURS, MAKE AGENCY REPORTS AS PER H_2S PLAN IF THE PLAN IS ACTIVATED

APPENDIX F

H_2S CONTINGENCY PLAN – FLOW DIAGRAM

LEVEL 3 RESPONSE (WORST CASE SCENARIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION)

H_2S DETECTED GREATER THAN 100 PPM &/OR UNIT AUDIBLE ALARM SOUNDS/STROBE LIGHTS ACTIVATED

- **Operators will activate the affected unit ESD and activate the emergency alarm system**
- **Follow the Immediate Action Plan steps found in section 4.2.3.1 of the Artesia H_2S Contingency Plan**

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ACTIVATE THE H_2S CONTINGENCY PLAN

NOTIFY LEPC, ARTESIA PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

↓

NOTIFY NMOCD WITHIN FOUR HOURS, MAKE AGENCY REPORTS AS PER H2S PLAN

↓

ONCE RESOLVED & MONITORED LEVELS IN THE AFFECTED UNIT ARE LESS THAN 10 PPM RETURN TO THE UNIT

H_2S Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentration of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

Detection - Personal Monitoring Equipment

Personal H_2S monitors used in the facility should alarm at the PEL (10 ppm) and STEL (15 ppm). Monitors may or may not have direct reading capabilities. Employees should wear a personal H_2S monitor at all times when working in the process units and Blender/Tank Farm locations. The monitors should be worn within the "breathing zone", unobstructed by clothing or equipment and such that the employee can readily perceive the alarms. The breathing zone is a 1.5-foot radius in all directions centered at the nose and mouth.

Alarm protocol

If a personal monitor alarms at the low alarm (PEL), personnel must leave the area and obtain fresh air equipment to complete the work task.

Detection - Fixed Monitoring Equipment

Fixed H_2S monitors are located in the refinery in the North Plant and the CCR. The fixed H_2S monitors have two alarm set points. The alarm set points and responses are as follows:

- First set point: 20 ppm
  - Response: Activates alarm in the control rooms
- Second set point: 50 ppm
  - Response: Activates alarm in the control room. Activates strobe lights and an audible alarm in affected unit area(s).

Alarm protocol:

In the event a fixed monitor alarms at the first set point of 20 ppm:

- Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
- Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
- Operations personnel may remove any personnel using proper respiratory protection at their discretion.
- Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

In the event a fixed monitor alarms at the second set point of 50 ppm:

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). **IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).**
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.

APPENDIX G

EMERGENCY CALL LIST

Navajo Refining Internal Notifications

Internal Notifications				
Organization	**Name**	**Office**	**Home**	**Other**
Emergency Coordinator Refinery VP/Manager (Qualified Individual):	Michael Whatley	(575) 748-3311 ext. 743	(575) 746-2096	(575) 513-2276
Alternate Qualified Individual Manager, Operations	Ricky Swafford	(575) 748-3311 ext. 244	(575) 746-0036	(575) 308-9865
Incident Commander Safety & Risk Manager:	King Kelley	(575) 748-3311 ext. 465	(575) 746-0036	(575) 365-7508
Fire Chief	King Kelley	(575) 748-3311 ext. 465	(575) 746-0036	Plectron Notification (575) 365-7508
Safety Officer/Medical Officer Safety Department	Kent Bratcher	(575) 748-3311 ext. 410	(575) 746-3268	Plectron Notification (575) 365-7995
Manager of Environmental for Water and Waste	Darrell Moore	(575) 748-3311 ext. 281	(575) 703-5058	(575) 703-5058
Logistics Section Maintenance Director	David Bolding	(575) 748-3311 ext. 444	(575) 365-2694	(575) 746-7646
Asst. Maintenance Supervisor	Trampas Spence	(575) 748-3311 ext. 395	(575) 365-2993	(575) 365-5071
Planning Section Maintenance Director	David Bolding	(575) 738-3311 ext. 444	(575) 365-2694	(575) 746-7646
Logistics Section Maintenance Department Coordinator	David Rowland	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section Purchasing Department	Mark Sanderson	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section – Expediter Purchasing Department	Jon Ross	(575) 748-3311 ext. 325	(575) 746-6452	(575) 365-4244

Navajo Refining External Notifications

Required External Notifications			
Agency	**Location**	**Office**	**Alternate**
National Response Center (NRC)	Washington, D.C.	(800) 424-8802	(202) 267-2675
Roswell State Police (SERC)	Roswell, NM	(575) 827-9223	(575) 622-7200
NM Energy, Minerals, and Natural Resources Department (OCD)	Artesia, NM (District 2)	(575) 748-1283	
Local Emergency Planning Committee (LEPC)	Carlsbad, NM	(575) 887-9511	(575) 887-7551
Assistance/Advisory Notifications (outside resources)			
Agency	**Location**	**Office**	**Alternate**
New Mexico Department of Game and Fish	Roswell, NM	(575) 624-6135	(575) 748-3036
New Mexico OSHA Bureau	Santa Fe, NM	(575) 827-2888	
OSHA (For Reportable Injury or Death)	Washington, D.C.	(800) 321-6724	
U.S. Environmental Protection Agency (EPA) Region IV	Dallas, TX	(800) 887-6063	(214) 665-2200
U.S. Fish and Wildlife Services (USFWS)	Albuquerque, NM	(505) 346-2525	
Bureau of Land Management (BLM)	Santa Fe, NM	(505) 438-7501	
New Mexico Health and Environmental Department	Santa Fe, NM	(505) 827-3723	
New Mexico Fire Marshal	Roswell, NM	(575) 347-5700	
National Weather Service (Recorded Forecasts) (NOAA)	Roswell, NM	(575) 347-5700	
Local Water Supply System	Artesia, NM	(575) 746-2122	(575) 746-2703
Local Emergency Services			
Agency	**Location**	**Office**	**Alternate**
Artesia Fire Department	Artesia, NM	911	(575) 746-5051
Eddy County Sheriff	Artesia, NM	911	(575) 746-9888
Artesia City Police	Artesia, NM	911	(575) 746-5000
Artesia Ambulance	Artesia, NM	911	(575) 746-5050
Artesia General Hospital	Artesia, NM	(575) 748-3333	(575) 736-8350 ER
Eastern New Mexico Medical Center	Roswell, NM	(575) 622-1110	
Guadalupe Medical Center	Carlsbad, NM	(575) 887-4100	

Other Emergency Resources

Oil Spill Removal Organizations (OSRO)			
Company	**Location**	**Office**	**Alternate**
TAS Environmental Services, Inc.	Fort Worth, TX	(888) 654-0111	(800) 442-7637
Additional Response Recourses			
Company	**Location**	**Office**	**Alternate**
Indian Fire & Safety	Artesia, NM	(575) 393-3093	(800) 530-8693
I/W Hot Oil - Transport Service	Artesia, NM	(575) 746-4214	
Gandy Corporation - Transports Service	Lovington, NM	(575) 396-4948	
Jim's Water Service - Transports Service	Artesia, NM	(575) 748-1352	(575) 748-1352
O.K. Hot Oil	Loco Hills, NM	(575) 746-6233	
Swett Construction - Dirt Equipment	Artesia, NM	(575) 748-1238	
T&C Tank Rental - Temporary Storage	Artesia, NM	(575) 746-9788	
International Bird Rescue Center	Fairfield, CA	(707) 207-0380	
Tri-State Bird Rescue	Newark, NJ	(302) 737-9543	
KBIM - TV	Roswell, NM	(575) 622-2120	
KSVP - AM Radio	Artesia, NM	(575) 746-2751	

APPENDIX H

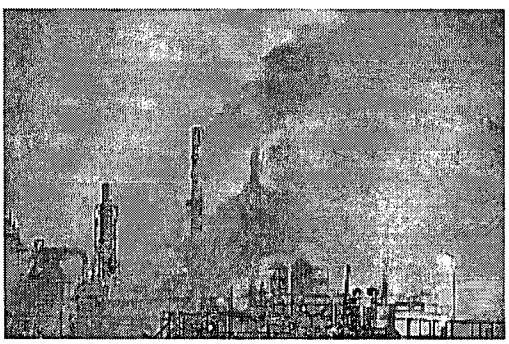
H_2S PLAN DISTRIBUTION LIST

DISTRIBUTION

COPY #	LOCATION
1	EOC
2	SAFETY LIBRARY
3	ENVIRONMENTAL FILE ROOM
4	ENVIRONMENTAL MANAGER
5	PLANT MANAGER
6	OPERATIONS MANAGER
7	MAINTENANCE OFFICE
8	PSM COORDINATOR
9	NORTH CONTROL ROOM
10	SOUTH CONTROL ROOM
11	CORPORATE EH&S
12	NMOCD SANTA FE
13	NMOCD ARTESIA
14	EDDY COUNTY LEPC
15	ARTESIA FIRE DEPT.
16	ARTESIA POLICE DEPT.

Artesia refinery fined $707,000 for safety lapses associated with deadly blast

By Bryant Furlow 9/17/10 11:48 AM DIGG TWEET



Navajo refinery. Photo by Glembly

The Navajo Refining Company has been fined $707,000 for after state investigators found the company knowingly failed to correct safety problems before a deadly March 2 storage tank explosion and fire at the company's plant in Artesia, N.M.

Two workers, Natividad Andajo and Victor Villa, were killed in the blast, their bodies were burned beyond recognition. Two other workers, both critically-injured, were airlifted to a hospital in Lubbock, Texas.

The plant processes crude oil into gasoline, diesel fuel and jet fuel.
The state Occupational Safety and Health Bureau has issued citations for one "serious" violation and 10 "willful" violations — the most serious category of infraction. Violations included the company's failure to train employees to recognize explosive hazards, failing to maintain fire prevention and fire protection programs, and allowing workers to conduct welding operations in the presence of flammable vapors.

"Serious" workplace safety violations are those representing hazards or conditions with a "substantial probability that death or serious physical harm could result," Bureau records show. "Willful" violations are even more serious, representing situations in which the employer knows a hazardous situation exists but makes a knowing, intentional decision not to correct it.

Bureau investigators had issued a total of 10 previous serious safety violation citations against the Navajo Refinery over the three years leading up to the March 2010 storage tank explosion, The Independent reported July 14. Those previous violations included a failure to maintain adequate fireproofing on support beams, missing guard rails, missing danger signs, missing electrical safety equipment and improperly maintained worker respirator equipment.

The Navajo Refinery explosion in March was just one of a string of refinery blasts and fires that have killed dozens of workers over recent years. New Mexico also has the nation's deadliest

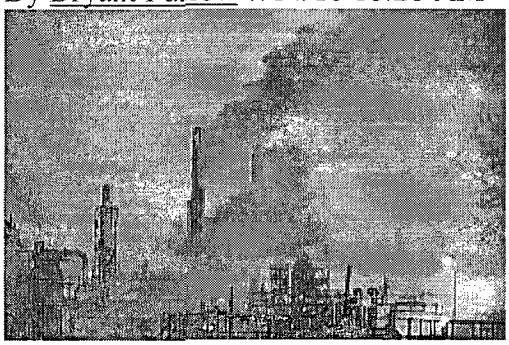
natural gas pipeline safety record. U.S. Senators Barbara Boxer and Dianne Feinstein have announced they will soon introduce national pipeline safety legislation, in the aftermath of the massive San Bruno, Calif., pipeline blast last week.

The Navajo refinery reported a hydrogen sulfide leak Sept. 8. In 2009, the Bureau cited the refinery after finding employees had been exposed to hydrogen sulfide fumes at concentrations exceeding the federal occupational safety regulation limit of 50 parts per million. One worker was exposed to 662 parts per million — more than 13 times higher than federal safety regulations permit — without adequate personal protection equipment, inspectors found. Even brief exposures involving inhalation of hydrogen sulfide at concentrations above 500 parts per million can kill and cause permanent brain damage, according to the U.S. Agency for Toxic Substances and Disease Registry (ATSDR).

The Holly Corporation-owned Navajo Refinery is composed of two separate plants: one in Artesia and another 65 miles to the east, in Lovington. The two plants are considered a single refinery because they transfer petroleum products by pipeline and both plants contribute to the same refinery process, Occupational Safety and Health Bureau chief Butch Tongate said.

Artesia refinery cited for safety violations before deadly explosion

By Bryant Furlow 7/14/10 10:28 AM



Navajo refinery. Photo by Glembly

Artesia Fire Chief J.D. Hummingbird heard the explosion at the Navajo Refinery just before 1 p.m. March 2. He stepped outside to see a large, black plume of smoke rising from the facility, which sits at the intersection of two busy highways less than a mile from the fire station. Firefighters arrived to find a storage tank, where contractors had been welding, engulfed in flames.

Two of the workers, Natividad Andajo and Victor Villa, were dead. Their bodies were burned beyond recognition.

Two other workers, both critically-injured, were airlifted to a hospital in Lubbock, Texas. One of them, Juan Carlos Hermosillo, 24, suffered broken arms, broken hips and fractured vertebrae. The refinery's Dallas, Texas-based parent company, Holly Corporation, immediately issued a press release confirming at least one fatality.

The New Mexico Occupational Health and Safety Bureau is investigating the explosion, Bureau chief Butch Tongate told The Independent earlier this week.

The exact cause of the explosion is not yet clear, but the investigation comes at a time of increasing concern about safety problems at refineries nationwide. Hermosillo, who filed a lawsuit from his hospital bed in March, claims in court records that safety inspections were not conducted before welding began the day of the explosion.
"The fire was tragic and the cause is still under investigation," refinery attorney Joel Carson told The Independent in an e-mail.

Four lawsuits have been filed against the refinery, Carson said: two by the dead workers' families and two by the injured workers. The company conducted internal safety reviews but cannot comment on those because of those pending lawsuits, Carson wrote.

Ten 'serious' safety violations in three years

Bureau inspection records obtained by The Independent show a series of serious safety lapses at the Navajo Refinery between 2007 and 2009. A total of three Bureau inspections — a comprehensive, four-day-long inspection in December 2007 and two single-day inspections in November 2008 and October 2009 — identified a total of 11 occupational safety violations at the Navajo Refinery, Bureau records show.

All but one of the violations were deemed "serious," meaning they represented a hazard or condition with a "substantial probability that death or serious physical harm could result," Bureau records show.

None of the violations involved storage tanks and the company remedied the identified problems within months of being cited, Bureau records confirm.

Nine of the 11 violations were identified during the comprehensive 2007 inspection. That inspection was part of a nationwide effort coordinated by the U.S. Occupational Safety and Health Administration (OSHA), Navajo Refining Company President David Lamp told The Independent in an e-mail.

"We always conduct our business with high regard for the health and safety of our employees, contractors, and neighboring communities," Lamp wrote. "The items identified in this investigation carried penalties of approximately $1,000 to $2,000 for each item, plus a requirement to take corrective action for each noted deficiency. Navajo paid total fines of approximately $15,000, corrected the majority of the items in the month the report was issued, with all items corrected within three months of the report."

The facility is actually composed of two separate plants: one in Artesia and another 65 miles to the east, in Lovington. The two plants are considered a single refinery because they transfer petroleum products by pipeline and both plants contribute to the same refinery process, Tongate said.

The 2007 inspection identified nine violations, eight of them serious, ranging from damaged fire-proof coating on facility support beams and missing guard rails, to missing danger signs, missing electrical safety equipment and improperly maintained respiration equipment.
Padlocks that ensure electrical equipment is turned off before repairs are attempted, were not properly installed, inspectors found in 2007. Two years later, during the November 2009 inspection, inspectors discovered lax lockout procedures, including the substitution of padlocks with plastic zip ties.

"That's a situation where there's a piece of machinery where they are required to de-energize ... in case somebody accidentally turns it on while somebody's inside," Tongate explained.
Other serious safety violations at both plants involved inadequate fireproofing. Fireproofing was cracked at damaged on a column in the Artesia plant, inspectors found in 2007.
Fireproofing was an even more serious issue at the Lovington plant.

"Fire proofing on several columns throughout the (Lovington) plant was damaged," a June 2, 2008 Bureau violation letter states.

The safety violations identified in the 2007 inspection were corrected in summer 2008, within months of the company's receipt of Bureau citation letters, Lamp wrote in an e-mail. "Safety is our number one priority and we take all safety matters seriously," Lamp wrote. But in 2009, state inspectors found that employees had been exposed to hydrogen sulfide fumes at concentrations exceeding the federal occupational safety regulation limit of 50 parts per million. One worker was exposed to 662 parts per million — more than 13 times higher than federal safety regulations permit — without adequate personal protection equipment, inspectors found.

Even brief exposures involving inhalation of hydrogen sulfide at concentrations above 500 parts per million can kill and cause permanent brain damage, according to the U.S. Agency for Toxic Substances and Disease Registry (ATSDR).

The Navajo Refinery, in New Mexico's southeastern plains, is the larger of state's two active petroleum refineries. It processes between 80,000 and 100,000 barrels per day of crude oil, producing gasoline, diesel, jet fuel and butane, according to the Holly website. company earnings reports and the U.S. Energy Information Administration.

Another explosion at the Artesia plant, caused by a butane gas leak, injured 17 workers nearly 30 years ago, in May 1981.

Holly Corporation owns two other refineries, in Tulsa, Oklahoma and Woods Cross, Utah.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, July 28, 2010 8:11 AM
To: 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Re: **Navajo, in cooperation with City of Lovington Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010**

Johnny:

Approved. Please submit a completed H2S Contingency Plan in hardcopy to the OCD by the above date.

If you would like to share your draft emergency response measures and any pertinent diagrams with Randy Dade and I before October 29, 2010, the OCD would be glad to review and comment.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 23, 2010 5:24 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Please see responses below. (Red Font).

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 14, 2010 11:02 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response and has also reviewed Navajo Refining Company's (NRC) H2S Contingency Plan (CP) applicable sections to determine the cause of NRC's concern(s) about public training. The OCD now understands what the problem is. NRC must revise and properly reference its "H2S Contingency Plan", "Emergency Response Section" and/or Initial Response Actions" sections of its CP to provide a detailed procedures and steps that it will take in the event of a release of H2S. This is what NRC must present to the general public along with applicable diagrams to educate the public on what NRC along with other applicable agencies will do in the event of an emergency.

OCD observations stemming from our recent communiqués on concerns about public training and review of NRC's H2S Contingency Plan are as follows:

1) Appendix D is missing the "Plant Diagram- evacuation routes, H2S Monitoring and Alarm Locations". This must be presented to the general public; and therefore, the H2S CP needs to be revised to include this diagram.
The diagram was included with the H2S CP submitted in an email to the OCD dated 3/31/10 file "Navajo H2S CP Plot Plan.pdf". The plot plan was submitted as a separate file due to illegibility if scanned with the plan. The plot plan clearly shows PLANT evacuation routes, location of all wind socks, fixed H2S monitor locations; the alarm settings for the fixed monitors are detailed in the Plan as well as actions to take if these alarm levels are triggered. Navajo has no plot plan of the city's escape routes, monitors, wind socks, or alarm settings. Navajo is working with the city to determine what is in place and needs to be included in Navajo's Plan. The city has a plan "ARTESIA POLICE DEPARTMENT GENERAL OPERATING ORDER# OPR36 UNUSUAL OCCURRENCES" which addresses some of the OCD's concerns regarding public notice, protection, evacuation, etc. and will be implemented as needed. This will be included in the training that is being developed for the public.

2) Page 12 Section 1.13.3.1 "Initial Response Actions" references Appendix F (H2S Contingency Plan Response), which references "Emergency Response Section." Neither section contain detailed response actions that must be taken by NRC responders in the event of an emergency situation with potential for migration of poisonous vapors offsite.
The actions required are outlined in Section 1.13.3 and Appendix F. Navajo met with Artesia City Emergency Responders on 7/15/10 to discuss their role regarding public protection. Further meetings will be scheduled with the City Council and Responders to develop an "off site" response plan, public notification, training etc. to be conducted as a joint effort between Navajo and the city of Artesia officials and responders.

3) Page 17, second bullet from the top references the "H2S Plan." The H2S Plan is not included with the report.
I'm looking at page 17 of the Plan and I don't see the reference???

4) Appendix F, Page F-3 "Emergency Procedures" indicates that emergency procedures for fire, facility evacuation, earthquake, etc. shall be followed as outlined in the Emergency Response Plan; however, neither section provides detailed emergency procedures listed for the worker or general public to understand exactly what measures will be taken by NRC.
Navajo is working with the City Emergency Responders to develop guidelines for the public to follow in the event of a worst case release of H2S from the Navajo Refinery. This has to be a joint effort with the approval of the Artesia City Council, which will include Public Notice and Training. The above referenced emergency procedures pertain to actions taken by plant employees to control the release with detailed actions found in the Refinery Emergency Plan. (A separate plan to protect refinery personnel and equipment). One step is to notify city officials if the emergency could impact the public at which time the city Emergency Responders' will take steps necessary to notify the public, control traffic, order shelter in place, evacuate if necessary. As stated before, Navajo is working diligently with city officials to develop plans to protect the public. This is ongoing and will take some time to develop.

In NRC's response e-mail below, Section 1.1.3.1 "Initial Response Actions" does not list detailed response actions. For example, who does what, what steps are taken A-Z in any plan with local and state agencies listed where appropriate

based on the response steps. NRC does not specify in detail what it will do in the event of an emergency. There is very little discussion on a vapor release scenario and what action steps would occur, i.e., NRC discusses facility vs. releases that may migrate off property.
This will be addressed in the revision.

OCD also reviewed the API-55 document, which contains sections, i.e., Section 7 Contingency Planning Including Emergency Procedures, **which NRC must follow**. The H2S CP was developed to help NRC with emergency action steps to protect workers and the general public.
API RP 55 is a guidance document only and clearly states in the "Forword" that "It is intended that these voluntary recommended practices serve as a guide to promote and maintain integrity of oil and/or gas producing and gas processing facilities in the interest of public safety, personnel safety and protection of the environment." "This publication, or portions thereof, cannot be substituted for qualified technical/operations analysis and judgment to fit a specific situation". This Recommended Practice was developed for oil and gas operations and gas processing facilities. Refining is not mentioned in the document. However, Navajo did use this Guide as a reference for developing the Plan. No where does it state that a facility "Must Follow" these guidelines. In fact the API's disclaimer in the "Special Notes" and "Foreword" make it clear that this document is for use as a guide and "makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability ....."

From this point on, and in accordance with the OCD's May 4, 2010 e-mail where it reserves the right to modify and change the H2S CP in cooperation with the NRC, and where the NRC H2S CP has a provision for amendments as needed to the CP, please provide a date for completion of the above revisions to the H2S CP in order for the NRC and OCD to move forward to address the public training requirement by close of business on Friday, July 23, 2010. The OCD believes that the above amendments will provide the NRC with the public training materials needed to address the public training aspect of the H2S Regulations.
Navajo, in cooperation with City of Lovington Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010, assuming we can schedule timely meetings with the City Council, present our proposals, and get consensus on the Plan revisions, notification options, training required, schedule for training, etc.

An annual mass mailing with information and diagrams to persons living within a certain distance from the refinery may be another option for the NRC if it is still concerned about a voluntary public notice process through a newspaper, public meeting, etc.
These options were discussed at the meeting on 7/15/10 and the appropriate method will be presented in the Plan revision.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 09, 2010 4:46 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

See response below.

Johnny Lackey

Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 07, 2010 8:07 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response to the OCD's July 2, 2010 e-mail communiqué associated with the above subject.

The OCD has become more concerned based on your responses, i.e., "The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds." It would appear based on your responses that Navajo Refining Company's (NRC) emergency measures are in need of revision?

How did you come to that conclusion? The rule states:

*"19.15.11.16 NOTIFICATION OF THE DIVISION: **The person 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 supersede notification.** The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release. [19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]" What's wrong with our response??*

From the H2S CP that was submitted and approved by the OCD:

1.1 Emergency Response

1.1.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

Chavez, Carl J, EMNRD

From: Lackey, Johnny [Johnny.Lackey@hollycorp.com]
Sent: Friday, July 23, 2010 5:24 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Please see responses below. (Red Font).

Johnny Lackey
Environmental Manager
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Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 14, 2010 11:02 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response and has also reviewed Navajo Refining Company's (NRC) H2S Contingency Plan (CP) applicable sections to determine the cause of NRC's concern(s) about public training. The OCD now understands what the problem is. NRC must revise and properly reference its "H2S Contingency Plan", "Emergency Response Section" and/or Initial Response Actions" sections of its CP to provide a detailed procedures and steps that it will take in the event of a release of H2S. This is what NRC must present to the general public along with applicable diagrams to educate the public on what NRC along with other applicable agencies will do in the event of an emergency.

OCD observations stemming from our recent communiqués on concerns about public training and review of NRC's H2S Contingency Plan are as follows:

1) Appendix D is missing the "Plant Diagram- evacuation routes, H2S Monitoring and Alarm Locations". This must be presented to the general public; and therefore, the H2S CP needs to be revised to include this diagram.

The diagram was included with the H2S CP submitted in an email to the OCD dated 3/31/10 file "Navajo H2S CP Plot Plan.pdf". The plot plan was submitted as a separate file due to illegibility if scanned with the plan. The plot plan clearly shows PLANT evacuation routes, location of all wind socks, fixed H2S monitor locations; the alarm settings for the fixed monitors are detailed in the Plan as well as actions to take if these alarm levels are triggered. Navajo has no plot plan of the city's escape routes, monitors, wind socks, or alarm settings. Navajo is working with the city to determine what is in place and needs to be included in Navajo's Plan. The city has a plan "ARTESIA POLICE DEPARTMENT GENERAL OPERATING ORDER# OPR36 UNUSUAL OCCURRENCES" which addresses some of the OCD's concerns regarding public notice, protection, evacuation, etc. and will be implemented as needed. This will be included in the training that is being developed for the public.

2) Page 12 Section 1.13.3.1 "Initial Response Actions" references Appendix F (H2S Contingency Plan Response), which references "Emergency Response Section." Neither section contain detailed response actions that must be taken by NRC responders in the event of an emergency situation with potential for migration of poisonous vapors offsite.
The actions required are outlined in Section 1.13.3 and Appendix F. Navajo met with Artesia City Emergency Responders on 7/15/10 to discuss their role regarding public protection. Further meetings will be scheduled with the City Council and Responders to develop an "off site" response plan, public notification, training etc. to be conducted as a joint effort between Navajo and the city of Artesia officials and responders.

3) Page 17, second bullet from the top references the "H2S Plan." The H2S Plan is not included with the report.
I'm looking at page 17 of the Plan and I don't see the reference???

4) Appendix F, Page F-3 "Emergency Procedures" indicates that emergency procedures for fire, facility evacuation, earthquake, etc. shall be followed as outlined in the Emergency Response Plan; however, neither section provides detailed emergency procedures listed for the worker or general public to understand exactly what measures will be taken by NRC.
Navajo is working with the City Emergency Responders to develop guidelines for the public to follow in the event of a worst case release of H2S from the Navajo Refinery. This has to be a joint effort with the approval of the Artesia City Council, which will include Public Notice and Training. The above referenced emergency procedures pertain to actions taken by plant employees to control the release with detailed actions found in the Refinery Emergency Plan. (A separate plan to protect refinery personnel and equipment). One step is to notify city officials if the emergency could impact the public at which time the city Emergency Responders' will take steps necessary to notify the public, control traffic, order shelter in place, evacuate if necessary. As stated before, Navajo is working diligently with city officials to develop plans to protect the public. This is ongoing and will take some time to develop.

In NRC's response e-mail below, Section 1.1.3.1 "Initial Response Actions" does not list detailed response actions. For example, who does what, what steps are taken A-Z in any plan with local and state agencies listed where appropriate based on the response steps. NRC does not specify in detail what it will do in the event of an emergency. There is very little discussion on a vapor release scenario and what action steps would occur, i.e., NRC discusses facility vs. releases that may migrate off property.
This will be addressed in the revision.

OCD also reviewed the API-55 document, which contains sections, i.e., Section 7 Contingency Planning Including Emergency Procedures, **which NRC must follow**. The H2S CP was developed to help NRC with emergency action steps to protect workers and the general public.
API RP 55 is a guidance document only and clearly states in the "Forword" that "It is intended that these voluntary recommended practices serve as a guide to promote and maintain integrity of oil and/or gas producing and gas processing facilities in the interest of public safety, personnel safety and protection of the environment." "This publication, or portions thereof, cannot be substituted for qualified technical/operations analysis and judgment to fit a specific situation". This Recommended Practice was developed for oil and gas operations and gas processing facilities. Refining is not mentioned in the document. However, Navajo did use this Guide as a reference for developing the Plan. No where does it state that a facility "Must Follow" these guidelines. In fact the API's disclaimer in the "Special Notes" and "Foreword" make it clear that this document is for use as a guide and "makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability ....."

From this point on, and in accordance with the OCD's May 4, 2010 e-mail where it reserves the right to modify and change the H2S CP in cooperation with the NRC, and where the NRC H2S CP has a provision for amendments as needed to the CP, please provide a date for completion of the above revisions to the H2S CP in order for the NRC and OCD to move forward to address the public training requirement by close of business on Friday, July 23, 2010. The OCD believes that the above amendments will provide the NRC with the public training materials needed to address the public training aspect of the H2S Regulations.
Navajo, in cooperation with City of Lovington Officials and Emergency Responders will work to develop an updated plan for submittal to the OCD on or before October 29, 2010, assuming we can schedule timely meetings with the City Council, present our proposals, and get consensus on the Plan revisions, notification options, training required, schedule for training, etc.

An annual mass mailing with information and diagrams to persons living within a certain distance from the refinery may be another option for the NRC if it is still concerned about a voluntary public notice process through a newspaper, public meeting, etc.
These options were discussed at the meeting on 7/15/10 and the appropriate method will be presented in the Plan revision.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
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Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
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See response below.

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1.1.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

1.1.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's training program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Immediately notifying Central Dispatch by:
  - Activating the Emergency Alarm System
  - Announce twice over the operating channel for that location "(type of emergency) at (location)" *(Local emergency responders monitor the Navajo Safety Radio Channel).*
  - Once the alarm is received, the alarm point will be contacted by Central Dispatch to verify the problem and gather any additional information about the situation. The person responsible for sounding the alarm should use this opportunity to tell Central Dispatch where the emergency is and the nature of the emergency (i.e., fire, spill, H_2S release)
  - After verifying the alarm, Central Dispatch will follow the appropriate procedure based on information received during the alarm verification

1.1.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. Response actions contained in Appendix F.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. **Without exception, personnel and public safety is first priority.**

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management. *(Keep in mind the plant is staffed 24 hours a day, 365 days per year and plant operations personnel will be the First Responders to any emergency release).*

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills or releases that are contained on refinery property as opposed to spills or releases that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

The potential for a spill or vapor release to migrate out from refinery property is reduced since the Artesia refinery provides emergency shutdowns, Flares, mitigation (water deluge, foam systems, etc.), secondary containment protection through a process wastewater collection system from each process unit and loading area, and secondary containment dikes around the bulk storage tanks. Based on the site topography, spills from the site flow northeast and the northeastern perimeter earthen bank is approximately eight feet high. These structures in conjunction with the diversion swale along the south face of Eagle Draw, flat slopes on-site, and a desert environment combine to effectively contain most spills on facility property. However, in the unlikely event that discharges escape the confines of the facility, emergency procedures have been established. Vapor releases are minimized by flaring, reducing charge rates, water deluge systems, foam application to control vapors and emergency shutdown of the affected process.

1.1.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate
- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

1.1.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums

- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

1.1.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO2.

Acid gas flaring will be initiated when the SRUs are unable to treat acid gas. The Amine Regeneration (Steam Reboiled Strippers) is equipped with a pressure control valve with a set-point higher than normal operating pressure of the stripper. With the acid gas blocked during a SRU trip, the pressure on the Stripper will increase until the pressure control valve set-point to flare is exceeded. The Stripper will then begin to send acid gas to the flare to maintain the pressure of the Stripper. Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined. Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

1.1.6 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at 20 ppm. A remote alarm is initiated in the control room along with local beacons and alarms located in the unit.

1.1.7 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

1.1.8 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

1.1.8.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external notification and reporting obligations associated

with the activation of this H_2S Contingency Plan. Internal notifications should be made for each emergency incident to the extent that the incident demands as described on the checklists provided as Table 4.

1.1.8.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If the Plant personnel detects H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Safety Manager, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.
- Once the Safety Manager is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. **Refinery management will then conduct further reporting that is necessary based on the situation.**
- Plant personnel are to advise any contractor, Service Company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

Why is this in need of revision so soon after approval??

The purpose of the H2S Contingency Plan (CP) is for NRC to develop a CP that would outline measures taken in the event of a major release of H2S that could adversely affect nearby public areas. All that is remaining for NRC to do is to train the public on its CP and who does what in the event of an emergency.

These are excerpts from our July 2, 2010 earlier response: "Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the

training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's."

"The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo."

"Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP."

Therefore, the OCD requires that NRC make a determination on whether it needs to update its emergency measures sections of its CP by COB on Friday, July 9, 2010. If not, NRC should provide an outline of how it proposes to train the general public on its completed CP. If revisions are needed, NRC needs to provide the OCD with a deadline for completion of the updates that will include a date and time for a public training or information meeting to discuss its completed CP emergency measures with the general public to satisfy the intent of the H2S Regulations.

Navajo's determination is that the Plan does not need updating at this time. On May 4, 2010 you wrote:

Johnny:

The plan that Navajo submitted meets the intent of the OCD regulations. OCD reserves the right to modify and change it in cooperation with Navajo.

Please contact me if you have questions or feel you have not satisfied the intent of the regulations. Thank you.

Carl J. Chavez, CHMM
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Oil Conservation Division, Environmental Bureau
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Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

As stated previously, Navajo is in the process of scheduling a meeting with Artesia City officials and responders to develop the necessary public awareness training regarding an H2S release from the refinery that may exceed the 100 ppm limit, thus triggering activation of the H2S Contingency Plan. (See attached email Meeting Notice).

Again:

"Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including

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*"****The training content and means to present the training will be developed*** *and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo."*

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Once Navajo and the Artesia city officials have met and developed a public meeting/training agenda, time and location, a copy will be submitted to the OCD. I can't speak for the city of Artesia on this issue. It has to be a mutual agreement between Navajo and the city of Artesia before we arbitrarily call a meeting of the citizens of Artesia and stumble through this important issue without forethought and preparation.

Please note that Navajo has no authority beyond our fence boundary to dictate to the city how they should conduct their emergency response actions. The Rule only states that:
"....and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans".

Navajo will work diligently with the local emergency response organizations to inform, provide support, and coordinate responsibilities and resources in the event activation of the Plan is necessary.

Since NRC has put together its CP with lists of emergency information and contacts, the above should make your meeting straight forward on what you need to train the public about. As you mentioned the refinery has more safety measures than ever, this should highlighted when you discuss the contents of your CP with the public. Thank you.

Carl J. Chavez, CHMM
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Sent: Tuesday, July 06, 2010 11:32 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
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Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Good afternoon. The OCD had perceived from the most recent meetings and communiqués on the above subject with Navajo Refining Company (NRC) that NRC and OCD had identified to use of the public notice as a process for soliciting or peaking the interest of the public or community for the public training requirements of the H2S Regulations for the facility.

Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's. It is anticipated that the ERO's will receive the highest volume of follow-up inquiries (concerns, notifications, fears, etc.). The public notice as it was being developed could have created undue public concerns. The wording suggested by OCD indicates the 'worst case scenario' is imminent. Nothing similar to the 'worst case H2S release scenario' has happened at Navajo in the 41 years since the company was established. In addition, the refinery has many more early warning and mitigation systems in place than ever before, so the likelihood of the 'worst case scenario' is much less likely than it has been in the past. Therefore, information and training must be prepared with a well thought approach by persons with appropriate expertise to prevent creation of unwarranted fears within the public sector. The intent is to inform, not cause alarm.

It is my understanding that NRC and OCD were both aware that the public notice process was not a regulatory requirement, but a path forward process for developing public training interest and to satisfy the H2S Regulations public training requirement. The OCD is on board with NRC in order to meet the public training requirement, but feels based on your message that you are now cutting off communications with the OCD and are attempting to move on your own path to satisfy the OCD H2S Regulations. OCD had indicated that due to the proximity of the public areas and ROEs calculated by NRC in its H2S Contingency Plan for the facility that a public meeting was imminent to make sure the public is informed, trained to know what to do and what will happen in the event of an H2S worse case release scenario that would threaten the safety of the community.

There is no intent to exclude the OCD from this process. As mentioned above, OCD was included in the meeting with city officials to discuss the plan. The Rule gives direction to the company for implementing requirements within the plan as necessary. The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds. Navajo fully intends to work with the city officials to provide training and notification to the public. The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo.

It appears based on your message below that NRC is uncomfortable with the public notice process and seems to indicate that OCD required it. This is not correct. Therefore, NRC is still obligated to satisfy the H2S Public Training Requirement in the OCD Regulations with the OCD. Based on your reply, "Navajo has no further comment and will work closely with Artesia Public officials to 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."

The "no further comment" statement was referencing OCD's comments to the Public Notice Draft that was submitted. As stated, after further review the public notice is not required and Navajo was under the impression from our previous meeting that this was a requirement from OCD and was proceeding accordingly. Yes, NRC is uncomfortable with a public notice via newspaper ad especially without inclusion of the local public officials who will be required to respond to perceived as well as actual emergencies.

The OCD hereby requires NRC to provide it with its new training agenda by a date agreed to by the OCD and NRC to satisfy the OCD H2S Regulations and specifically the "Public Training" provision. Please contact me by next Wednesday so we can communicate on NRC's new plans to educate the public and protect public safety based on the H2S Contingency Plan developed by the NRC.

Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP. Navajo is awaiting response from city officials. Nothing in the rule or API 55 guidance requires companies to furnish the Bureau with training agendas, content or a date to submit this information.

The OCD wishes to communicate and work with NRC to our mutual satisfaction as long as we can meet the intent of the OCD H2S Regulations. Thank you.

Mutual satisfaction must include the local public officials and ERO's.

File: OCD Online GW-028 "H2S Contingency Plan"

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 02, 2010 3:14 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

After further review and research, Navajo finds no directive in rule 19.15.11, Hydrogen Sulfide Gas or in API Recommended Practice 55 that requires the company to provide notice to the general public regarding H2S Contingency Plans. The Rule you cited in an earlier email (20.6.2.3108) is a requirement for application for a discharge permit, modification or renewal; therefore, Navajo has no further comment and will work closely with Artesia Public officials "to 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".

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075

Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, June 22, 2010 4:10 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Please find attached OCD's comments on Navajo Refinery's draft public notice. I think some of the items Randy Dade mentioned in his e-mail below should be incorporated into what happens when the contingency plan is activated. Remember that the public needs to be training on what would happen in a worse case scenario so they will know how to react and what to do in the event of a major H2S release to the community.

I had commented that we should just post a public meeting date, time and location to discuss the H2S Contingency Plan Emergency Procedures. Perhaps the meeting could be termed, "H2S Contingency Plan & Public Training Meeting" to satisfy the H2S Regulations.

Please contact me to discuss or resend another draft to Randy and I by COB next Friday, July 2, 2010.

Thank you for your cooperation in this matter.

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From: Dade, Randy, EMNRD
Sent: Tuesday, June 22, 2010 1:54 PM
To: Chavez, Carl J, EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

It was brought up at the meeting that at the public meeting, both the fire and police departments would be represented. It was also mentioned that all persons in the affected area that had telephone landlines would be notified by reverse 911. Navajo also mentioned setting up a phone system to take calls and leave comments during the initial public notice. I don't have any comments yet. I would like to read the final draft before it goes public. If there is anything else, give me a call, Randy.

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 22, 2010 1:07 PM
To: Dade, Randy, EMNRD

Cc: VonGonten, Glenn, EMNRD
Subject: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Randy:

Here are my comments. Do you have any? I want to send our draft back to Johnny and let them send us another one to look at....

I think we should also indicate in the end that a public meeting will be scheduled....? Should we schedule a date and time for the public meeting in the public notice to give the location, date and time of the meeting.....

Give me a call to discuss. Thanks.

Carl J. Chavez, CHMM
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Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, July 14, 2010 11:02 AM
To: 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; J D Hummingbird; draley@artesianm.gov; rburks@artesianm.gov; lsmith@artesianm.gov
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response and has also reviewed Navajo Refining Company's (NRC) H2S Contingency Plan (CP) applicable sections to determine the cause of NRC's concern(s) about public training. The OCD now understands what the problem is. NRC must revise and properly reference its "H2S Contingency Plan", "Emergency Response Section" and/or Initial Response Actions" sections of its CP to provide a detailed procedures and steps that it will take in the event of a release of H2S. This is what NRC must present to the general public along with applicable diagrams to educate the public on what NRC along with other applicable agencies will do in the event of an emergency.

OCD observations stemming from our recent communiqués on concerns about public training and review of NRC's H2S Contingency Plan are as follows:

1) Appendix D is missing the "Plant Diagram- evacuation routes, H2S Monitoring and Alarm Locations". This must be presented to the general public; and therefore, the H2S CP needs to be revised to include this diagram.

2) Page 12 Section 1.13.3.1 "Initial Response Actions" references Appendix F (H2S Contingency Plan Response), which references "Emergency Response Section." Neither section contain detailed response actions that must be taken by NRC responders in the event of an emergency situation with potential for migration of poisonous vapors offsite.

3) Page 17, second bullet from the top references the "H2S Plan." The H2S Plan is not included with the report.

4) Appendix F, Page F-3 "Emergency Procedures" indicates that emergency procedures for fire, facility evacuation, earthquake, etc. shall be followed as outlined in the Emergency Response Plan; however, neither section provides detailed emergency procedures listed for the worker or general public to understand exactly what measures will be taken by NRC.

In NRC's response e-mail below, Section 1.1.3.1 "Initial Response Actions" does not list detailed response actions. For example, who does what, what steps are taken A-Z in any plan with local and state agencies listed where appropriate based on the response steps. NRC does not specify in detail what it will do in the event of an emergency. There is very little discussion on a vapor release scenario and what action steps would occur, i.e., NRC discusses facility vs. releases that may migrate off property.

OCD also reviewed the API-55 document, which contains sections, i.e., Section 7 Contingency Planning Including Emergency Procedures, which NRC must follow. The H2S CP was developed to help NRC with emergency action steps to protect workers and the general public.

From this point on, and in accordance with the OCD's May 4, 2010 e-mail where it reserves the right to modify and change the H2S CP in cooperation with the NRC, and where the NRC H2S CP has a provision for amendments as needed to the CP, please provide a date for completion of the above revisions to the H2S CP in order for the NRC and OCD to move forward to address the public training requirement by close of business on Friday, July 23, 2010. The OCD believes that the above amendments will provide the NRC with the public training materials needed to address the public training aspect of the H2S Regulations.

An annual mass mailing with information and diagrams to persons living within a certain distance from the refinery may be another option for the NRC if it is still concerned about a voluntary public notice process through a newspaper, public meeting, etc.

Please contact me if you have questions. Thank you.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, July 07, 2010 8:07 AM
To: 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

The OCD has completed its review of your response to the OCD's July 2, 2010 e-mail communiqué associated with the above subject.

The OCD has become more concerned based on your responses, i.e., "The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds." It would appear based on your responses that Navajo Refining Company's (NRC) emergency measures are in need of revision?

The purpose of the H2S Contingency Plan (CP) is for NRC to develop a CP that would outline measures taken in the event of a major release of H2S that could adversely affect nearby public areas. All that is remaining for NRC to do is to train the public on its CP and who does what in the event of an emergency.

Therefore, the OCD requires that NRC make a determination on whether it needs to update its emergency measures sections of its CP by COB on Friday, July 9, 2010. If not, NRC should provide an outline of how it proposes to train the general public on its completed CP. If revisions are needed, NRC needs to provide the OCD with a deadline for completion of the updates that will include a date and time for a public training or information meeting to discuss its completed CP emergency measures with the general public to satisfy the intent of the H2S Regulations.

Since NRC has put together its CP with lists of emergency information and contacts, the above should make your meeting straight forward on what you need to train the public about. As you mentioned the refinery has more safety measures than ever, this should highlighted when you discuss the contents of your CP with the public. Thank you.

Carl J. Chavez, CHMM
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Sent: Tuesday, July 06, 2010 11:32 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD; Jelmini, David
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

See Navajo's response below.

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Fax - 575-746-5451
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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, July 02, 2010 3:41 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD
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Mutual satisfaction must include the local public officials and ERO's.

File: OCD Online GW-028 "H2S Contingency Plan"

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New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
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Sent: Friday, July 02, 2010 3:14 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

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Subject: FW: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

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Please contact me to discuss or resend another draft to Randy and I by COB next Friday, July 2, 2010.

Thank you for your cooperation in this matter.

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Sent: Tuesday, June 22, 2010 1:54 PM
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Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

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Sent: Tuesday, June 22, 2010 1:07 PM
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Cc: VonGonten, Glenn, EMNRD
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Johnny:

Good afternoon. The OCD had perceived from the most recent meetings and communiqués on the above subject with Navajo Refining Company (NRC) that NRC and OCD had identified to use of the public notice as a process for soliciting or peaking the interest of the public or community for the public training requirements of the H2S Regulations for the facility.

Navajo will coordinate notification and training requirements for the public with City officials and determine the most effective method for conducting the training, sharing information, number of meetings required, how to present the training, what the content of the training should be, etc. These details should be planned and organized in advance to most effectively present the information to the public. The Rule does not provide any guidance other than "The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate...and shall provide for briefing of public officials on issues such as evacuation or shelter in place plans". Company and city officials will determine how this should be addressed now that the plan has been submitted and approved. Navajo has had one meeting with city officials (including OCD Representatives) and is trying to set up another meeting to plan the next step in this process (public awareness and training). Navajo plans to accomplish this through public meetings, if city officials feel this is the most effective way to present this information, and will include the local ERO's. It is anticipated that the ERO's will receive the highest volume of follow-up inquiries (concerns, notifications, fears, etc.). The public notice as it was being developed could have created undue public concerns. The wording suggested by OCD indicates the 'worst case scenario' is imminent. Nothing similar to the 'worst case H2S release scenario' has happened at Navajo in the 41 years since the company was established. In addition, the refinery has many more early warning and mitigation systems in place than ever before, so the likelihood of the 'worst case scenario' is much less likely than it has been in the past. Therefore, information and training must be prepared with a well thought approach by persons with appropriate expertise to prevent creation of unwarranted fears within the public sector. The intent is to inform, not cause alarm.

It is my understanding that NRC and OCD were both aware that the public notice process was not a regulatory requirement, but a path forward process for developing public training interest and to satisfy the H2S Regulations public training requirement. The OCD is on board with NRC in order to meet the public training requirement, but feels based on your message that you are now cutting off communications with the OCD and are attempting to move on your own path to satisfy the OCD H2S Regulations. OCD had indicated that due to the proximity of the public areas and ROEs calculated by NRC in its H2S Contingency Plan for the facility that a public meeting was imminent to make sure the public is informed, trained to know what to do and what will happen in the event of an H2S worse case release scenario that would threaten the safety of the community.

There is no intent to exclude the OCD from this process. As mentioned above, OCD was included in the meeting with city officials to discuss the plan. The Rule gives direction to the company for implementing requirements within the plan as necessary. The OCD will be notified when the plan is activated due to a H2S release that could result in the public being exposed to H2S concentrations above the 500 or 100 ppm thresholds. Navajo fully intends to work with the city officials to provide training and notification to the public. The training content and means to present the training will be developed and approved by those that will assume the burden of satisfying the public need – i.e. the local public officials, ERO's and Navajo.

It appears based on your message below that NRC is uncomfortable with the public notice process and seems to indicate that OCD required it. This is not correct. Therefore, NRC is still obligated to satisfy the H2S Public Training Requirement in the OCD Regulations with the OCD. Based on your reply, "Navajo has no further comment and will work closely with Artesia Public officials to 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."

The "no further comment" statement was referencing OCD's comments to the Public Notice Draft that was submitted. As stated, after further review the public notice is not required and Navajo was under the impression from our previous meeting that this was a requirement from OCD and was proceeding accordingly. Yes, NRC is uncomfortable with a public notice via newspaper ad especially without inclusion of the local public officials who will be required to respond to perceived as well as actual emergencies.

The OCD hereby requires NRC to provide it with its new training agenda by a date agreed to by the OCD and NRC to satisfy the OCD H2S Regulations and specifically the "Public Training" provision. Please contact me by next Wednesday so we can communicate on NRC's new plans to educate the public and protect public safety based on the H2S Contingency Plan developed by the NRC.

Due to the large role and responsibility that will be required of the local public officials and ERO's, Navajo believes that they must be included in deciding the appropriate date based on the timing required to develop their response plan in the unlikely event of a 'worst case scenario'. Navajo plans to meet with city officials and ERO's to develop communication plans, training requirements and timing. As stated previously, we are trying to schedule this meeting ASAP. Navajo is awaiting response from city officials. Nothing in the rule or API 55 guidance requires companies to furnish the Bureau with training agendas, content or a date to submit this information.

The OCD wishes to communicate and work with NRC to our mutual satisfaction as long as we can meet the intent of the OCD H2S Regulations. Thank you.

Mutual satisfaction must include the local public officials and ERO's.

File: OCD Online GW-028 "H2S Contingency Plan"

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 02, 2010 3:14 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

After further review and research, Navajo finds no directive in rule 19.15.11, Hydrogen Sulfide Gas or in API Recommended Practice 55 that requires the company to provide notice to the general public regarding H2S Contingency Plans. The Rule you cited in an earlier email (20.6.2.3108) is a requirement for application for a discharge permit, modification or renewal; therefore, Navajo has no further comment and will work closely with Artesia Public officials "to 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".

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, June 22, 2010 4:10 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Please find attached OCD's comments on Navajo Refinery's draft public notice. I think some of the items Randy Dade mentioned in his e-mail below should be incorporated into what happens when the contingency plan is activated. Remember that the public needs to be training on what would happen in a worse case scenario so they will know how to react and what to do in the event of a major H2S release to the community.

I had commented that we should just post a public meeting date, time and location to discuss the H2S Contingency Plan Emergency Procedures. Perhaps the meeting could be termed, "H2S Contingency Plan & Public Training Meeting" to satisfy the H2S Regulations.

Please contact me to discuss or resend another draft to Randy and I by COB next Friday, July 2, 2010.

Thank you for your cooperation in this matter.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490

Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Dade, Randy, EMNRD
Sent: Tuesday, June 22, 2010 1:54 PM
To: Chavez, Carl J, EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

It was brought up at the meeting that at the public meeting, both the fire and police departments would be represented. It was also mentioned that all persons in the affected area that had telephone landlines would be notified by reverse 911. Navajo also mentioned setting up a phone system to take calls and leave comments during the initial public notice. I don't have any comments yet. I would like to read the final draft before it goes public. If there is anything else, give me a call, Randy.

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 22, 2010 1:07 PM
To: Dade, Randy, EMNRD
Cc: VonGonten, Glenn, EMNRD
Subject: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Randy:

Here are my comments. Do you have any? I want to send our draft back to Johnny and let them send us another one to look at....

I think we should also indicate in the end that a public meeting will be scheduled....? Should we schedule a date and time for the public meeting in the public notice to give the location, date and time of the meeting.....

Give me a call to discuss. Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
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Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, July 02, 2010 3:41 PM
To: 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell; Sanchez, Daniel J., EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Good afternoon. The OCD had perceived from the most recent meetings and communiqués on the above subject with Navajo Refining Company (NRC) that NRC and OCD had identified to use of the public notice as a process for soliciting or peaking the interest of the public or community for the public training requirements of the H2S Regulations for the facility.

It is my understanding that NRC and OCD were both aware that the public notice process was not a regulatory requirement, but a path forward process for developing public training interest and to satisfy the H2S Regulations public training requirement. The OCD is on board with NRC in order to meet the public training requirement, but feels based on your message that you are now cutting off communications with the OCD and are attempting to move on your own path to satisfy the OCD H2S Regulations. OCD had indicated that due to the proximity of the public areas and ROEs calculated by NRC in its H2S Contingency Plan for the facility that a public meeting was imminent to make sure the public is informed, trained to know what to do and what will happen in the event of an H2S worse case release scenario that would threaten the safety of the community.

It appears based on your message below that NRC is uncomfortable with the public notice process and seems to indicate that OCD required it. This is not correct. Therefore, NRC is still obligated to satisfy the H2S Public Training Requirement in the OCD Regulations with the OCD. Based on your reply, "Navajo has no further comment and will work closely with Artesia Public officials to 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."

The OCD hereby requires NRC to provide it with its new training agenda by a date agreed to by the OCD and NRC to satisfy the OCD H2S Regulations and specifically the "Public Training" provision. Please contact me by next Wednesday so we can communicate on NRC's new plans to educate the public and protect public safety based on the H2S Contingency Plan developed by the NRC.

The OCD wishes to communicate and work with NRC to our mutual satisfaction as long as we can meet the intent of the OCD H2S Regulations. Thank you.

File: OCD Online GW-028 "H2S Contingency Plan"

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
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1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
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Website: http://www.emnrd.state.nm.us/ocd/index.htm
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From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Friday, July 02, 2010 3:14 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Carl:

After further review and research, Navajo finds no directive in rule 19.15.11, Hydrogen Sulfide Gas or in API Recommended Practice 55 that requires the company to provide notice to the general public regarding H2S Contingency Plans. The Rule you cited in an earlier email (20.6.2.3108) is a requirement for application for a discharge permit, modification or renewal; therefore, Navajo has no further comment and will work closely with Artesia Public officials "to 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".

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, June 22, 2010 4:10 PM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Johnny:

Please find attached OCD's comments on Navajo Refinery's draft public notice. I think some of the items Randy Dade mentioned in his e-mail below should be incorporated into what happens when the contingency plan is activated. Remember that the public needs to be training on what would happen in a worse case scenario so they will know how to react and what to do in the event of a major H2S release to the community.

I had commented that we should just post a public meeting date, time and location to discuss the H2S Contingency Plan Emergency Procedures. Perhaps the meeting could be termed, "H2S Contingency Plan & Public Training Meeting" to satisfy the H2S Regulations.

Please contact me to discuss or resend another draft to Randy and I by COB next Friday, July 2, 2010.

Thank you for your cooperation in this matter.

Carl J. Chavez, CHMM
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1220 South St. Francis Dr., Santa Fe, New Mexico 87505
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Website: http://www.emnrd.state.nm.us/ocd/index.htm
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From: Dade, Randy, EMNRD
Sent: Tuesday, June 22, 2010 1:54 PM
To: Chavez, Carl J, EMNRD
Subject: RE: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

It was brought up at the meeting that at the public meeting, both the fire and police departments would be represented. It was also mentioned that all persons in the affected area that had telephone landlines would be notified by reverse 911. Navajo also mentioned setting up a phone system to take calls and leave comments during the initial public notice. I don't have any comments yet. I would like to read the final draft before it goes public. If there is anything else, give me a call, Randy.

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 22, 2010 1:07 PM
To: Dade, Randy, EMNRD
Cc: VonGonten, Glenn, EMNRD
Subject: Artesia Refinery Public Training Notice H2S Contingency Plan OCD Draft Review

Randy:

Here are my comments. Do you have any? I want to send our draft back to Johnny and let them send us another one to look at....

I think we should also indicate in the end that a public meeting will be scheduled....? Should we schedule a date and time for the public meeting in the public notice to give the location, date and time of the meeting.....

Give me a call to discuss. Thanks.

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attachments. Unless expressly stated, nothing contained in this message should be construed as a digital or electronic signature or a commitment to a binding agreement.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, June 02, 2010 6:51 AM
To: 'Lackey, Johnny'; Dade, Randy, EMNRD
Cc: Whatley, Michael; mleighton@lovington.org
Subject: RE: H2S Contingency Plan Meeting

Johnny:

Just want to make sure you are also planning to public notice the Lovington Refinery to satisfy the public training requirement. There likely need to be a public meeting at the Artesia Refinery to go over evacuation of the neighborhood, etc. Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Tuesday, June 01, 2010 4:29 PM
To: Dade, Randy, EMNRD
Cc: Chavez, Carl J, EMNRD; Whatley, Michael
Subject: FW: Meeting

Hi Randy. I left a voice message for you regarding this meeting. I think I said the meeting was tomorrow, but actually it's Thursday, 10 AM at the Artesia Fire Station. Hope you can make it.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Kelley, King
Sent: Tuesday, June 01, 2010 2:46 PM
To: J D Hummingbird; 'Rick Burks'
Cc: 'Lindell Smith'; Lackey, Johnny
Subject: RE: Meeting

We will meet all of you at the Fire Station at 10:00am on Thursday, June 6th, 2010. We would like to discuss the NRC H2S Contingency Plan and the OCD requirements that go along with it. Mr. Lackey and I are looking forward to meeting with you.

From: J D Hummingbird [mailto:jdhummingbird@artesianm.gov]
Sent: Tuesday, June 01, 2010 1:49 PM
To: 'Rick Burks'; Kelley, King
Cc: 'Lindell Smith'
Subject: RE: Meeting

King,

Can we meet over here on Thursday?

Sgt. Smith,

Do you have a POC for the State Police that may be able to attend?

From: Lindell Smith [mailto:lsmith@artesianm.gov]
Sent: Tuesday, June 01, 2010 1:31 PM
To: 'J D Hummingbird'
Subject: RE: Meeting

Its on my calendar and the room is blocked off from 10-12. 611 W Mahone Suite A

Lindell Smith
Artesia PD
575-746-7134

From: J D Hummingbird [mailto:jdhummingbird@artesianm.gov]
Sent: Tuesday, June 01, 2010 1:20 PM
To: 'Lindell Smith'
Subject: RE: Meeting

We can go over there or they will come here...your preference? At your training room?

From: Lindell Smith [mailto:lsmith@artesianm.gov]
Sent: Tuesday, June 01, 2010 1:19 PM
To: 'J D Hummingbird'
Subject: RE: Meeting

Do you know where the meeting is?

Lindell Smith
Artesia PD
575-746-7134

From: J D Hummingbird [mailto:jdhummingbird@artesianm.gov]
Sent: Tuesday, June 01, 2010 1:16 PM
To: Lindell Smith

Cc: Don Raley; 'Rick Burks'
Subject: Meeting

Sgt. Smith,

Are you available for a quick meeting with Navajo on Thursday at 1000 hrs? It concerns notification of public for large H2S release.

Chief,

They are going to request to meet with all of us (AFD, APD and State Police eventually). If you can make it even better...They have a response deadline of 18 Jun 10. Was hoping to get a head start on their plan (it's been completed from my understanding, but wanted to look at and discuss it with them).

Thanks.

Artesia Fire Department

J.D. Hummingbird
Fire Chief

firechief@artesianm.gov
309 N. 7th St.
Artesia, NM 88210

Work: 575.746.5051
Cell: 575.513.1888
Fax: 575.746.5065

****
IMPORTANT/CONFIDENTIAL: This message from the City of Artesia is intended only for the use of the add ressees shown above.
It contains information that may be privileged, confidential and/or exempt from disclosure under applicable law.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 20, 2010 9:02 AM
To: 'Lackey, Johnny'
Cc: 'Schmaltz, Randy'; 'Riege, Ed'; VonGonten, Glenn, EMNRD
Subject: H2S CP & Public Notice

Johnny, et al.:

FYI, you are probably already aware of the Emergency Response Guidebook usually provided during Hazwoper Training Courses. This gives detailed guidance on evacuation radius, etc.

Also, OCD wants the LEPC and Fire Departments to be fully engaged during facility emergencies. The communities are relying on their local Fire Marshals and Fire Departments to step up to plate when they need to stand and deliver during emergencies. We do not want to see the LEPC excluded or turned away from refinery gates during emergencies at refineries in New Mexico. They must become an integral part of the response, solution, provide command and control infrastructure during an emergency, and catastrophies, etc. Please be sure to include them in the emergency process at the refineries in New Mexico.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 04, 2010 3:32 PM
To: 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: H2S Contingency Plan (Plan) (GW-028)

Johnny:

Navajo Refining Company (NRC) should look over its recent submittal to address the needed information for the public education/training requirement of the regulations.

I look forward to receiving your draft public notice by June 18, 2010 for final approval or approval with additional requirements from the OCD-EB before the public notice is placed in the local newspaper. A good primer for the public notice process is 20.6.2.3108 NMAC (English and Spanish) which may include posting outside of the classified ad section of the newspaper and at key locations for the general public (i.e., library), etc. NRC should state a time limit to receive inquiries of about 30 days so we can bring closure to the process.

There should be a mail address, e-mail address and telephone number to an NRC Rep. who can answer technical questions and voice concerns of citizens and this log needs to be provided to the local Fire Marshal (or LEPC), State Police, OCD-EB and OCD Artesia District Office for determination of a meeting. The information should identify the exact action steps NRC working in concert with the local Fire Marshal, State Police, OCD would undertake to protect public safety from a release of H2S and SO2.

Thank you.

Carl J. Chavez, CHMM
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Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Tuesday, May 04, 2010 1:20 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD; Whatley, Michael; Moore, Darrell
Subject: RE: H2S Contingency Plan (Plan) (GW-028)

Carl:

In response to your request for a proposed date to submit a draft of the Public Notice to the OCD, Navajo will submit a draft for OCD review on or before June 18, 2010. Navajo will schedule a meeting with the local emergency response groups (Fire Dept., Police Dept.) and District OCD representatives to get their thoughts and comments to be included in the draft as well as approval of the release from our legal department prior to submittal to the Artesia newspaper. Navajo will include the OCD recommendations listed below in the notification.

Thanks,

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.

Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, April 30, 2010 8:02 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD
Subject: FW: H2S Contingency Plan (Plan) (GW-028)

Johnny:

Re: As we discussed, once the plan is approved, Navajo Refining Company (Navajo) will prepare a "Public Notice" for the local newspaper to publish which will serve as notice to those that may be affected by a release from the refinery. I will send a copy of the proposed release to you for review and approval before sending to the newspaper for publishing.

Good morning. The H2S Contingency Plan has been scanned into OCD Online at "GW-028" under the "H2S Contingency Plan" thumbnail.

The most immediate concern to OCD based on the Plan is the ROEs (100 & 500 ppm) overlapping the nearby community and public health concerns. Fortunately, Navajo has maintained good communication throughout the Plan preparation and we discussed a plan for educating the public on what Navajo will do in the event of an H2S release that threatens public safety. Navajo is also working on Lovington Refinery Plan, which OCD expects to receive soon.

OCD's recommendation and in consideration of any recommendation(s) by OCD District Office Supervisor, Randy Dade, is: Navajo shall submit a draft of its public notice for the local newspaper(s) for OCD review and comment. We want the map to be shown, an explanation of what H2S and SO2 are and why they are dangerous, and the emergency action steps that Navajo will undertake to protect the community with a mail address and phone number for all incoming calls on the matter and letters to be logged and shared with the OCD. The OCD's position is that if there is significant interest voiced and/or documented by letter to Navajo, OCD feels it is in the best interest to hold a "Safety Meeting" open to the community where any questions, issues, etc. may be discussed with the community with the local Fire Marshal in attendance along with the OCD.

Please let me know your thoughts by next Friday COB with proposed date to submit your draft to Randy and I so we can proceed to address the H2S Public Safety issues together for the Artesia Refinery. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Wednesday, March 31, 2010 4:48 PM
To: 'Lackey, Johnny'

Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan

Johnny:

Please send it as the final contingency plan for OCD review. The OCD does want to review draft documents. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
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Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
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From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Wednesday, March 31, 2010 4:42 PM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan
Importance: High

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Let me know if you need additional information or have any questions regarding this submittal.

Johnny Lackey
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Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, March 12, 2010 4:35 PM

To: Lackey, Johnny
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan

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To: Lackey, Johnny
Subject: H2S Contingency Plan

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Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 04, 2010 8:21 AM
To: 'Lackey, Johnny'
Subject: RE: H2S Contingency Plan (Plan) (GW-028)

Johnny:

The plan that Navajo submitted meets the intent of the OCD regulations. OCD reserves the right to modify and change it in cooperation with Navajo.

Please contact me if you have questions or feel you have not satisfied the intent of the regulations. Thank you.

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E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Monday, May 03, 2010 4:01 PM
To: Chavez, Carl J, EMNRD
Subject: RE: H2S Contingency Plan (Plan) (GW-028)

Not to be presumptuous but, by scanning the Artesia Plan into the OCD's online system I assume that means the Plan has been approved?

Johnny Lackey
Environmental Manager
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Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, April 30, 2010 8:02 AM
To: Lackey, Johnny
Cc: Dade, Randy, EMNRD; VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD
Subject: FW: H2S Contingency Plan (Plan) (GW-028)

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Re: As we discussed, once the plan is approved, Navajo Refining Company (Navajo) will prepare a "Public Notice" for the local newspaper to publish which will serve as notice to those that may be affected by a release from the refinery. I will send a copy of the proposed release to you for review and approval before sending to the newspaper for publishing.

Good morning. The H2S Contingency Plan has been scanned into OCD Online at "GW-028" under the "H2S Contingency Plan" thumbnail.

The most immediate concern to OCD based on the Plan is the ROEs (100 & 500 ppm) overlapping the nearby community and public health concerns. Fortunately, Navajo has maintained good communication throughout the Plan preparation and we discussed a plan for educating the public on what Navajo will do in the event of an H2S release that threatens public safety. Navajo is also working on Lovington Refinery Plan, which OCD expects to receive soon.

OCD's recommendation and in consideration of any recommendation(s) by OCD District Office Supervisor, Randy Dade, is: Navajo shall submit a draft of its public notice for the local newspaper(s) for OCD review and comment. We want the map to be shown, an explanation of what H2S and SO2 are and why they are dangerous, and the emergency action steps that Navajo will undertake to protect the community with a mail address and phone number for all incoming calls on the matter and letters to be logged and shared with the OCD. The OCD's position is that if there is significant interest voiced and/or documented by letter to Navajo, OCD feels it is in the best interest to hold a "Safety Meeting" open to the community where any questions, issues, etc. may be discussed with the community with the local Fire Marshal in attendance along with the OCD.

Please let me know your thoughts by next Friday COB with proposed date to submit your draft to Randy and I so we can proceed to address the H2S Public Safety issues together for the Artesia Refinery. Thank you.

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To: 'Lackey, Johnny'
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD; christy.franklyn@schirmereng.com; swati.rao@schirmereng.com
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Approved. Thank you.

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Subject: RE: H2S Contingency Plan

Carl. I am working diligently with our consultant to finalize the Lovington H2S Contingency plan. We have the majority of the Plan complete, however due to the consultant's internal review and QA/QC, and our submittal of additional data for the worst case scenario; it appears we may not be ready to submit the Final Plan for your review by end of business today. Will you allow us an extension of 2 days to ensure I have an accurate Plan to submit for review? If you grant the extension I will submit the Plan by EOB on Friday, 4/30/10.

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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, April 08, 2010 8:23 AM
To: Lackey, Johnny
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael;

Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan

Johnny:

Hi. I'm sorry, due to our work load, it is difficult to pin down a date for OCD review and comments. I recommend that Navajo Refining Company (NRC) submit its H2S Contingency Plan for Lovington in its final form in order to satisfy the intent of the OCD H2S Regulations. The OCD will be reviewing them and may have comments at a later date where we can work together to resolve any outstanding issues. NRC should be looking over the OCD regulatory requirements and making sure you address them in you final report. For example, you should have reviewed the API Guidance referenced in the OCD Regulations to ensure you have also complied with the guidance. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

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Subject: RE: H2S Contingency Plan

Carl. We are working on the Lovington Plan and should have it ready for your review by April 28, per your attached email. I was hoping to see comments on Artesia so any changes/comments could be incorporated in the Lovington Plan prior to submittal.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, April 08, 2010 7:24 AM
To: Lackey, Johnny
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Johnny, et al.:

Good morning. Where is the Lovington Refinery H2S Contingency Plan? Thank you.

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Sent: Friday, February 05, 2010 1:48 PM
To: Lackey, Johnny
Subject: H2S Contingency Plan

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Subject: RE: H2S Contingency Plan
Attachments: Navajo H2S CP Plot Plan.pdf; Navajo H2S Contingency Plan.pdf

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Lackey, Johnny

Modified: Thu 4/1/2010 2:07 PM

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Dept.

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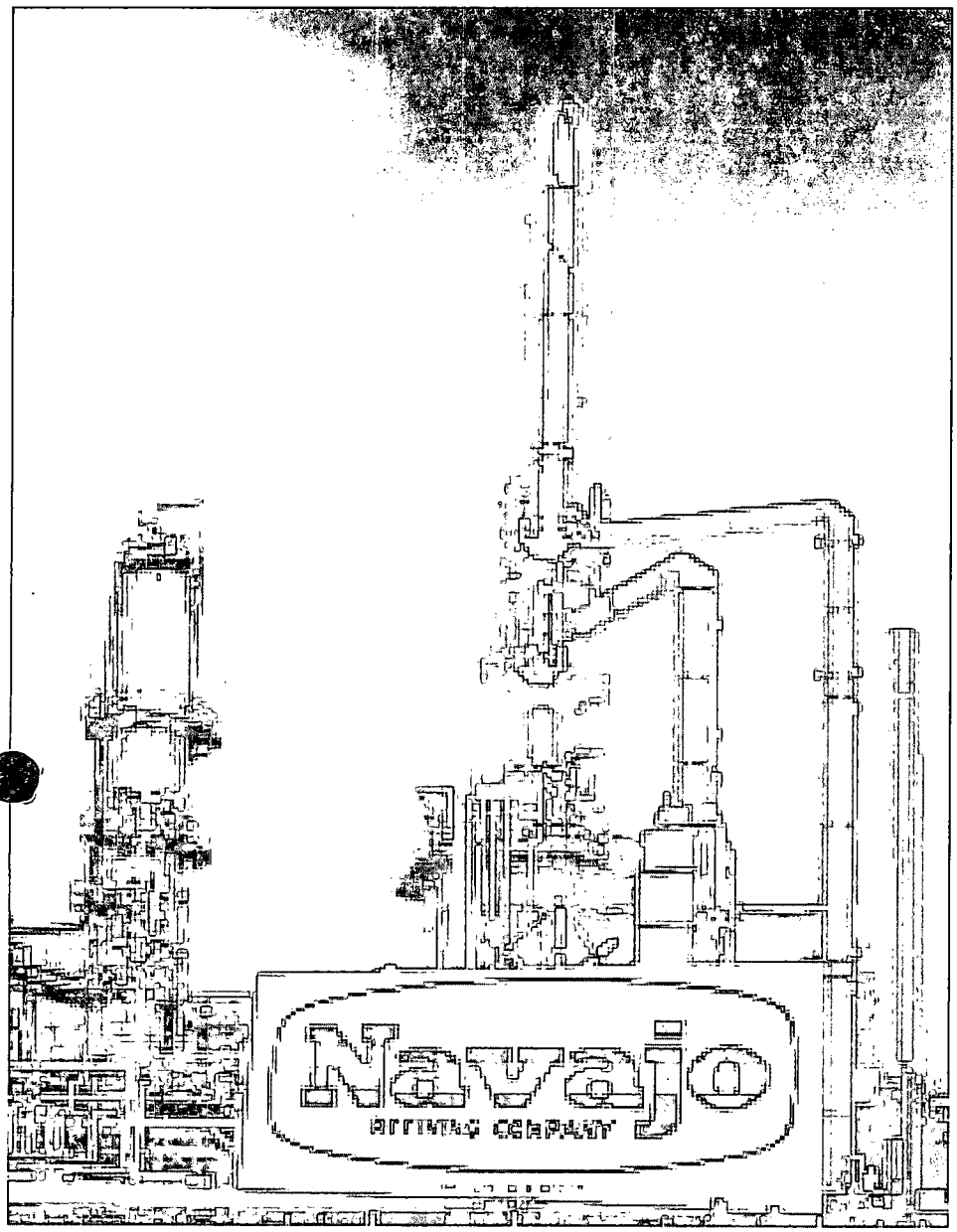
Office: (505) 476-3490

Navajo Refining Company
Artesia, NM



H2S Contingency Plan

Navajo Refining Company

Artesia Refinery

Artesia, New Mexico

March 2010

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ARTESIA REFINERY
NAVAJO REFINING

- ***INTRODUCTION***

The facility is a petroleum refinery which processes crude oil into asphalt, diesel fuel, naphtha, gasoline, kerosene, and liquefied petroleum gas (LPG). This facility:

- Processes crude at a combined rate of 100,000 barrels per day (bbls/day)
- Receives ~ 40,000 bbls/day of this volume from the Lovington Refinery
- Has an approximate total storage capacity of 1,256,902 barrels (bbls)
- Has an average storage volume of 500,000 to 750,000 bbls

Loading/unloading operations are conducted on a 24 hour, seven (7) day per week basis. The operations are listed in Table 1.

Table 1. Loading and Unloading Operations

Truck Loading	Truck Unloading	Rail Car Loading	Rail Car Unloading
Asphalt	Asphalt	Asphalt	LPG
Carbon Black Oil	Gas Oil	Carbon Black Oil	
Diesel Fuel/Gasoline	Crude Oil	Diesel Fuel	
LPG	Bulk Chemicals	Slurry	

1.1 Plant Description and Map

The Navajo Refinery is located in Artesia, Eddy County, New Mexico. It is owned and operated by Navajo Refining Company, a wholly owned subsidiary of Holly Corporation. Table 2 provides details on Navajo Refinery's location.

Table 2. Navajo Refinery Location

Physical Address:	501 E. Main Street, Artesia, NM 88211-0159
Mailing Address:	P.O. Box 159, Artesia, NM 88211-0159
Latitude:	32.842
Longitude:	-104.391

The location of the Navajo Refinery is illustrated in Figure 1.

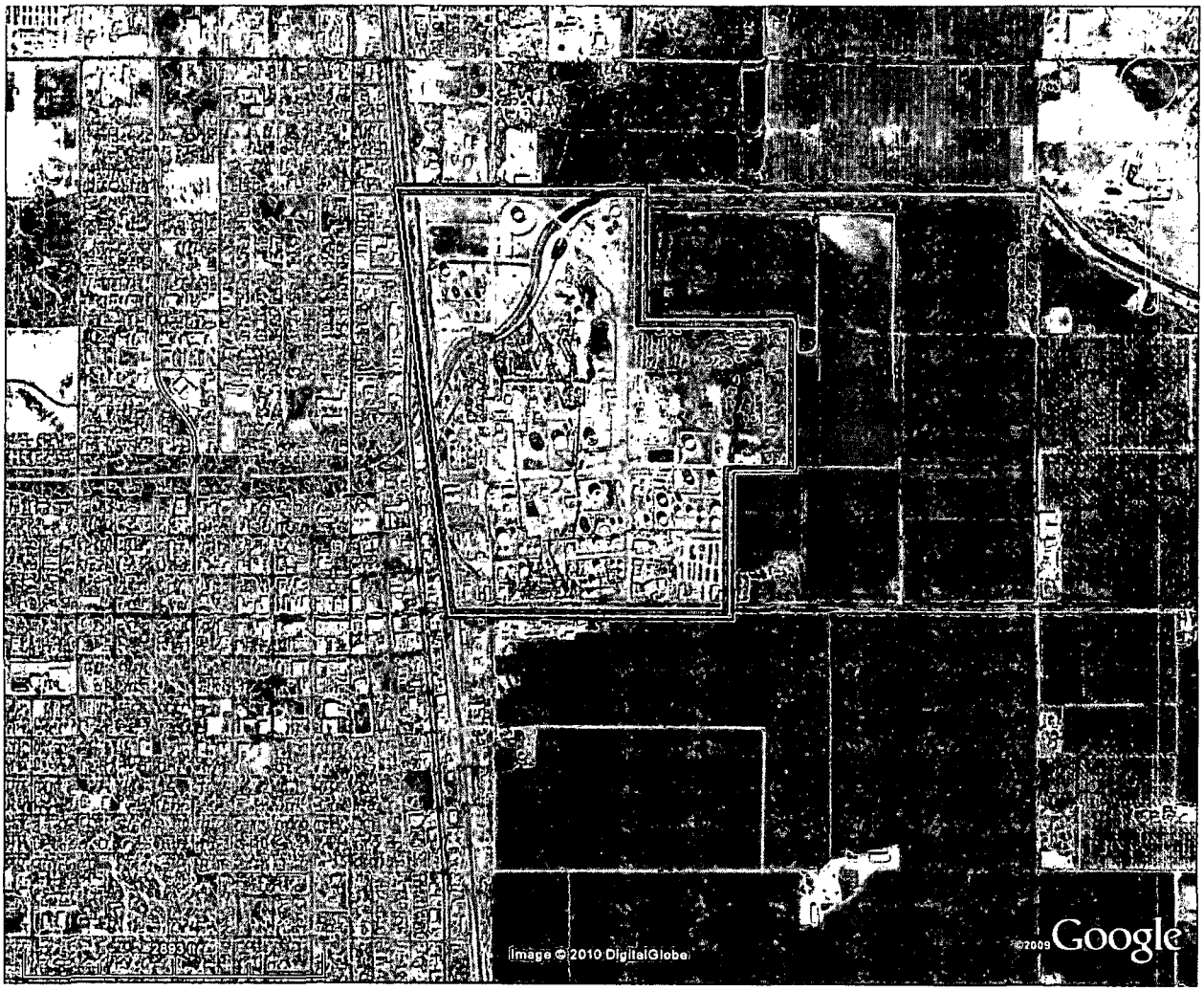


Figure 1. Location of Navajo Refinery (Approximate Boundaries)

1.2 Description of Operations

The Navajo Artesia refinery processes crude oil as well as intermediates received from outside sources such as Navajo's Lovington, NM refinery and other third-party sources. Crude oil and intermediates are purchased as needed or as justified on an economic basis. The crude oil and other intermediates enter the Artesia refinery via pipeline, truck, or rail. The Artesia refinery produces butane, propane, liquefied petroleum gas (LPG), jet fuels, kerosenes, diesel fuels, various grades of gasoline, carbon black oil (CBO), gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia refinery produces refinery fuel gas, hydrogen, nitrogen, and steam. The combined facility charge capacity is approximately 100,000 bbl/ day.

Process units at the refinery include:

- Alkylation Unit
- Amine Unit
- Atmospheric Crude Distillation Units
- Boilers
- CCR Reformer
- Cooling Towers
- Crude Oil Receiving and Storage
- Diesel Hydrotreating Unit
- Flares
- Flasher/Vacuum Distillation Unit
- Fluid Catalytic Cracking Unit
- Gas Oil Hydrotreating Unit
- Hydrocracking Unit
- Hydrogen Production Units
- Isomerization (or Penex) Unit
- Kerosene Hydrotreating Unit
- LPG Pressure Tanks
- MEROX®/Merichem Treaters
- Naphtha Hydrotreating Units
- PBC Butane Splitter Unit
- Saturates Gas Plants
- Solvent De-Asphalting Unit (ROSE Unit)
- Sour Water Strippers
- Storage Tanks
- Sulfur Recovery Units
- Utility and Vessels
- Wastewater Collection and Treatment System

H_2S is produced by processing (primarily by hydrogen de-sulfurization) products distilled from crude oil, naphtha, kerosene, diesel, and gas oils at the Artesia Refinery. Small amounts of H_2S are present in crude oil and are recovered during distillation into fuel gas. Sour gas streams produced by processing and sour fuel gas from the crude unit are contacted with amine to recover H_2S from sour gas streams. The amine solution that absorbs the H_2S is circulated to a steam re-boiled Stripping Tower to regenerate the amine for re-use in contacting sour gas. The off-gas from the Amine Stripping Tower is sent to a Sulfur Recovery Unit (SRU) to convert the H_2S into elemental sulfur.

The Sulfur Recovery Units have the highest concentration of H_2S.

1.3 Sulfur Recovery Units (SRUs)

The Artesia Refinery currently uses two, three-stage Claus sulfur recovery units (SRU1 and SRU2), a common tail gas treatment unit (TGTU), and a common tail gas incinerator (TGI). Navajo also has an additional sulfur recovery unit (SRU3). The new SRU has its own TGTU (TGTU3) and its own TGI (TGI3).

The sulfur recovery process significantly reduces air pollution and generates steam for refinery consumption.

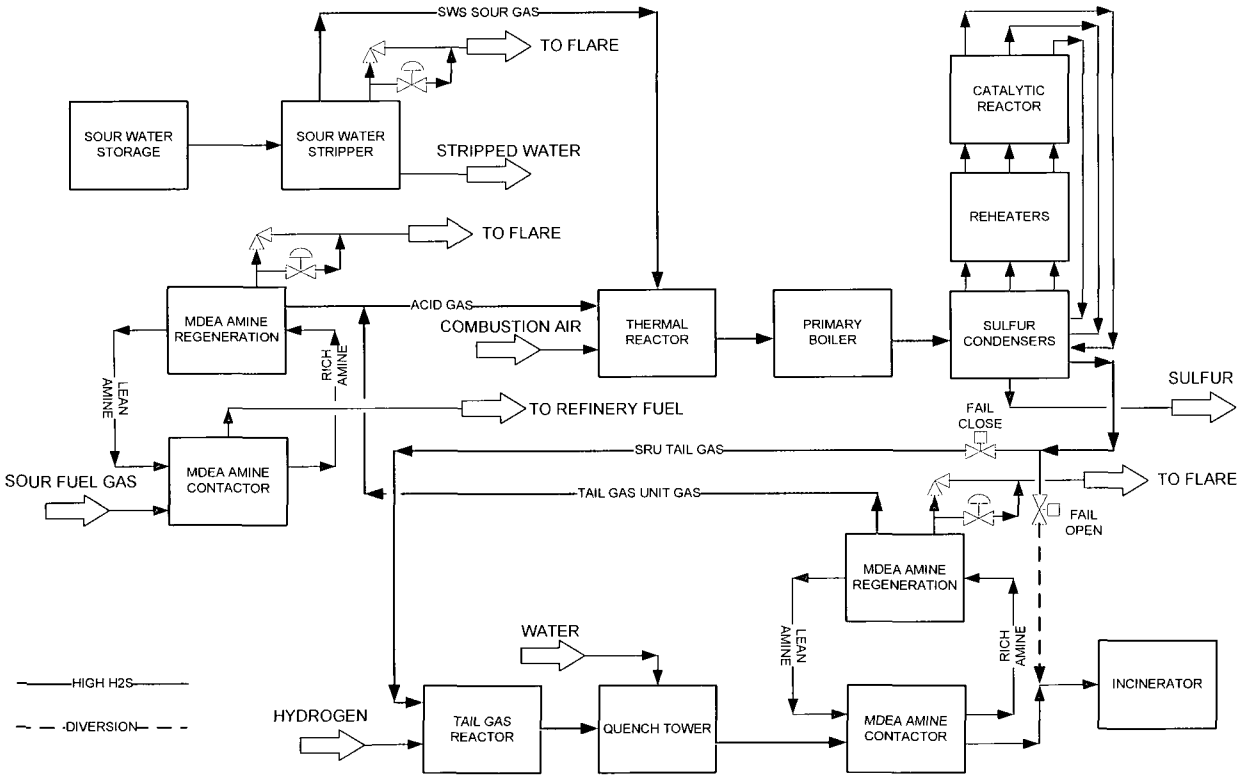
A Claus sulfur recovery unit converts H_2S to elemental sulfur by first oxidizing one-third of the H_2S to SO_2 to form elemental sulfur.

The acid gas first passes through knockout drums designed to remove entrained sour water and condensed hydrocarbons from the amine acid gas and the sour water stripper gas. The gases are then fed to a thermal reactor. Heat for the reactor is provided by the combustion of the acid gas.

Tail gas containing unrecovered sulfur compounds flows from the SRU to the TGTU where the sulfur compounds pass through a reactor converting the sulfur compounds into the H_2S. The reactor effluent then flows into a vessel for contact with lean (low sulfur) amine solution. The H_2S is absorbed by the amine while the treated tail gas flows to the TGI for combustion. The rich (high sulfur) amine solution then flows from the contactor to a stripper column, which regenerates, lean amine from rich amine by removing the H_2S. The concentrated H_2S gas stream produced by the stripper is recycled to the SRU. The regenerated lean amine is pumped back to the contactor for reuse.

The TGI will receive any remaining gases from the TGTU, as well as the vent stream from the sulfur pit. The TGI will further reduce H_2S emissions by combusting the H_2S to SO_2. Continuous emissions monitor systems (CEMS) will continuously measure and record sulfur dioxide (SO_2) concentrations in each TGI stack.

The sulfur recovery process is illustrated in Figure 2.



ARTESIA SULFUR RECOVERY

Figure 2. Navajo Artesia Refinery Sulfur Recovery Flow Diagram

- *THE H_2S CONTINGENCY PLAN*

1.4 Responsibility for Conformance with the H_2S Contingency Plan

It is the responsibility of all personnel onsite to follow the safety and emergency procedures outlined in the H_2S Contingency Plan, as well as the following documents:

- Navajo Refining Safety and Health Manual
- Navajo Refining Integrated Contingency Plan
- Navajo Refining Environmental Policies and Procedures
- Navajo Refining Operating Procedures

1.5 Revisions to the H_2S Contingency Plan

The H_2S Contingency Plan will be reviewed annually and revised as necessary to address changes to the facility, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected, especially those areas within the radii-of-exposure.

1.6 Availability of the H_2S Contingency Plan

The H_2S Contingency Plan will be available to all personnel responsible for implementation of the plan. A copy of the H_2S Contingency Plan will be available on the Holly Corp intranet site (Flashpoint) and hard copies will be available in the Safety, Environmental, Plant Manager, Operations Manager, Maintenance, PSM offices and in each plant control room. See Appendix H for the H_2S Contingency Plan Distribution List.

1.7 Content of the H_2S Contingency Plan

As a minimum, the H_2S Contingency Plan will contain:

- The characteristics of H_2S
- A facility description, map and/or drawings
- Emergency procedures to be followed in the event of a release of H_2S
- Information regarding training and drills to be conducted related to the H_2S Contingency Plan

- *H_2S CONTINGENCY PLAN DESIGN CONSIDERATIONS*

1.8 Definitions

Immediately Dangerous to Life and Health (IDLH) - The atmospheric concentration of a toxic, corrosive or asphyxiant substance that creates an immediate threat to life or could cause irreversible or delayed adverse health effects, or could interfere with an individual's ability to escape from a dangerous atmosphere.

Parts per million (ppm) - A unit of measure, one equal part of a substance per one million equal parts of air.

Permissible Exposure Limit (PEL) - The employee's 8-hour time weighted average which shall not be exceeded at any time during a work day.

Short Term Exposure Level (STEL) - is the employee's 15-minute time weighted average, which shall not be exceeded at any time during a work day unless another time limit is specified.

Time Weighted Average (TWA) - The employee's average airborne exposure in an 8-hour work shift of a 40-hour work week, which shall not be exceeded.

1.9 General Information

Hydrogen sulfide is a highly toxic, colorless and flammable gas which burns with a blue flame. When burned it produces SO2 or sulfur dioxide which is also a poisonous gas. It is slightly heavier than air, and is usually associated with the smell of rotten eggs. This strong and distinctive odor is evident at concentrations as little as 1 ppm. At high concentrations, the olfactory nerves become fatigued and paralyzed; therefore, the sense of smell shall never be used as the sole detector of H_2S. Respiratory protection guidelines must be stringently followed because inhalation is the primary route of exposure.

Generally, H_2S can be found in all plant areas that contain crude oil, refinery fuel gas, sour water or unit areas which remove and process H_2S and/or sulfur. H_2S containing process piping and equipment may be identified by H_2S warning signs. However, due to the close proximity of operating units and nature of the refining process, warning signs are not intended to indicate every potential H_2S area.

All personnel entering H_2S areas shall visually locate wind socks and note wind direction. If expected to do anything except evacuate immediately upon the onset of an alarm, they shall identify the location and be trained to use 30-minute SCBAs. Fresh air equipment shall be used for initial opening of H_2S containing process equipment and/or piping. Be aware that there may be additional requirements for work in some areas in the facility, or for special work. Hot Work Permits and Confined Space Entry Permits are examples of such circumstances.

1.10 Hydrogen Sulfide

Hydrogen sulfide properties and characteristics are described in Table 3.

Table 3. H_2S Properties and Characteristics

CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Auto ignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues and nerves

1.10.1 H_2S Exposure Limits and Effects of Exposure

H_2S exposure limits and effects of exposure are described in Table 4and Table 5.

Table 4. H_2S Exposure Limits

PEL	10 ppm
STEL	15 ppm
IDLH	100 ppm

Table 5. H_2S Affects of Exposure

Concentration	Effect
0.05 ppm	Rotten egg odor, detectable by most people.
0.13 - 30 ppm	Obvious and unpleasant odor.
50 - 150 ppm	Olfactory fatigue (temporary loss of smell) and marked dryness and irritation of the nose, throat and respiratory tract. Prolonged exposure may cause runny nose, cough, hoarseness, headache, nausea, shortness of breath, and severe lung damage (pulmonary edema).
200 - 250 ppm	Worsening and more rapid onset of the above health effects; possible death in 4 to 9 hours.
300 - 500 ppm	Excitement, severe headache and dizziness, staggering, loss of consciousness, respiratory failure likely in 5 minutes to an hour. Possible death in 30 minutes to 4 hours.
500+ ppm	Rapid onset of severe toxicity, respiratory paralysis, and death. If not fatal, may cause long-term effects such as memory loss, paralysis of facial muscles or nerve tissue damage.
800 - 1000 ppm	May be immediately fatal after one or more breaths, resulting in an instant unconsciousness or "knock-down" effect.

1.10.2 Personal Protective Equipment

Approved respiratory protection for H_2S at the Navajo Refinery shall consist of the following:

- 30-minute SCBA (self-contained breathing apparatus)
- Supplied air-line respirator with 5 minute egress cylinder

1.10.3 Respiratory Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentrations of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

1.11 RADII of Exposure (ROE)

RRS/Schirmer evaluated the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas for the worst case release scenario (as described in Appendix A) of H_2S gas for Navajo refinery. The 100-ppm and 500-ppm ROE were calculated in compliance with API RP-55 and are shown in Table 6. The details of calculations, equations and other variables used to evaluate the ROE are discussed in Appendix B-Calculation for Radius of Exposure. A map showing 100-ppm and 500-ppm contours are contained in Appendix C.

Table 6. Radius of Exposure

Concentration of H_2S (ppm)	Distance (feet)
100	1505
500	771

- *EMERGENCY ACTION PROCEDURES*

1.12 Emergency Response Organization

Navajo Refining Company utilizes the Incident Command System (ICS) to manage emergency response activities. The ICS is a management tool which is readily adaptable to very small incidents as well as those of considerable significance. The ICS shall be implemented for all discharge incidents with staffing levels adjusted as required to meet the specific needs (size and severity of the incident. Response to a discharge originating from the Facility will be provided by the Emergency Response Team.

1.12.1 Qualified Individual

Vital duties of the Qualified Individual (QI) include:

- Activate internal alarms and hazard communication systems to notify all Facility personnel.
- Notify all response personnel, as needed.
- Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification.
- Notify and provide necessary information to the appropriate Federal, State, and Local authorities with designated response roles, including the National Response Center (NRC), State Emergency Response Commission (SERC), and local response agencies.
- Assess the interaction of the spilled substance with water and/or other substances stored at the Facility and notify response personnel at the scene of that assessment.
- Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion).
- Assess and implement prompt removal actions to contain and remove the substance released.
- Coordinate rescue and response actions as previously arranged with all response personnel. Use authority to immediately access company funding to initiate clean-up activities.
- Direct clean-up activities until properly relieved of this responsibility.

The Refinery Vice President/Manager serves as Qualified Individual (QI) and the Operations Manager serves as the Alternate Qualified Individual (AQI). Arrangements are made to ensure that either one or the other is available on a 24-hour basis and is able to arrive at the Facility in a reasonable time. The AQI shall replace the QI in the event of his absence and have the same responsibilities and authority.

1.12.2 Emergency Response Team

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by qualified management personnel.

The number of positions/personnel required to staff the Emergency Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the IC directly or delegated as the situation demands.

The IC is always responsible for directing the response activities and will assume the duties of all the primary positions until the duties can be delegated to other qualified personnel.

The Emergency Response Team is shown on the organization chart in Figure 3.

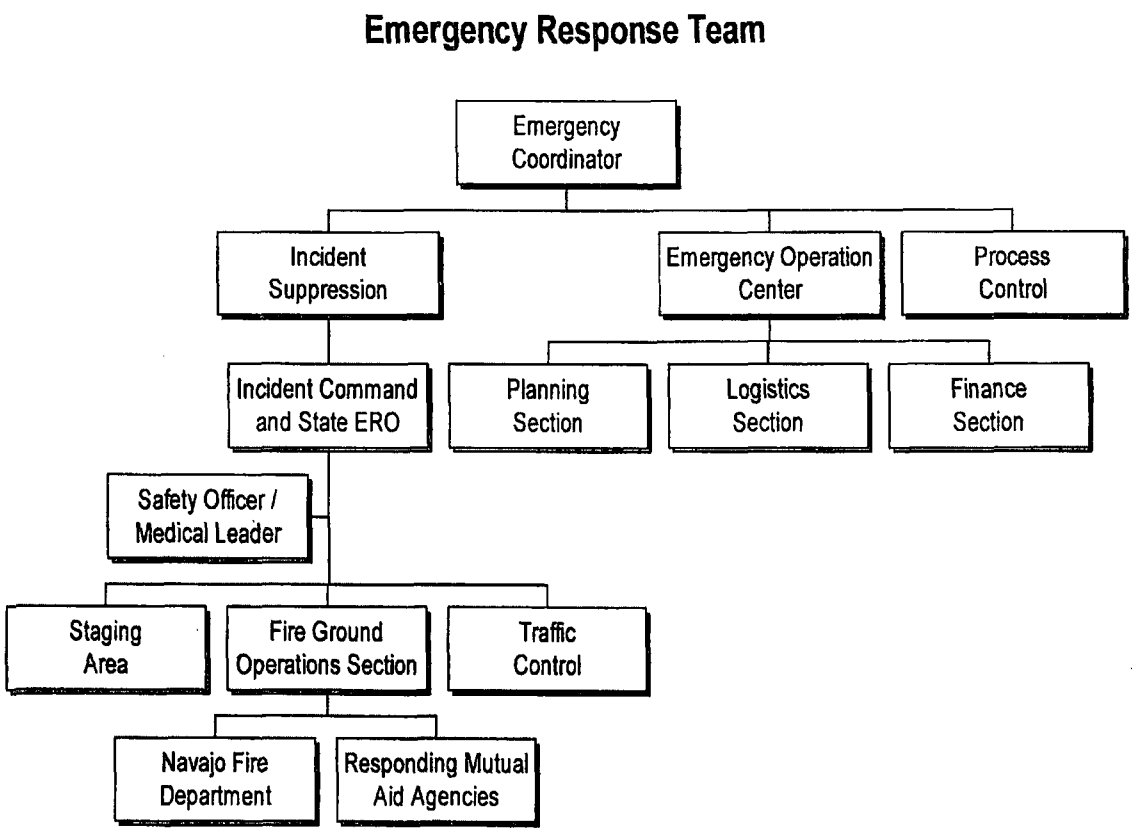


Figure 3. Emergency Response Team

1.13 Emergency Response

1.13.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1.13.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

1.13.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's training program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Immediately notifying Central Dispatch by:
  - Activating the Emergency Alarm System
  - Announce twice over the operating channel for that location "(type of emergency) at (location)"
  - Once the alarm is received, the alarm point will be contacted by Central Dispatch to verify the problem and gather any additional information about the situation. The person responsible for sounding the alarm should use this opportunity to tell Central Dispatch where the emergency is and the nature of the emergency (i.e., fire, spill, H_2S release)
  - After verifying the alarm, Central Dispatch will follow the appropriate procedure based on information received during the alarm verification

1.13.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. Response actions contained in Appendix F.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. **Without exception, personnel and public safety is first priority.**

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management.

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills that are contained on refinery property as opposed to spills that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

The potential for a spill to migrate out from refinery property is reduced since the Artesia refinery provides secondary containment protection through a process wastewater collection system from each process unit and loading area, secondary containment dikes around the bulk storage tanks. -Based on the site topography, spills or releases from the site flow northeast and the northeastern perimeter earthen bank is approximately eight feet high. These structures in conjunction with the diversion swale along the south face of Eagle Draw, flat slopes on-site, and a desert environment combine to effectively contain most spills on facility property. However, in the unlikely event that discharges escape the confines of the facility, emergency procedures have been established.

1.13.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate
- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials

- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

1.13.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums
- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

1.13.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO2.

Acid gas flaring will be initiated when the SRUs are unable to treat acid gas. The Amine Regeneration (Steam Reboiled Strippers) is equipped with a pressure control valve with a set-point higher than normal operating pressure of the stripper. With the acid gas blocked during a SRU trip, the pressure on the Stripper will increase until the pressure control valve set-point to flare is exceeded. The Stripper will then begin to send acid gas to the flare to maintain the pressure of the Stripper. Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined.

1.13.6 Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

1.13.7 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at concentrations higher than 10 ppm. A remote alarm is initiated in the control room along with local beacons and alarms located in the unit.

1.13.8 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

1.13.9 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

1.13.9.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external notification and reporting obligations associated with the activation of this H_2S Contingency Plan. Internal notifications should be made for each emergency incident to the extent that the incident demands as described on the checklists provided as **Table 4**.

1.13.9.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If the Plant personnel detects H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Safety Manager, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.

- Once the Safety Manager is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. refinery management will then conduct further reporting that is necessary based on the situation.
- Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

1.13.9.3 External Notification

The following guidelines should be remembered when reporting spills:

- Never include information that has not been verified
- Never speculate as to the cause of an incident or make any acknowledgement of liability
- Document:
  - Agency Notified
  - Date/Time of Notification
  - Person Notified
  - Content of Message Given
- DO NOT DELAY reporting due to incomplete information

Appendix G contains the Emergency Call List.

1.13.9.4 Site Security

The security measures in place for the Facility perimeter include fences and gates as follows:

- The refinery property is fully fenced and monitored by contract security guards 24 hours per day, 7 days per week.
- All plant entrances have automatic gates or are staffed with guards 24 hours per day.
- The Facility is manned by operating personnel 24 hours per day, 7 days per week.

1.13.9.5 Sign and Markers

The refinery has warning signs indicating the presence of H_2S at the entrance to the refinery. Signs are located at the plant entrances indicating that all visitors are to proceed to the main gate located at Freeman and Richey Streets to sign-in.

1.13.9.6 First-Aid Station

The first aid station will be located at the Emergency Assembly Area. First aid kits are located:

- All main office buildings
- Fire Station
- Warehouses
- Control Rooms

1.13.9.7 Media Site

If the H2S Contingency Plan is activated, the Media Site will be located at the Artesia Chamber of Commerce Conference Room.

At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

1.13.9.8 Emergency and Safety Equipment

There are 4 emergency response trailers at the Artesia Refinery. Three trailers are located at Holly Energy Partners office east of the refinery and one trailer is maintained inside the refinery boundary fence. A complete listing of the emergency response equipment is provided in **Appendix E**.

- ***TRAINING AND DRILLS***

1.14 All Employees

All Navajo Refining employees and contractor employees shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas
- The person(s) are working in a plant area which contains no possible H_2S exposures

Training information and documentation will be maintained by the Safety Department.

1.15 Response Team Training

Navajo has designated a Safety Training Coordinator in light of the significant training and record keeping requirements by the many different government agencies (i.e., DOT, OSHA, EPA and various state and local agencies). The training coordinator's duties include conducting, training and maintaining records for all employees which documents the content of and the applicable regulatory requirement for the training. In addition to training records, the coordinator also maintains records of safety meetings and other meetings related to environmental regulations.

All employees who work in operating areas of the refinery or have the potential to be exposed to the operating areas receive an initial 40 hours of comprehensive training emphasizing occupational safety, environmental compliance and process safety management. Employees receive 40-hour training at their initial employment and annual computer based training (CBT) refresher training thereafter to comply with requirements found in:

- 40 CFR 112.7(e) - SPCC Plan
- 40 CFR 112.21 - Facility Response Plan
- 40 CFR 262 - Hazardous Waste Contingency Plan

Common elements of all three of these programs include prevention, detection, and response to releases of oils and other hazardous materials. Training common to all three also includes emphasis on good housekeeping practices (Best Management Practices), secondary containment, and prompt initial notification of an incident.

1.15.1 Response Team Exercises

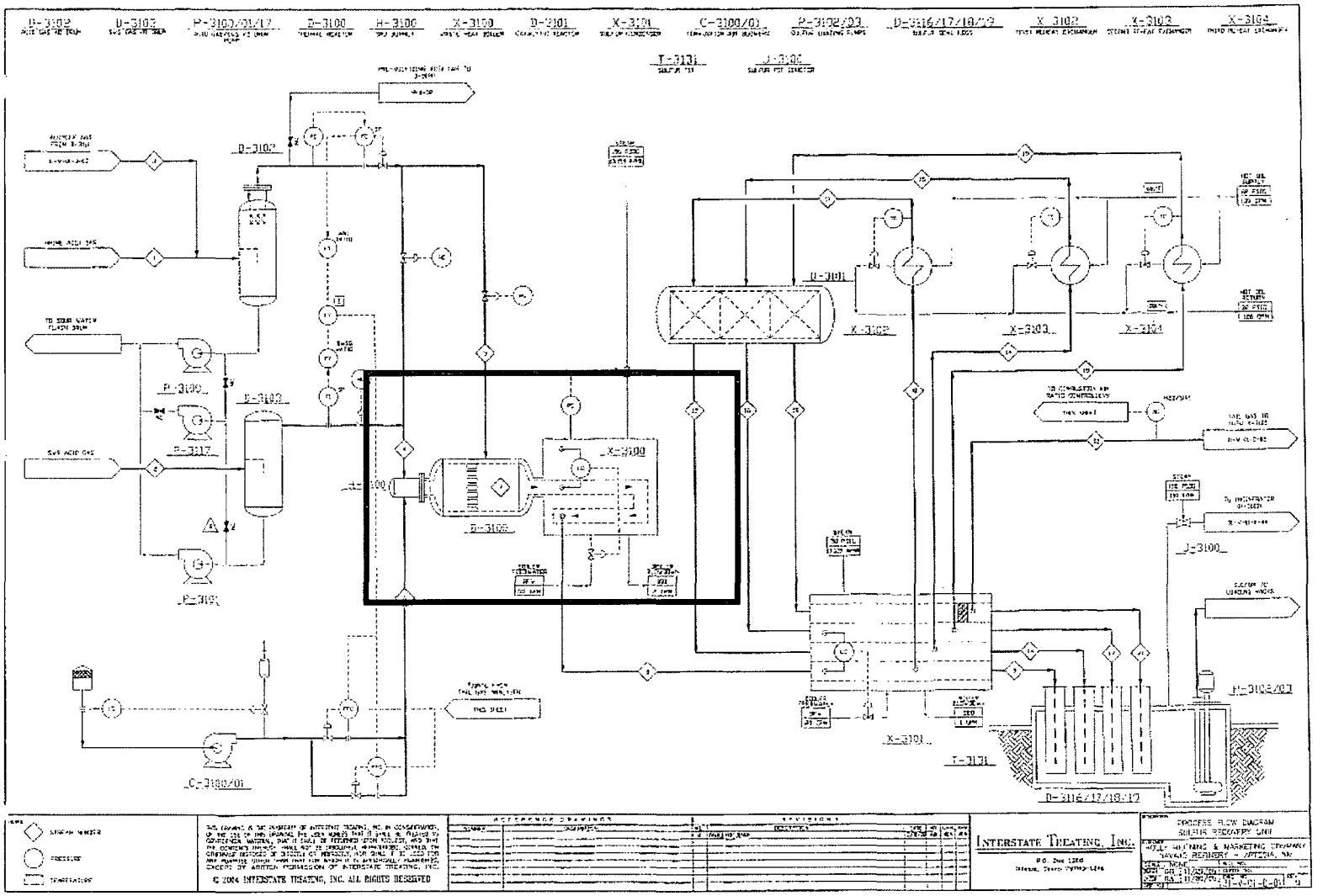
Emergency Response Team members, various agencies, contractors and other response resources will participate in emergency response exercises as required by federal, state, and local regulations and as detailed in the "National Preparedness for Response Exercise Program" (PREP). Navajo Refining Company will utilize announced and unannounced notification exercises, equipment deployment exercises, tabletop exercises, and/or various combinations to ensure that each component of the Plan is exercised as required. Exercises include:

- Annual Qualified Individual Notification Exercises
- Annual Equipment Deployment Exercise
- Annual Response Team Tabletop Exercise

APPENDIX A

WORST CASE SCENARIO FOR H_2S RELEASE

The worst case release scenario of H_2S gas was described by Navajo refining personnel to be the instantaneous release of contents of the thermal reactor (D-3100) located in Unit # 31 Sulfur Recovery Unit. The thermal reactor is shown in a red box in the *PFD* below.



APPENDIX B

CALCULATION FOR RADIUS OF EXPOSURE

To estimate the radius of exposure associated with an instantaneous release of H_2S due to the catastrophic rupture of a vessel, a calculation procedure from API RP-55, *Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide,* was adopted. The equation for predicting ROE for H_2S releases was taken from pg. 36 of Appendix C of API RP 55:

$$ROE = 10^{\left[A \times \log(H_2S) + B\right]} \quad \text{.....Equation 1}$$

Where ROE is H_2S radius of exposure, A and B coefficients contained in Table C-1 of API RP 55 (reprinted below), and [H_2S] is the amount of H_2S released. For continuous release, the H_2S release rate in entered in standard cubic feet per hour (SCFH) and for a puff (instantaneous) release the quantity of H_2S is entered in standard cubic feet (SCF).

Table C-1—Linear Regression Coefficients for Mathematical Predictions of ROE as a Function of Downwind Hydrogen Sulfide Concentration and Release Quantity/Rate

Time*	Type of Release	Concentration, ppm	Coefficients A	Coefficients B
Day	Continuous	10	0.61	0.84
Day	Continuous	30	0.62	0.59
Day	Continuous	100	0.58	0.45
Day	Continuous	300	0.64	-0.08
Day	Continuous	500	0.64	-0.23
Night	Continuous	10	0.68	1.22
Night	Continuous	30	0.67	1.02
Night	Continuous	100	0.66	0.69
Night	Continuous	300	0.65	0.46
Night	Continuous	500	0.64	0.32
Day	Puff	10	0.39	2.23
Day	Puff	30	0.39	2.10
Day	Puff	100	0.39	1.91
Day	Puff	300	0.39	1.70
Day	Puff	500	0.40	1.61
Night	Puff	10	0.39	2.77
Night	Puff	30	0.39	2.60
Night	Puff	100	0.40	2.40
Night	Puff	300	0.40	2.20
Night	Puff	500	0.41	2.09

*Day Meteorological Conditions: Stability Class PG D (Neutral)—5 mph Wind Speed.
*Night Meteorological Conditions: Stability Class PG F (Stable)—2.2 mph Wind Speed.

According to the information supplied by Navajo refining personnel, the thermal reactor and the associated piping contains a total volume of 5,800 cubic feet. The composition of the stream exiting that vessel from the heat and material balance sheets is as shown below:

Component	Composition (lb moles/hr)	Composition Mole %
Nitrogen	766	56
Hydrogen	13	1
Carbon monoxide	3	0.2
Carbon dioxide	7	0.5
Water	364	26
Sulfur dioxide	40	3
Hydrogen sulfide	80	6
Carbon disulfide	0.15	<0.1
Carbonyl sulfide	0.44	<0.1
Sulfur dimer	106	8
Total	1,380	100

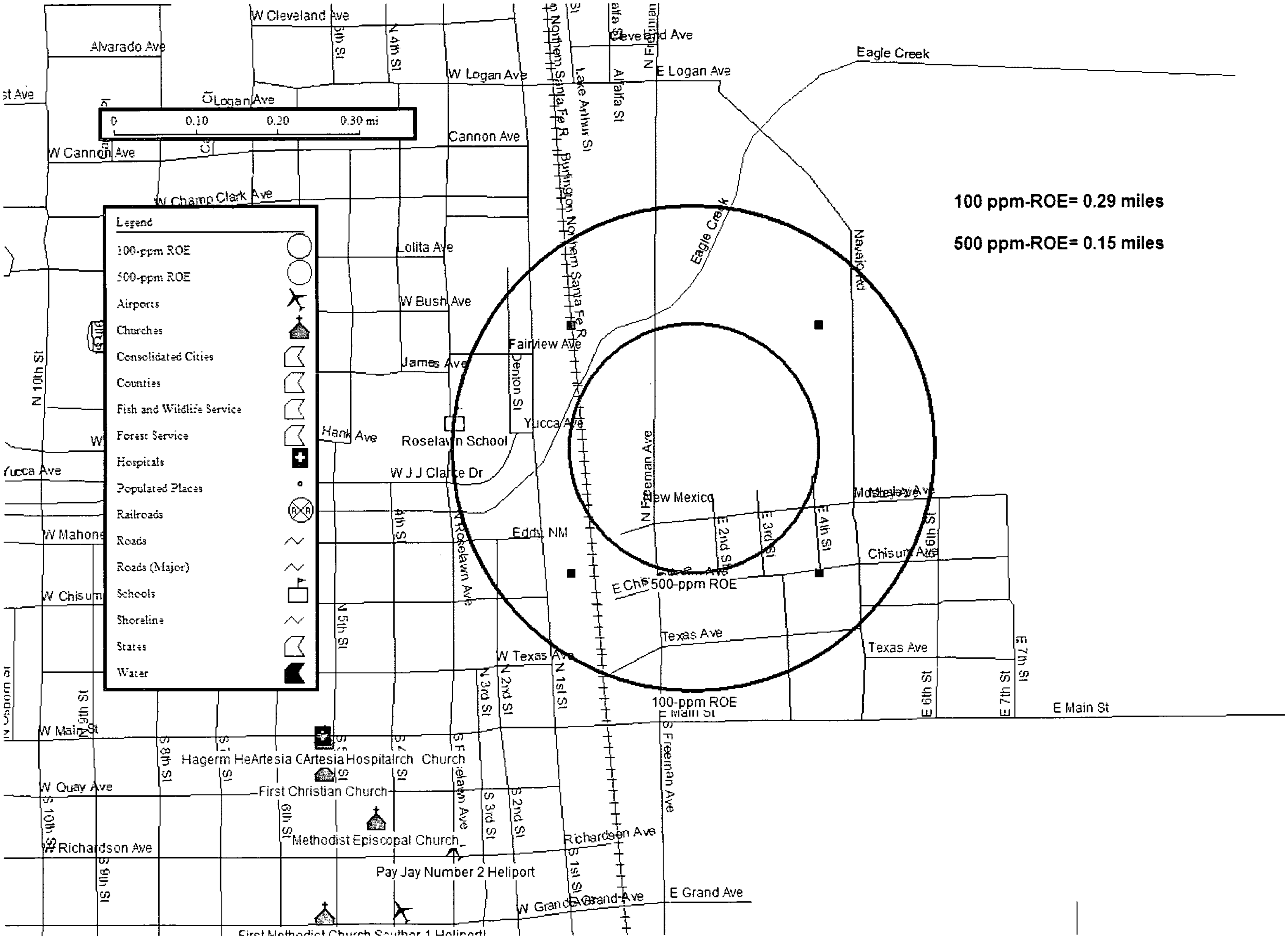
This stream was reported to be at a pressure of 20.6 psia and a temperature of 2416 degrees Fahrenheit. The composition of H_2S in the exiting stream is 6% by mole or volume fraction. Therefore, the maximum gaseous volume of H_2S in the vessel would be 6% of 5,800 cubic feet which is 348 cubic feet. At standard conditions of 14.73 psia and 60 degrees Fahrenheit, that volume would be equivalent to 88 SCF of H_2S. The coefficients A and B were taken from Table C-1 for night time conditions (to ensure the most conservative results), for puff releases (due to the instantaneous rupture scenario), and for 100 ppm and 500 ppm concentrations of interest. Radii of exposure for those two concentrations were calculated, as follows.

$$ROE - 100\,ppm = 10^{\left[0.40 \times \log(88) + 2.40\right]} = 1{,}505\,feet$$

$$ROE - 500\,ppm = 10^{\left[0.41 \times \log(88) + 2.09\right]} = 771\,feet$$

APPENDIX C

RADIUS OF EXPOSURE (ROE) MAP


100 ppm-ROE= 0.29 miles
500 ppm-ROE= 0.15 miles
Legend
100-ppm ROE
500-ppm ROE
Airports
Churches
Consolidated Cities
Counties
Fish and Wildlife Service
Forest Service
Hospitals
Populated Places
Railroads
Roads
Roads (Major)
Schools
Shoreline
States
Water
0
0.10
0.20
0.30 mi
Eagle Creek
Navajo Rd
E Logan Ave
W Logan Ave
W Cleveland Ave
Alvarado Ave
Cannon Ave
W Cannon Ave
W Champ Clark Ave
Lolita Ave
W Bush Ave
James Ave
Fairview Ave
Denton St
Yucca Ave
Roselawn School
W J J Clarke Dr
Hank Ave
Eddy NM
New Mexico
N Freeman Ave
E 2nd St
E 3rd St
E 4th St
E 6th St
E 7th St
Chisum Ave
500-ppm ROE
100-ppm ROE
Texas Ave
W Texas Ave
E Main St
W Main St
S Freeman Ave
Lake Arthur St
Alfalfa St
Burlington Northern Santa Fe R
N 10th St
N 5th St
N 3rd St
N 2nd St
N 1st St
S 8th St
S 9th St
S 10th St
S 3rd St
S 2nd St
S 1st St
6th St
W Mahone
W Chisum
W Quay Ave
W Richardson Ave
Richardson Ave
Yucca Ave
W Grand Ave
E Grand Ave
First Christian Church
Methodist Episcopal Church
Pay Jay Number 2 Heliport
Hagerm HeArtesia CArtesia Hospitalrch Church

APPENDIX D

PLANT DIAGRAM - EVACUATION ROUTES, H_2S MONITORING AND ALARM LOCATIONS

APPENDIX E

DESCRIPTION OF EMERGENCY RESPONSE EQUIPMENT

1. Portable Pumps — Location
   1. Blue Diesel Pump — Waste Water Treatment Plant
   2. New Portable Pump — North of Main Warehouse
   3. Red Gasoline Driven Pump — Tanks 437 & 439

2. Booms
   1. Spill Kit (see item no. 6) — Warehouse #4

3. Absorbents
   1. Spill Kit — Warehouse #4
   2. Sphag-Sorb Pillows — Warehouse #4
   3. Bail of Peat Moss — Warehouse #4

4. Hand Tools (Insert Copy of Tool list from MHM)

5. Fire Fighting & Personnel Protective Equipment - Operational Status: Good

Type & Year	Quantity	Storage Location
1980 Ford Mini Pumper w/125 GPM Scat Fire Apparatus Pump 50 gal. Foam Tank	1	Fire Station
1986 National Foam Pumper w/1250 GPM pump 500 GPM Deck Gun, 1000 gal. Foam Tank	1	Fire Station
Foam Trailer 1650 Gal.	1	Fire Station
National Foam 660 GPM Foam Tower	2	Fire Station
Portable Monitors	13	Fire Station

6. Other (e.g., Heavy Equipment, Boats, & Motors) - Operational Status: Good

Type & Year	Quantity	Storage Location
Front End Loader (1985 John Deere) 300B	1	Crane Shed N. of Main Whse.)
Vacuum Truck (1985 Mack)	1 70 barrel (bbl)	Crane Shed (N. of Main Whse.)
Lugger Bucket Truck	1	Crane Shed (N. of Main Whse.)

7. Communication Equipment - Operational Status: Good

Description	Quantity	Location
Telephones	205+	Throughout Facility
Base Radios	6	Throughout Facility
Portable Radios	56	Throughout Facility
Mobile Radios	22	Throughout Facility
Remote Radios	12	Throughout Facility
Pagers	19	Throughout Facility
Cellular Phones	11	Throughout Facility

8. Cellular phones

Cellular Phones Assigned To	Phone No.
Safety & Risk Manager (Bill Jones)	575-748-6779
Sr. Engineer Mgr (Jimmy Meeks)	575-308-8718
Sr. Maintenance Mgr (David Bolding)	575-365-2694
Sr. Operations Mgr (Ricky Swafford)	575-365-7873
Product Movement & Lab Mgr (David Latham)	575-746-5277
Refinery Mgr (Michael Whatley)	575-513-2276
Inspection Mgr (Jeff Beauregard)	575-365-4237
Sr. Environmental Mgr (Johnny Lackey)	972-261-8075

9. Emergency Response Trailer

5 packages of Hot Hog boom 3" X 10'

2 shovels

1 rake

1 push broom

1 pry bar

¾ cu ft of sphag sorb

1 box of nitrile gloves

6 pair rubber boots various sizes

8 pair of goggles

1 box of ear plugs

1 folding ladder

6 slicker suits

2 portable lights

2 extension cords

2 – 4 inch tie down straps

2 – Full body harnesses

Several pair of cloth gloves

Several pair of rubber gloves

5 folding chairs

1 large water gel blanket

1 generator

2 rescue blankets

Caution tape

1 roll of black plastic

Various hand tools

Air drill

Sash cord

1 decontamination sprayer

Scrub brushes

Gas can

APPENDIX F

H_2S CONTINGENCY PLAN - RESPONSE

H2S Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentration of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

Detection - Personal Monitoring Equipment

Personal H_2S monitors used in the facility should alarm at the PEL (10 ppm) and STEL (15 ppm). Monitors may or may not have direct reading capabilities. Employees should wear a personal H_2S monitor at all times when working in the process units and Blender/Tank Farm locations. The monitors should be worn within the "breathing zone", unobstructed by clothing or equipment and such that the employee can readily perceive the alarms. The breathing zone is a 1.5-foot radius in all directions centered at the nose and mouth.

Alarm protocol

If a personal monitor alarms at the low alarm (PEL), personnel must leave the area and obtain fresh air equipment to complete the work task.

Detection - Fixed Monitoring Equipment

Fixed H2S monitors are located in the refinery in the North Plant and the CCR. The fixed H_2S monitors have two alarm set points. The alarm set points and responses are as follows:

- First set point: 20 ppm
  - Response: Activates alarm in the control rooms
- Second set point: 50 ppm
  - Response: Activates alarm in the control room. Activates strobe lights and an audible alarm in affected unit area(s).

Alarm protocol:

In the event a fixed monitor alarms at the first set point of 20 ppm:

- Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
- Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
- Operations personnel may remove any personnel using proper respiratory protection at their discretion.
- Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

In the event a fixed monitor alarms at the second set point of 50 ppm:

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). **IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).**
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.

Emergency Procedures

All emergency procedures for fire, facility evacuation, earthquake, etc shall be followed as outlined in the **Emergency Response Plan**.

In the event of an H_2S release:

- Wear appropriate respiratory protection if available.
- Make note of wind direction and evacuate upwind or cross wind from the affected area(s).
- Check in with Operations once outside the affected area(s).

First Aid/Rescue Procedures:

- Activate the alarm.
- Never attempt to rescue a downed victim without proper respiratory protection. Proper respiratory protection for rescue purposes is fresh air in the form of a 30-minute SCBA.
- Remove victim to fresh air.
- Check victim for breathing and pulse. If qualified, administer CPR as needed until help arrives.

Information and Training

All NRC employees and contractor employees shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas, or
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas, or
- The person(s) are working in a plant area which contains no possible H_2S exposures.

Training information and documentation will be maintained by the Safety Department.

APPENDIX G

EMERGENCY CALL LIST

Navajo Refining Internal Notifications

Internal Notifications				
Organization	**Name**	**Office**	**Home**	**Other**
Emergency Coordinator Refinery VP/Manager (Qualified Individual):	Michael Whatley	(575) 748-3311 ext. 743	(575) 746-2096	(575) 513-2276
Alternate Qualified Individual Manager, Operations	Ricky Swafford	(575) 748-3311 ext. 244	(575) 746-0036	(575) 746-6746
Incident Commander Safety & Risk Manager:	Bill Jones	(575) 748-3311 ext. 779	(281) 217-0897	(575) 308-9503
Fire Chief	King Kelley	(575) 748-3311 ext. 465	(575) 746-0036	Plectron Notification (575) 365-7508
Safety Officer/Medical Officer Safety Department	Kent Bratcher	(575) 748-3311 ext. 410	(575) 746-3268	Plectron Notification (575) 365-7995
Manager of Environmental for Water and Waste	Darrell Moore	(575) 748-3311 ext. 281	(575) 703-5058	(575) 703-5058
Logistics Section Maintenance Director	David Bolding	(575) 748-3311 ext. 444	(575) 365-2694	(575) 746-7646
Asst. Maintenance Supervisor	Trampas Spence	(575) 748-3311 ext. 395	(575) 365-2993	(575) 365-5071
Planning Section Maintenance Director	David Bolding	(575) 738-3311 ext. 444	(575) 365-2694	(575) 746-7646
Logistics Section Maintenance Department Coordinator	David Rowland	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section Purchasing Department	Mark Sanderson	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section – Expediter Purchasing Department	Jon Ross	(575) 748-3311 ext. 325	(575) 746-6452	(575) 365-4244

Navajo Refining External Notifications

Required External Notifications			
Agency	**Location**	**Office**	**Alternate**
National Response Center (NRC)	Washington, D.C.	(800) 424-8802	(202) 267-2675
Roswell State Police (SERC)	Roswell, NM	(575) 827-9223	(575) 622-7200
NM Energy, Minerals, and Natural Resources Department (OCD)	Artesia, NM (District 2)	(575) 748-1283	
Local Emergency Planning Committee (LEPC)	Carlsbad, NM	(575) 887-9511	(575) 887-7551
Assistance/Advisory Notifications (outside resources)			
Agency	**Location**	**Office**	**Alternate**
New Mexico Department of Game and Fish	Roswell, NM	(575) 624-6135	(575) 748-3036
New Mexico OSHA Bureau	Santa Fe, NM	(575) 827-2888	
OSHA (For Reportable Injury or Death)	Washington, D.C.	(800) 321-6724	
U.S. Environmental Protection Agency (EPA) Region IV	Dallas, TX	(800) 887-6063	(214) 665-2200
U.S. Fish and Wildlife Services (USFWS)	Albuquerque, NM	(505) 346-2525	
Bureau of Land Management (BLM)	Santa Fe, NM	(505) 438-7501	
New Mexico Health and Environmental Department	Santa Fe, NM	(505) 827-3723	
New Mexico Fire Marshal	Roswell, NM	(575) 347-5700	
National Weather Service (Recorded Forecasts) (NOAA)	Roswell, NM	(575) 347-5700	
Local Water Supply System	Artesia, NM	(575) 746-2122	(575) 746-2703
Local Emergency Services			
Agency	**Location**	**Office**	**Alternate**
Artesia Fire Department	Artesia, NM	911	(575) 746-2701
Eddy County Sheriff	Artesia, NM	911	(575) 746-9888
Artesia City Police	Artesia, NM	911	(575) 746-2703
Artesia Ambulance	Artesia, NM	911	(575) 746-2701
Artesia General Hospital	Artesia, NM	(575) 748-3333	
Eastern New Mexico Medical Center	Roswell, NM	(575) 622-1110	
Guadalupe Medical Center	Carlsbad, NM	(575) 887-4100	

Other Emergency Resources

Oil Spill Removal Organizations (OSRO)			
Company	**Location**	**Office**	**Alternate**
TAS Environmental Services, Inc.	Fort Worth, TX	(888) 654-0111	(800) 442-7637
Additional Response Recourses			
Company	**Location**	**Office**	**Alternate**
Indian Fire & Safety	Artesia, NM	(575) 393-3093	(800) 530-8693
I/W Hot Oil - Transports Service	Artesia, NM	(575) 746-4214	
Gandy Corporation - Transports Service	Lovington, NM	(575) 396-4948	
Jim's Water Service - Transports Service	Artesia, NM	(575) 748-1352	(575) 748-1352
O.K. Hot Oil	Loco Hills, NM	(575) 746-6233	
Swett Construction - Dirt Equipment	Artesia, NM	(575) 748-1238	
Davis Welding - Dirt Equipment	Artesia, NM	(575) 746-6306	
T&C Tank Rental - Temporary Storage	Artesia, NM	(575) 746-9788	
International Bird Rescue Center	Fairfield, CA	(707) 207-0380	
Tri-State Bird Rescue	Newark, NJ	(302) 737-9543	
KBIM - TV	Roswell, NM	(575) 622-2120	
KSVP - AM Radio	Artesia, NM	(575) 746-2751	

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

DISTRIBUTION

COPY #	LOCATION
1	SAFETY LIBRARY
2	ENVIRONMENTAL FILE ROOM
3	ENVIRONMENTAL MANAGER
4	PLANT MANAGER
5	OPERATIONS MANAGER
6	MAINTENANCE OFFICE
7	PSM COORDINATOR
8	NORTH CONTROL ROOM
9	SOUTH CONTROL ROOM
10	CORPORATE EH&S

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, March 31, 2010 4:48 PM
To: 'Lackey, Johnny'
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan

Johnny:

Please send it as the final contingency plan for OCD review. The OCD does want to review draft documents. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Wednesday, March 31, 2010 4:42 PM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan
Importance: High

Carl.

Attached is Navajo's DRAFT H2S Contingency Plan for your review/comment/approval. I will be sending via FedEx a hard copy of the plan also. I'm attaching the plot plan separately since the letter size doesn't show up well in the electronic version. The hard copy you will receive will include a color coded "D" sized drawing.

As we discussed, once the plan is approved, Navajo will prepare a "Public Notice" for the local newspaper to publish which will serve as notice to those that may be affected by a release from the refinery. I will send a copy of the proposed release to you for review and approval before sending to the newspaper for publishing.

The previous submittal was not intended to be the Draft Plan but to present our proposed "worst Case" scenario for your OK so we could develop the plan around that scenario.

Let me know if you need additional information or have any questions regarding this submittal.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, March 12, 2010 4:35 PM
To: Lackey, Johnny
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; Christy_Franklyn@schirmereng.com; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan

Johnny:

The OCD has completed a review of your proposal for the above subject plan for the Artesia Refinery, and I presume would form the basis for the plan for the Lovington Refinery.

In general, the proposal to use the "PHAST" Model to model H2S Gas does not appear to be appropriate (see link http://cfpub.epa.gov/crem/knowledge_base/crem_report.cfm?deid=196448&view=PDF) where the model primary purpose is for simulating multi-component, reactive solute transport in 3-d saturated ground water flow systems, which is clearly not a gas transport model recommended in OCD Hydrogen Sulfide Regulations.

I notice that I don't see maps with detector locations, wind socks, location of "poison gas signs", location of units with flow where ROEs (100 and 500 ppm) would be depicted in public areas surrounding the refinery. Consequently, I am attaching the OCD's Regulations that references API Guidance, which is also not referenced in your proposal. Please take a look at the OCD Regulations and requirements and submit a H2S Contingency Plan that will address the regulations. The OCD provided an example (GW-33) from a Gas Plant that Navajo Refining Company should be using to develop a plan.

See OCD approved H2S Contingency Plan at OCD Online (GW-33) at http://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pENV000GW00034.

See attached OCD H2S Regulations to cross-check to make sure your plan addresses OCD Regulations. Also, information on the Pasquil-Gifford Model is attached to help you find another gas dispersion model or you can simply use this user friendly model to complete the plan (ROEs).

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Wednesday, March 10, 2010 7:53 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; 'Christy_Franklyn@schirmereng.com'; Whatley, Michael
Subject: RE: H2S Contingency Plan

Carl. Attached is Navajo's proposal for your consideration. Included in the proposal is our worst case release scenario. After your review and comments, Navajo will prepare the H2S Contingency Plan for submittal to the agency and Emergency Response organizations.

Johnny Lackey

Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, February 05, 2010 1:48 PM
To: Lackey, Johnny
Subject: H2S Contingency Plan

Johnny:

Hi. I have not received Navajo Refining Company's proposal that you indicated during our last meeting related to the above subject.

One recommendation that I have based on our meeting and Navajo Refining Company's concern about the ROE is attempt to provide an illustration of a real worse case scenario based on refinery controls and operations, but explain and reference in appendices the scenario that complies with OCD regulations. In this way, you can present your real worse case and address OCD regulation in the contingency plan.

Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

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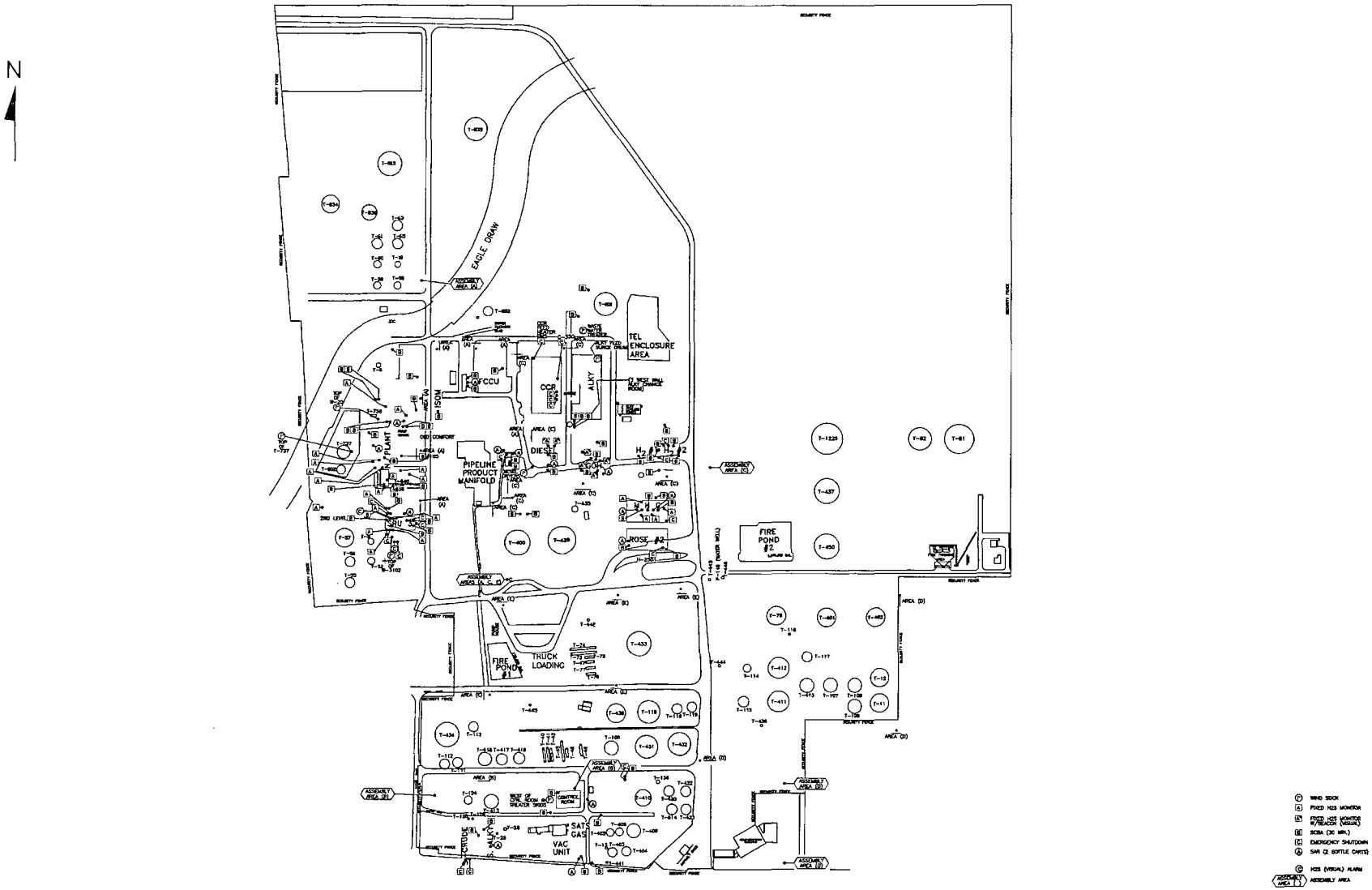


NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK	DATE	APPR	APPR
A	REVIEW AND COMMENT	YSF		3/30/10		

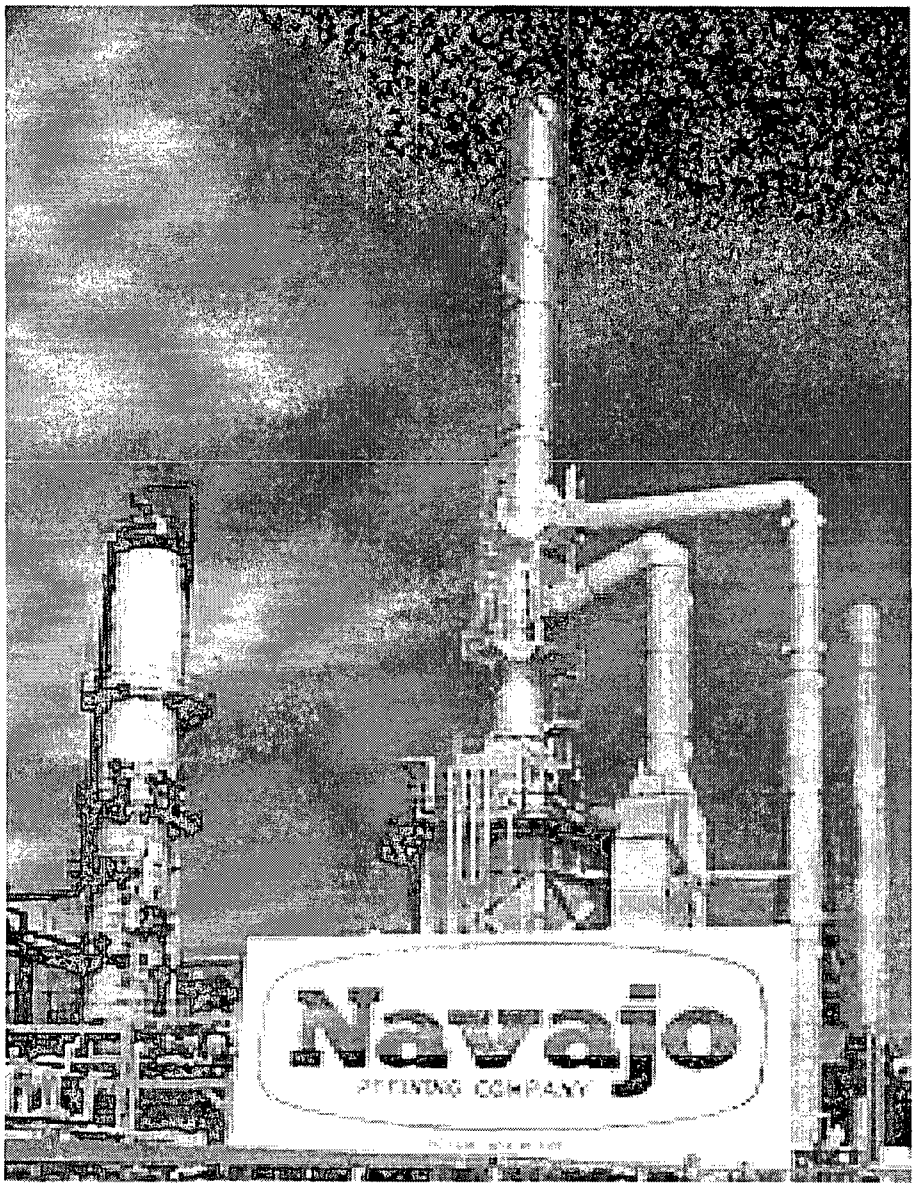
DRAWING TITLE

H2S CONTINGENCY PLAN
NAVAJO
REFINING COMPANY
ARTESIA, NEW MEXICO

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	DATE BY	SCALE
GM		1"=185'-0"
DATE	APP. BY	DRAWING NUMBER / REV.
3-3-92		55-Z-55-0-01 / A

Navajo Refining Company
Artesia, NM



H2S Contingency Plan

Navajo Refining Company

Artesia Refinery

Artesia, New Mexico

March 2010

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H_2S CONTINGENCY REPORT
ARTESIA REFINERY
NAVAJO REFINING

- *INTRODUCTION*

The facility is a petroleum refinery which processes crude oil into asphalt, diesel fuel, naphtha, gasoline, kerosene, and liquefied petroleum gas (LPG). This facility:

- Processes crude at a combined rate of 100,000 barrels per day (bbls/day)
- Receives ~ 40,000 bbls/day of this volume from the Lovington Refinery
- Has an approximate total storage capacity of 1,256,902 barrels (bbls)
- Has an average storage volume of 500,000 to 750,000 bbls

Loading/unloading operations are conducted on a 24 hour, seven (7) day per week basis. The operations are listed in Table 1.

Table 1. Loading and Unloading Operations

Truck Loading	Truck Unloading	Rail Car Loading	Rail Car Unloading
Asphalt	Asphalt	Asphalt	LPG
Carbon Black Oil	Gas Oil	Carbon Black Oil	
Diesel Fuel/Gasoline	Crude Oil	Diesel Fuel	
LPG	Bulk Chemicals	Slurry	

1.1 Plant Description and Map

The Navajo Refinery is located in Artesia, Eddy County, New Mexico. It is owned and operated by Navajo Refining Company, a wholly owned subsidiary of Holly Corporation. Table 2 provides details on Navajo Refinery's location.

Table 2. Navajo Refinery Location

Physical Address:	501 E. Main Street, Artesia, NM 88211-0159
Mailing Address:	P.O. Box 159, Artesia, NM 88211-0159
Latitude:	32.842
Longitude:	-104.391

The location of the Navajo Refinery is illustrated in Figure 1.

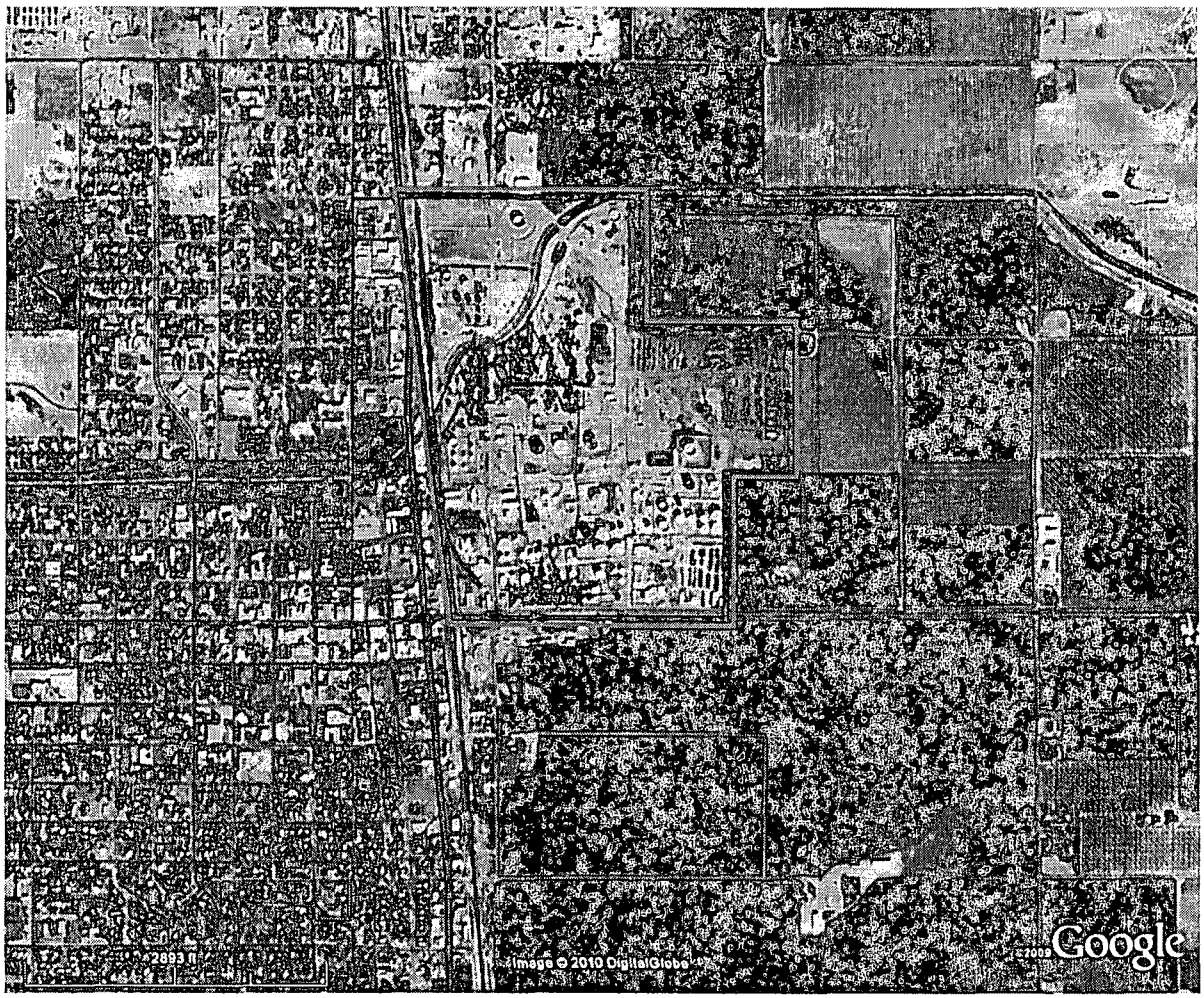


Figure 1. Location of Navajo Refinery (Approximate Boundaries)

1.2 Description of Operations

The Navajo Artesia refinery processes crude oil as well as intermediates received from outside sources such as Navajo's Lovington, NM refinery and other third-party sources. Crude oil and intermediates are purchased as needed or as justified on an economic basis. The crude oil and other intermediates enter the Artesia refinery via pipeline, truck, or rail. The Artesia refinery produces butane, propane, liquefied petroleum gas (LPG), jet fuels, kerosenes, diesel fuels, various grades of gasoline, carbon black oil (CBO), gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia refinery produces refinery fuel gas, hydrogen, nitrogen, and steam. The combined facility charge capacity is approximately 100,000 bbl/ day.

Process units at the refinery include:

- Alkylation Unit
- Amine Unit
- Atmospheric Crude Distillation Units
- Boilers
- CCR Reformer
- Cooling Towers
- Crude Oil Receiving and Storage
- Diesel Hydrotreating Unit
- Flares
- Flasher/Vacuum Distillation Unit
- Fluid Catalytic Cracking Unit
- Gas Oil Hydrotreating Unit
- Hydrocracking Unit
- Hydrogen Production Units
- Isomerization (or Penex) Unit
- Kerosene Hydrotreating Unit
- LPG Pressure Tanks
- MEROX®/Merichem Treaters
- Naphtha Hydrotreating Units
- PBC Butane Splitter Unit
- Saturates Gas Plants
- Solvent De-Asphalting Unit (ROSE Unit)
- Sour Water Strippers
- Storage Tanks
- Sulfur Recovery Units
- Utility and Vessels
- Wastewater Collection and Treatment System

H_2S is produced by processing (primarily by hydrogen de-sulfurization) products distilled from crude oil, naphtha, kerosene, diesel, and gas oils at the Artesia Refinery. Small amounts of H_2S are present in crude oil and are recovered during distillation into fuel gas. Sour gas streams produced by processing and sour fuel gas from the crude unit are contacted with amine to recover H_2S from sour gas streams. The amine solution that absorbs the H_2S is circulated to a steam re-boiled Stripping Tower to regenerate the amine for re-use in contacting sour gas. The off-gas from the Amine Stripping Tower is sent to a Sulfur Recovery Unit (SRU) to convert the H_2S into elemental sulfur.

The Sulfur Recovery Units have the highest concentration of H_2S.

1.3 Sulfur Recovery Units (SRUs)

The Artesia Refinery currently uses two, three-stage Claus sulfur recovery units (SRU1 and SRU2), a common tail gas treatment unit (TGTU), and a common tail gas incinerator (TGI). Navajo also has an additional sulfur recovery unit (SRU3). The new SRU has its own TGTU (TGTU3) and its own TGI (TGI3).

The sulfur recovery process significantly reduces air pollution and generates steam for refinery consumption.

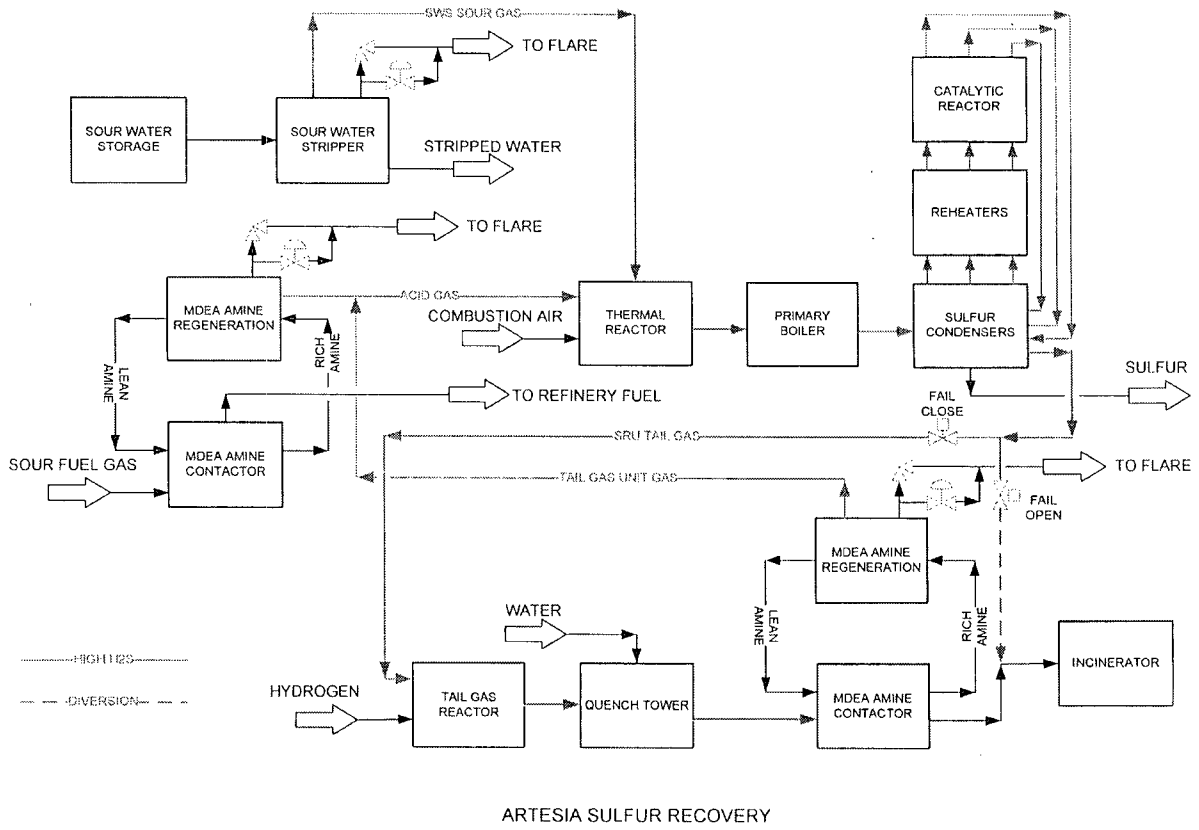
A Claus sulfur recovery unit converts H_2S to elemental sulfur by first oxidizing one-third of the H_2S to SO_2 to form elemental sulfur.

The acid gas first passes through knockout drums designed to remove entrained sour water and condensed hydrocarbons from the amine acid gas and the sour water stripper gas. The gases are then fed to a thermal reactor. Heat for the reactor is provided by the combustion of the acid gas.

Tail gas containing unrecovered sulfur compounds flows from the SRU to the TGTU where the sulfur compounds pass through a reactor converting the sulfur compounds into the H_2S. The reactor effluent then flows into a vessel for contact with lean (low sulfur) amine solution. The H_2S is absorbed by the amine while the treated tail gas flows to the TGI for combustion. The rich (high sulfur) amine solution then flows from the contactor to a stripper column, which regenerates, lean amine from rich amine by removing the H_2S. The concentrated H_2S gas stream produced by the stripper is recycled to the SRU. The regenerated lean amine is pumped back to the contactor for reuse.

The TGI will receive any remaining gases from the TGTU, as well as the vent stream from the sulfur pit. The TGI will further reduce H_2S emissions by combusting the H_2S to SO_2. Continuous emissions monitor systems (CEMS) will continuously measure and record sulfur dioxide (SO_2) concentrations in each TGI stack.

The sulfur recovery process is illustrated in Figure 2.



ARTESIA SULFUR RECOVERY

Figure 2. Navajo Artesia Refinery Sulfur Recovery Flow Diagram

- *THE H_2S CONTINGENCY PLAN*

1.4 Responsibility for Conformance with the H_2S Contingency Plan

It is the responsibility of all personnel onsite to follow the safety and emergency procedures outlined in the H_2S Contingency Plan, as well as the following documents:

- Navajo Refining Safety and Health Manual
- Navajo Refining Integrated Contingency Plan
- Navajo Refining Environmental Policies and Procedures
- Navajo Refining Operating Procedures

1.5 Revisions to the H_2S Contingency Plan

The H_2S Contingency Plan will be reviewed annually and revised as necessary to address changes to the facility, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected, especially those areas within the radii-of-exposure.

1.6 Availability of the H_2S Contingency Plan

The H_2S Contingency Plan will be available to all personnel responsible for implementation of the plan. A copy of the H_2S Contingency Plan will be available on the Holly Corp intranet site (Flashpoint) and hard copies will be available in the Safety, Environmental, Plant Manager, Operations Manager, Maintenance, PSM offices and in each plant control room. See Appendix H for the H_2S Contingency Plan Distribution List.

1.7 Content of the H_2S Contingency Plan

As a minimum, the H_2S Contingency Plan will contain:

- The characteristics of H_2S
- A facility description, map and/or drawings
- Emergency procedures to be followed in the event of a release of H_2S
- Information regarding training and drills to be conducted related to the H_2S Contingency Plan

- *H_2S CONTINGENCY PLAN DESIGN CONSIDERATIONS*

1.8 Definitions

Immediately Dangerous to Life and Health (IDLH) - The atmospheric concentration of a toxic, corrosive or asphyxiant substance that creates an immediate threat to life or could cause irreversible or delayed adverse health effects, or could interfere with an individual's ability to escape from a dangerous atmosphere.

Parts per million (ppm) - A unit of measure, one equal part of a substance per one million equal parts of air.

Permissible Exposure Limit (PEL) - The employee's 8-hour time weighted average which shall not be exceeded at any time during a work day.

Short Term Exposure Level (STEL) - is the employee's 15-minute time weighted average, which shall not be exceeded at any time during a work day unless another time limit is specified.

Time Weighted Average (TWA) - The employee's average airborne exposure in an 8-hour work shift of a 40-hour work week, which shall not be exceeded.

1.9 General Information

Hydrogen sulfide is a highly toxic, colorless and flammable gas which burns with a blue flame. When burned it produces SO2 or sulfur dioxide which is also a poisonous gas. It is slightly heavier than air, and is usually associated with the smell of rotten eggs. This strong and distinctive odor is evident at concentrations as little as 1 ppm. At high concentrations, the olfactory nerves become fatigued and paralyzed; therefore, the sense of smell shall never be used as the sole detector of H_2S. Respiratory protection guidelines must be stringently followed because inhalation is the primary route of exposure.

Generally, H_2S can be found in all plant areas that contain crude oil, refinery fuel gas, sour water or unit areas which remove and process H_2S and/or sulfur. H_2S containing process piping and equipment may be identified by H_2S warning signs. However, due to the close proximity of operating units and nature of the refining process, warning signs are not intended to indicate every potential H_2S area.

All personnel entering H_2S areas shall visually locate wind socks and note wind direction. If expected to do anything except evacuate immediately upon the onset of an alarm, they shall identify the location and be trained to use 30-minute SCBAs. Fresh air equipment shall be used for initial opening of H_2S containing process equipment and/or piping. Be aware that there may be additional requirements for work in some areas in the facility, or for special work. Hot Work Permits and Confined Space Entry Permits are examples of such circumstances.

1.10 Hydrogen Sulfide

Hydrogen sulfide properties and characteristics are described in Table 3.

Table 3. H_2S Properties and Characteristics

CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Auto ignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues and nerves

1.10.1 H_2S Exposure Limits and Effects of Exposure

H_2S exposure limits and effects of exposure are described in Table 4and Table 5.

Table 4. H_2S Exposure Limits

PEL	10 ppm
STEL	15 ppm
IDLH	100 ppm

Table 5. H_2S Affects of Exposure

Concentration	Effect
0.05 ppm	Rotten egg odor, detectable by most people.
0.13 - 30 ppm	Obvious and unpleasant odor.
50 - 150 ppm	Olfactory fatigue (temporary loss of smell) and marked dryness and irritation of the nose, throat and respiratory tract. Prolonged exposure may cause runny nose, cough, hoarseness, headache, nausea, shortness of breath, and severe lung damage (pulmonary edema).
200 - 250 ppm	Worsening and more rapid onset of the above health effects; possible death in 4 to 9 hours.
300 - 500 ppm	Excitement, severe headache and dizziness, staggering, loss of consciousness, respiratory failure likely in 5 minutes to an hour. Possible death in 30 minutes to 4 hours.
500+ ppm	Rapid onset of severe toxicity, respiratory paralysis, and death. If not fatal, may cause long-term effects such as memory loss, paralysis of facial muscles or nerve tissue damage.
800 - 1000 ppm	May be immediately fatal after one or more breaths, resulting in an instant unconsciousness or "knock-down" effect.

1.10.2 Personal Protective Equipment

Approved respiratory protection for H_2S at the Navajo Refinery shall consist of the following:

- 30-minute SCBA (self-contained breathing apparatus)
- Supplied air-line respirator with 5 minute egress cylinder

1.10.3 Respiratory Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentrations of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

1.11 RADII of Exposure (ROE)

RRS/Schirmer evaluated the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas for the worst case release scenario (as described in Appendix A) of H_2S gas for Navajo refinery. The 100-ppm and 500-ppm ROE were calculated in compliance with API RP-55 and are shown in Table 6. The details of calculations, equations and other variables used to evaluate the ROE are discussed in Appendix B-Calculation for Radius of Exposure. A map showing 100-ppm and 500-ppm contours are contained in Appendix C.

Table 6. Radius of Exposure

Concentration of H_2S (ppm)	Distance (feet)
100	1505
500	771

- *EMERGENCY ACTION PROCEDURES*

1.12 Emergency Response Organization

Navajo Refining Company utilizes the Incident Command System (ICS) to manage emergency response activities. The ICS is a management tool which is readily adaptable to very small incidents as well as those of considerable significance. The ICS shall be implemented for all discharge incidents with staffing levels adjusted as required to meet the specific needs (size and severity of the incident. Response to a discharge originating from the Facility will be provided by the Emergency Response Team.

1.12.1 Qualified Individual

Vital duties of the Qualified Individual (QI) include:

- Activate internal alarms and hazard communication systems to notify all Facility personnel.
- Notify all response personnel, as needed.
- Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification.
- Notify and provide necessary information to the appropriate Federal, State, and Local authorities with designated response roles, including the National Response Center (NRC), State Emergency Response Commission (SERC), and local response agencies.
- Assess the interaction of the spilled substance with water and/or other substances stored at the Facility and notify response personnel at the scene of that assessment.
- Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion).
- Assess and implement prompt removal actions to contain and remove the substance released.
- Coordinate rescue and response actions as previously arranged with all response personnel. Use authority to immediately access company funding to initiate clean-up activities.
- Direct clean-up activities until properly relieved of this responsibility.

The Refinery Vice President/Manager serves as Qualified Individual (QI) and the Operations Manager serves as the Alternate Qualified Individual (AQI). Arrangements are made to ensure that either one or the other is available on a 24-hour basis and is able to arrive at the Facility in a reasonable time. The AQI shall replace the QI in the event of his absence and have the same responsibilities and authority.

1.12.2 Emergency Response Team

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by qualified management personnel.

The number of positions/personnel required to staff the Emergency Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the IC directly or delegated as the situation demands.

The IC is always responsible for directing the response activities and will assume the duties of all the primary positions until the duties can be delegated to other qualified personnel.

The Emergency Response Team is shown on the organization chart in Figure 3.

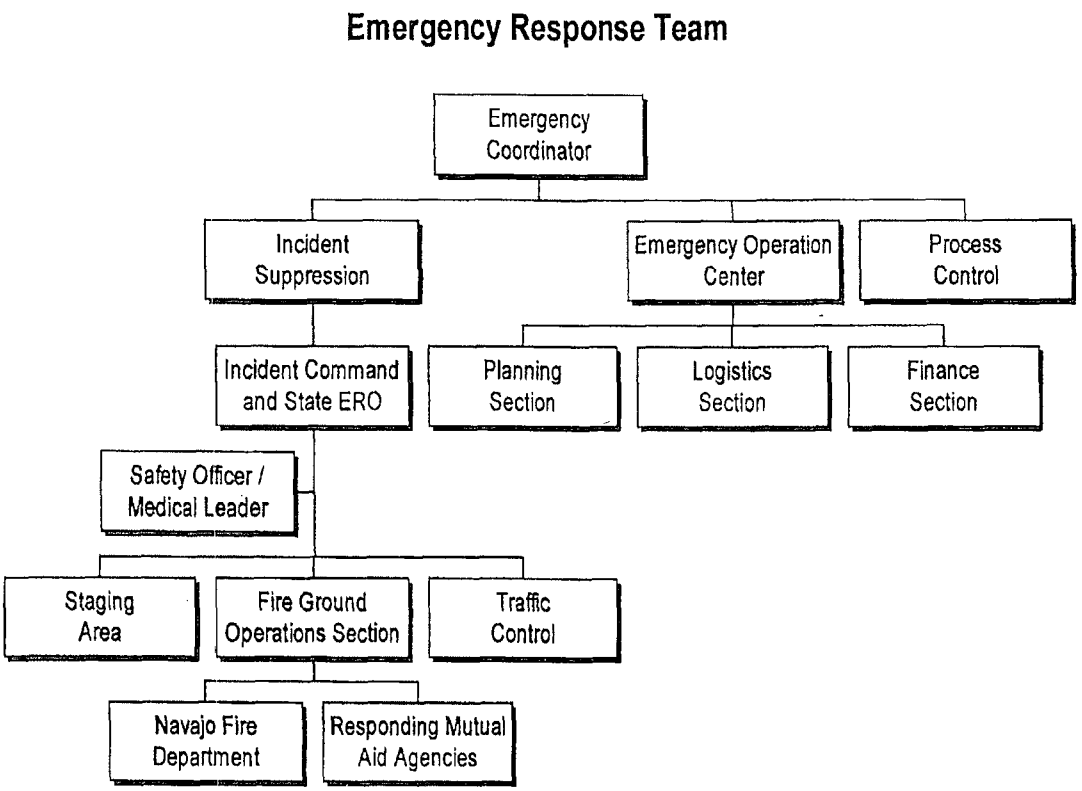


Figure 3. Emergency Response Team

1.13 Emergency Response

1.13.1 Objective

This section explains the procedures and decision process to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1.13.2 Plant Evacuation and Emergency Assembly Areas

Appendix D contains a plot plan of the Plant Evacuation and Emergency Assembly Areas.

1.13.3 Immediate Action Plan

Facility employees, contractors, and visitors are expected to attend the facility's training program. During this program, potential hazardous areas are identified to the trainee and proper procedures to follow if an incident occurs are discussed. All onsite personnel including employees, contractors, and visitors are expected to report any emergency situation, including a release of H_2S, by:

- Immediately notifying Central Dispatch by:
  - Activating the Emergency Alarm System
  - Announce twice over the operating channel for that location "(type of emergency) at (location)"
  - Once the alarm is received, the alarm point will be contacted by Central Dispatch to verify the problem and gather any additional information about the situation. The person responsible for sounding the alarm should use this opportunity to tell Central Dispatch where the emergency is and the nature of the emergency (i.e., fire, spill, H_2S release)
  - After verifying the alarm, Central Dispatch will follow the appropriate procedure based on information received during the alarm verification

1.13.3.1 Initial Response Actions

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Emergency Response Team is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation. Response actions contained in Appendix F.

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident. **Without exception, personnel and public safety is first priority.**

The first Navajo Refining Company person on scene will function as the person-in-charge until relieved by an authorized supervisor who will assume the position of Incident Commander (IC). Transfer of command will take place as more senior management respond to the incident. For response operations within the control of the Emergency Response Team, the role of IC will typically be assumed and retained by the Manager, Safety and Risk Management.

The person functioning as IC during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

For the purpose of implementation, a distinction is made between spills that are contained on refinery property as opposed to spills that leave or have the potential to leave refinery property. In the latter case, the threat of environmental harm to the public and the waters of the United States are much greater. In addition, the agency reporting requirements and the response personnel and equipment requirements vary depending on the scenario.

The potential for a spill to migrate out from refinery property is reduced since the Artesia refinery provides secondary containment protection through a process wastewater collection system from each process unit and loading area, secondary containment dikes around the bulk storage tanks. -Based on the site topography, spills or releases from the site flow northeast and the northeastern perimeter earthen bank is approximately eight feet high. These structures in conjunction with the diversion swale along the south face of Eagle Draw, flat slopes on-site, and a desert environment combine to effectively contain most spills on facility property. However, in the unlikely event that discharges escape the confines of the facility, emergency procedures have been established.

1.13.3.2 Initial Response Documentation

It is difficult, particularly during the first few minutes of an initial response operation to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response.

When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate
- Do not criticize the efforts and/or methods of other people/operations
- Do not speculate on the cause of the spill
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change
- Record the recommendations, instructions, and actions taken by government/regulatory officials
- Document conversations (telephone or in person) with government/regulatory officials

- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions)

1.13.4 Emergency Shutdown System

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums
- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

1.13.5 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO2.

Acid gas flaring will be initiated when the SRUs are unable to treat acid gas. The Amine Regeneration (Steam Reboiled Strippers) is equipped with a pressure control valve with a set-point higher than normal operating pressure of the stripper. With the acid gas blocked during a SRU trip, the pressure on the Stripper will increase until the pressure control valve set-point to flare is exceeded. The Stripper will then begin to send acid gas to the flare to maintain the pressure of the Stripper. Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined.

1.13.6 Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H_2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H_2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H_2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H_2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

1.13.7 Fixed H_2S Detection Systems

Local H_2S detectors are installed at all locations where H_2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at concentrations higher than 10 ppm. A remote alarm is initiated in the control room along with local beacons and alarms located in the unit.

1.13.8 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

1.13.9 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

1.13.9.1 Notifications and Reports

The Navajo Refinery has various notification and reporting obligations. Some are related to its state air quality permit, as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, refinery personnel also have internal and external notification and reporting obligations associated with the activation of this H_2S Contingency Plan. Internal notifications should be made for each emergency incident to the extent that the incident demands as described on the checklists provided as **Table 4**.

1.13.9.2 Discovery and Internal Reporting

All refinery personnel who perform maintenance and/or repair work within the refinery wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn within the breathing zone. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the refinery personnel shall notify the Shift Foreman, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation.
- Type and severity of the emergency.
- Location of the emergency (Process Unit, storage tank number, loading rack location or building), and the distance to surrounding equipment and/or structures.
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
- Description of injuries and report of damage to property and structures.
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
- If the Plant personnel detects H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Safety Manager, Plant Manager or their designee so that the IC system can be implemented and H_2S Plan activated if necessary.

- Once the Safety Manager is contacted, he or his designee is to notify the appropriate refinery management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. refinery management will then conduct further reporting that is necessary based on the situation.
- Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

1.13.9.3 External Notification

The following guidelines should be remembered when reporting spills:

- Never include information that has not been verified
- Never speculate as to the cause of an incident or make any acknowledgement of liability
- Document:
  - Agency Notified
  - Date/Time of Notification
  - Person Notified
  - Content of Message Given
- DO NOT DELAY reporting due to incomplete information

Appendix G contains the Emergency Call List.

1.13.9.4 Site Security

The security measures in place for the Facility perimeter include fences and gates as follows:

- The refinery property is fully fenced and monitored by contract security guards 24 hours per day, 7 days per week.
- All plant entrances have automatic gates or are staffed with guards 24 hours per day.
- The Facility is manned by operating personnel 24 hours per day, 7 days per week.

1.13.9.5 Sign and Markers

The refinery has warning signs indicating the presence of H_2S at the entrance to the refinery. Signs are located at the plant entrances indicating that all visitors are to proceed to the main gate located at Freeman and Richey Streets to sign-in.

1.13.9.6 First-Aid Station

The first aid station will be located at the Emergency Assembly Area. First aid kits are located:

- All main office buildings
- Fire Station
- Warehouses
- Control Rooms

1.13.9.7 Media Site

If the H2S Contingency Plan is activated, the Media Site will be located at the Artesia Chamber of Commerce Conference Room.

At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

1.13.9.8 Emergency and Safety Equipment

There are 4 emergency response trailers at the Artesia Refinery. Three trailers are located at Holly Energy Partners office east of the refinery and one trailer is maintained inside the refinery boundary fence. A complete listing of the emergency response equipment is provided in **Appendix E**.

- ***TRAINING AND DRILLS***

1.14 All Employees

All Navajo Refining employees and contractor employees shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas
- The person(s) are working in a plant area which contains no possible H_2S exposures

Training information and documentation will be maintained by the Safety Department.

1.15 Response Team Training

Navajo has designated a Safety Training Coordinator in light of the significant training and record keeping requirements by the many different government agencies (i.e., DOT, OSHA, EPA and various state and local agencies). The training coordinator's duties include conducting, training and maintaining records for all employees which documents the content of and the applicable regulatory requirement for the training. In addition to training records, the coordinator also maintains records of safety meetings and other meetings related to environmental regulations.

All employees who work in operating areas of the refinery or have the potential to be exposed to the operating areas receive an initial 40 hours of comprehensive training emphasizing occupational safety, environmental compliance and process safety management. Employees receive 40-hour training at their initial employment and annual computer based training (CBT) refresher training thereafter to comply with requirements found in:

- 40 CFR 112.7(e) - SPCC Plan
- 40 CFR 112.21 - Facility Response Plan
- 40 CFR 262 - Hazardous Waste Contingency Plan

Common elements of all three of these programs include prevention, detection, and response to releases of oils and other hazardous materials. Training common to all three also includes emphasis on good housekeeping practices (Best Management Practices), secondary containment, and prompt initial notification of an incident.

1.15.1 Response Team Exercises

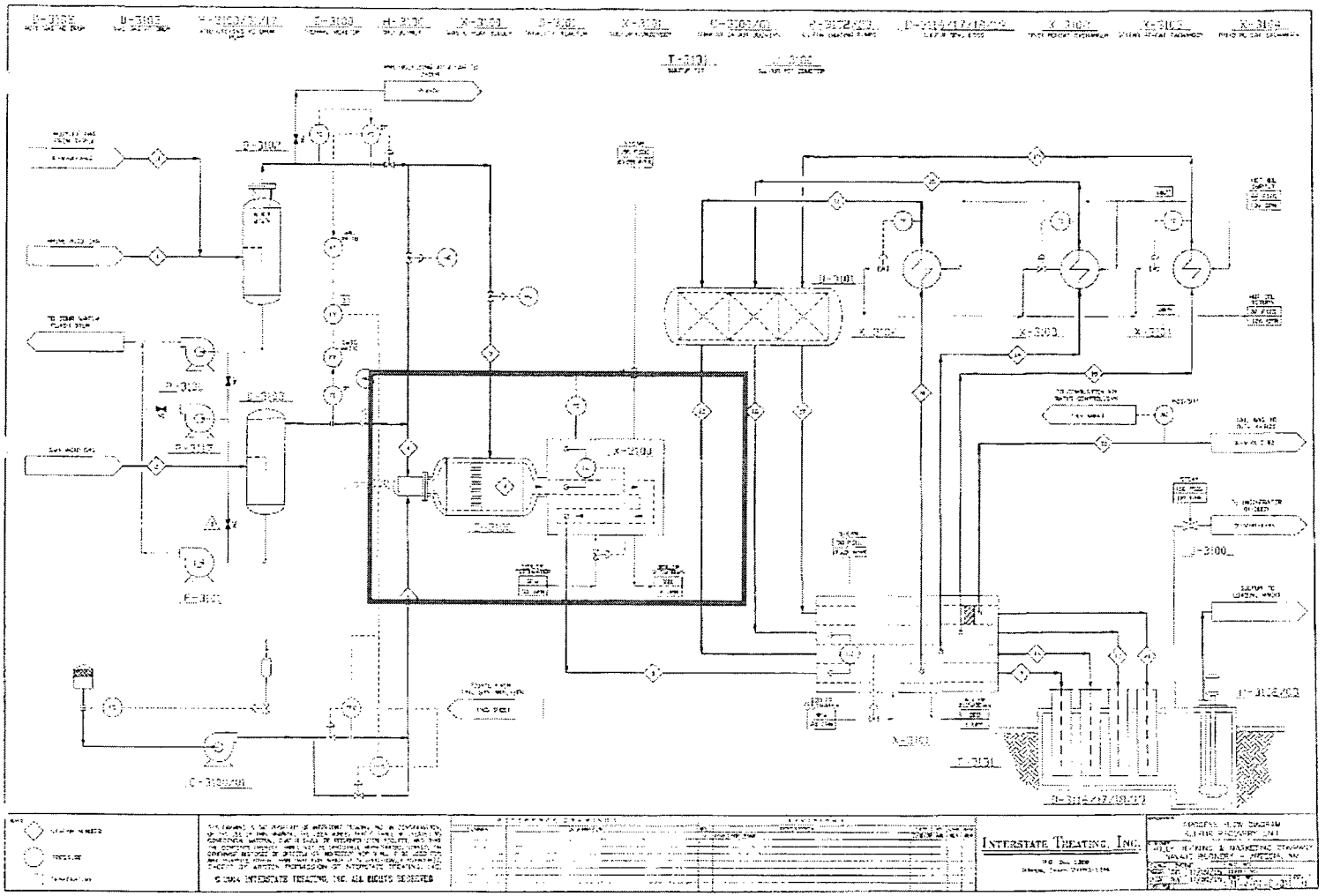
Emergency Response Team members, various agencies, contractors and other response resources will participate in emergency response exercises as required by federal, state, and local regulations and as detailed in the "National Preparedness for Response Exercise Program" (PREP). Navajo Refining Company will utilize announced and unannounced notification exercises, equipment deployment exercises, tabletop exercises, and/or various combinations to ensure that each component of the Plan is exercised as required. Exercises include:

- Annual Qualified Individual Notification Exercises
- Annual Equipment Deployment Exercise
- Annual Response Team Tabletop Exercise

APPENDIX A

WORST CASE SCENARIO FOR H_2S RELEASE

The worst case release scenario of H_2S gas was described by Navajo refining personnel to be the instantaneous release of contents of the thermal reactor (D-3100) located in Unit # 31 Sulfur Recovery Unit. The thermal reactor is shown in a red box in the PFD below.



APPENDIX B

CALCULATION FOR RADIUS OF EXPOSURE

To estimate the radius of exposure associated with an instantaneous release of H_2S due to the catastrophic rupture of a vessel, a calculation procedure from API RP-55, *Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide,* was adopted. The equation for predicting ROE for H_2S releases was taken from pg. 36 of Appendix C of API RP 55:

$$ROE = 10^{\left[A \times \log(H_2S) + B\right]} \quad \text{.....Equation 1}$$

Where ROE is H_2S radius of exposure, A and B coefficients contained in Table C-1 of API RP 55 (reprinted below), and $[H_2S]$ is the amount of H_2S released. For continuous release, the H_2S release rate in entered in standard cubic feet per hour (SCFH) and for a puff (instantaneous) release the quantity of H_2S is entered in standard cubic feet (SCF).

Table C-1—Linear Regression Coefficients for Mathematical Predictions of ROE as a Function of Downwind Hydrogen Sulfide Concentration and Release Quantity/Rate

Time*	Type of Release	Concentration, ppm	Coefficients A	Coefficients B
Day	Continuous	10	0.61	0.84
Day	Continuous	30	0.62	0.59
Day	Continuous	100	0.58	0.45
Day	Continuous	300	0.64	-0.08
Day	Continuous	500	0.64	-0.23
Night	Continuous	10	0.68	1.22
Night	Continuous	30	0.67	1.02
Night	Continuous	100	0.66	0.69
Night	Continuous	300	0.65	0.46
Night	Continuous	500	0.64	0.32
Day	Puff	10	0.39	2.23
Day	Puff	30	0.39	2.10
Day	Puff	100	0.39	1.91
Day	Puff	300	0.39	1.70
Day	Puff	500	0.40	1.61
Night	Puff	10	0.39	2.77
Night	Puff	30	0.39	2.60
Night	Puff	100	0.40	2.40
Night	Puff	300	0.40	2.20
Night	Puff	500	0.41	2.09

*Day Meteorological Conditions: Stability Class PG D (Neutral)—5 mph Wind Speed.
*Night Meteorological Conditions: Stability Class PG F (Stable)—2.2 mph Wind Speed.

According to the information supplied by Navajo refining personnel, the thermal reactor and the associated piping contains a total volume of 5,800 cubic feet. The composition of the stream exiting that vessel from the heat and material balance sheets is as shown below:

Component	Composition (lb moles/hr)	Composition Mole %
Nitrogen	766	56
Hydrogen	13	1
Carbon monoxide	3	0.2
Carbon dioxide	7	0.5
Water	364	26
Sulfur dioxide	40	3
Hydrogen sulfide	80	6
Carbon disulfide	0.15	<0.1
Carbonyl sulfide	0.44	<0.1
Sulfur dimer	106	8
Total	1,380	100

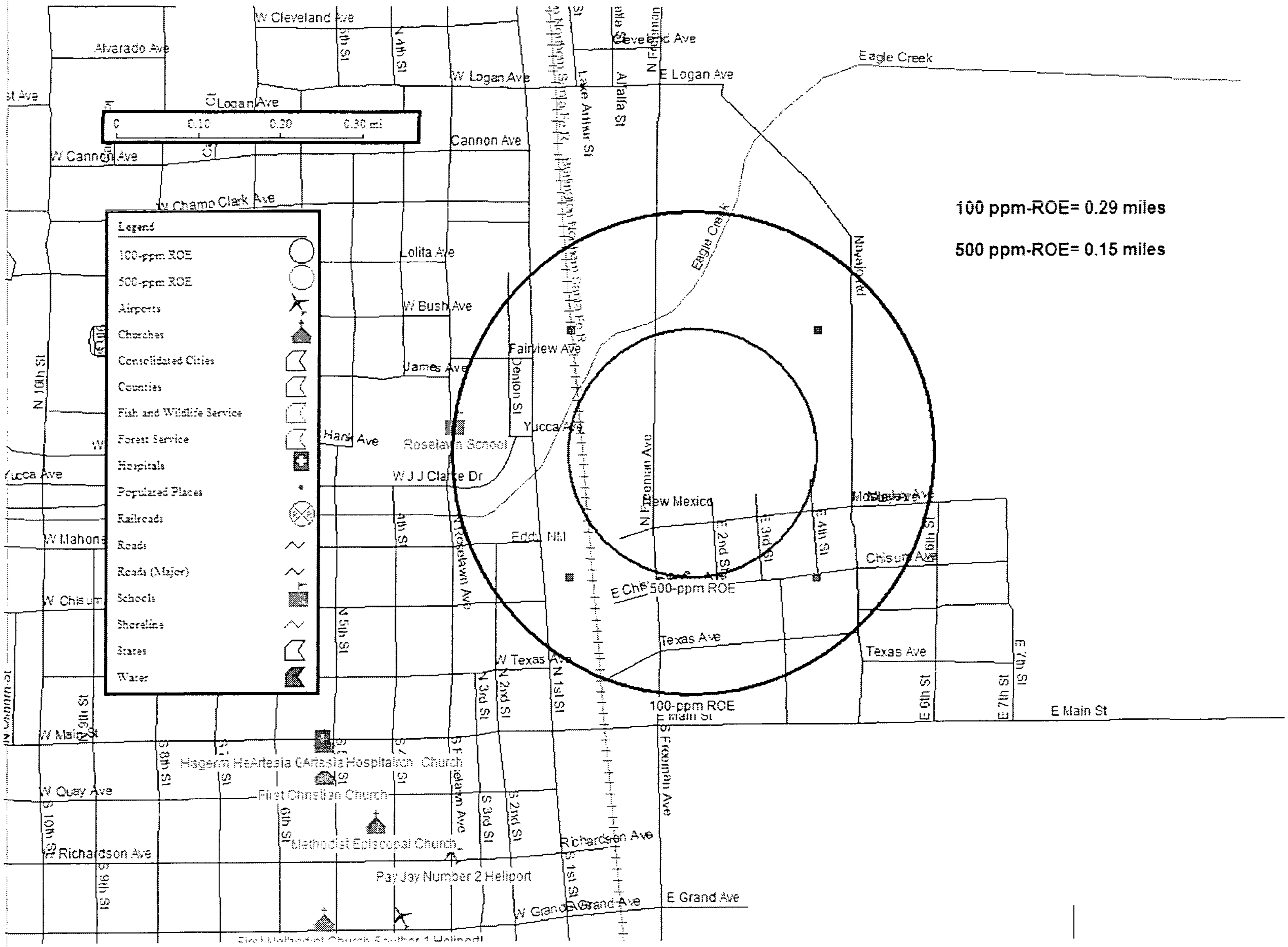
This stream was reported to be at a pressure of 20.6 psia and a temperature of 2416 degrees Fahrenheit. The composition of H_2S in the exiting stream is 6% by mole or volume fraction. Therefore, the maximum gaseous volume of H_2S in the vessel would be 6% of 5,800 cubic feet which is 348 cubic feet. At standard conditions of 14.73 psia and 60 degrees Fahrenheit, that volume would be equivalent to 88 SCF of H_2S. The coefficients A and B were taken from Table C-1 for night time conditions (to ensure the most conservative results), for puff releases (due to the instantaneous rupture scenario), and for 100 ppm and 500 ppm concentrations of interest. Radii of exposure for those two concentrations were calculated, as follows.

$$ROE - 100\,ppm = 10^{\left[0.40 \times \log(88) + 2.40\right]} = 1{,}505\,feet$$

$$ROE - 500\,ppm = 10^{\left[0.41 \times \log(88) + 2.09\right]} = 771\,feet$$

APPENDIX C

RADIUS OF EXPOSURE (ROE) MAP


100 ppm-ROE= 0.29 miles
500 ppm-ROE= 0.15 miles
Legend
100-ppm ROE
500-ppm ROE
Airports
Churches
Consolidated Cities
Counties
Fish and Wildlife Service
Forest Service
Hospitals
Populated Places
Railroads
Roads
Roads (Major)
Schools
Shoreline
States
Water
0
0.10
0.20
0.30 mi
Eagle Creek
Navajo Rd
E Logan Ave
W Logan Ave
Cannon Ave
Lake Arthur St
Alfalfa St
Lolita Ave
W Bush Ave
James Ave
Fairview Ave
Denton St
Yucca Ave
Roselawn School
W J J Clarke Dr
New Mexico
N Freeman Ave
E 2nd St
E 3rd St
E 4th St
E 6th St
E 7th St
E Main St
Texas Ave
Chisum Ave
500-ppm ROE
100-ppm ROE
W Texas Ave
N 1st St
N 2nd St
N 3rd St
E Grand Ave
W Grand Ave
Richardson Ave
Pay Jay Number 2 Heliport
Methodist Episcopal Church
First Christian Church
W Cleveland Ave
Alvarado Ave
W Cannon Ave
W Champ Clark Ave
N 10th St
N 5th St
N 4th St
W Quay Ave
W Richardson Ave
S 8th St
S 9th St
S 10th St
W Chisum
W Mahone
Hank Ave
Eddy NM

APPENDIX D

PLANT DIAGRAM - EVACUATION ROUTES, H_2S MONITORING AND ALARM LOCATIONS

See email attached file:

Navajo H2S CP Plot Plan.pdf

(A hard copy of the Contingency Plan is being sent via FedEx with full size plot plan)

APPENDIX E

DESCRIPTION OF EMERGENCY RESPONSE EQUIPMENT

1. Portable Pumps — Location
   1. Blue Diesel Pump — Waste Water Treatment Plant
   2. New Portable Pump — North of Main Warehouse
   3. Red Gasoline Driven Pump — Tanks 437 & 439

2. Booms
   1. Spill Kit (see item no. 6) — Warehouse #4

3. Absorbents
   1. Spill Kit — Warehouse #4
   2. Sphag-Sorb Pillows — Warehouse #4
   3. Bail of Peat Moss — Warehouse #4

4. Hand Tools (Insert Copy of Tool list from MHM)

5. Fire Fighting & Personnel Protective Equipment - Operational Status: Good

Type & Year	Quantity	Storage Location
1980 Ford Mini Pumper w/125 GPM Scat Fire Apparatus Pump 50 gal. Foam Tank	1	Fire Station
1986 National Foam Pumper w/1250 GPM pump 500 GPM Deck Gun, 1000 gal. Foam Tank	1	Fire Station
Foam Trailer 1650 Gal.	1	Fire Station
National Foam 660 GPM Foam Tower	2	Fire Station
Portable Monitors	13	Fire Station

6. Other (e.g., Heavy Equipment, Boats, & Motors) - Operational Status: Good

Type & Year	Quantity	Storage Location
Front End Loader (1985 John Deere) 300B	1	Crane Shed N. of Main Whse.)
Vacuum Truck (1985 Mack)	1 70 barrel (bbl)	Crane Shed (N. of Main Whse.)
Lugger Bucket Truck	1	Crane Shed (N. of Main Whse.)

7. Communication Equipment - Operational Status: Good

Description	Quantity	Location
Telephones	205+	Throughout Facility
Base Radios	6	Throughout Facility
Portable Radios	56	Throughout Facility
Mobile Radios	22	Throughout Facility
Remote Radios	12	Throughout Facility
Pagers	19	Throughout Facility
Cellular Phones	11	Throughout Facility

8. Cellular phones

Cellular Phones Assigned To	Phone No.
Safety & Risk Manager (Bill Jones)	575-748-6779
Sr. Engineer Mgr (Jimmy Meeks)	575-308-8718
Sr. Maintenance Mgr (David Bolding)	575-365-2694
Sr. Operations Mgr (Ricky Swafford)	575-365-7873
Product Movement & Lab Mgr (David Latham)	575-746-5277
Refinery Mgr (Michael Whatley)	575-513-2276
Inspection Mgr (Jeff Beauregard)	575-365-4237
Sr. Environmental Mgr (Johnny Lackey)	972-261-8075

9. Emergency Response Trailer

5 packages of Hot Hog boom 3" X 10'

2 shovels

1 rake

1 push broom

1 pry bar

¾ cu ft of sphag sorb

1 box of nitrile gloves

6 pair rubber boots various sizes

8 pair of goggles

1 box of ear plugs

1 folding ladder

6 slicker suits

2 portable lights

2 extension cords

2 – 4 inch tie down straps

2 – Full body harnesses

Several pair of cloth gloves

Several pair of rubber gloves

5 folding chairs

1 large water gel blanket

1 generator

2 rescue blankets

Caution tape

1 roll of black plastic

Various hand tools

Air drill

Sash cord

1 decontamination sprayer

Scrub brushes

Gas can

APPENDIX F

H_2S CONTINGENCY PLAN - RESPONSE

H2S Protection Protocols

Less than the PEL - In concentrations of H_2S below the PEL (10 ppm), no respiratory protection is required.

More than the PEL but less than IDLH - In concentrations of H_2S above the PEL (10 ppm), and below the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator or SCBA shall be used.

More than IDLH - In concentrations of H_2S above the IDLH (100 ppm), respiratory protection in the form of a supplied air-line respirator, or SCBA with at least one standby person per affected person shall be used.

Unknown Concentrations of H_2S - For unknown concentration of H_2S, respiratory protection in the form of a supplied air-line respirator or SCBA with standby/rescue person(s) shall be required until the concentration can be measured and is found to be below the PEL.

Rescue of Another Person - For rescue purposes, SCBA or supplied air-line respirator shall be the only form of respiratory protection.

As with other chemical hazards, proper care shall taken to choose proper body, head/face and eye protection as required by the task.

Detection - Personal Monitoring Equipment

Personal H_2S monitors used in the facility should alarm at the PEL (10 ppm) and STEL (15 ppm). Monitors may or may not have direct reading capabilities. Employees should wear a personal H_2S monitor at all times when working in the process units and Blender/Tank Farm locations. The monitors should be worn within the "breathing zone", unobstructed by clothing or equipment and such that the employee can readily perceive the alarms. The breathing zone is a 1.5-foot radius in all directions centered at the nose and mouth.

Alarm protocol

If a personal monitor alarms at the low alarm (PEL), personnel must leave the area and obtain fresh air equipment to complete the work task.

Detection - Fixed Monitoring Equipment

Fixed H2S monitors are located in the refinery in the North Plant and the CCR. The fixed H_2S monitors have two alarm set points. The alarm set points and responses are as follows:

- First set point: 20 ppm
  - Response: Activates alarm in the control rooms
- Second set point: 50 ppm
  - Response: Activates alarm in the control room. Activates strobe lights and an audible alarm in affected unit area(s).

Alarm protocol:

In the event a fixed monitor alarms at the first set point of 20 ppm:

- Operations personnel shall contact and remove any personnel that are not protected with respiratory protection in the affected area(s) under alarm.
- Operations personnel shall contact personnel with proper respiratory protection in the affected area(s) and to ensure that they are aware of the alarm situation.
- Operations personnel may remove any personnel using proper respiratory protection at their discretion.
- Non-operations personnel shall remove themselves from the affected unit area(s). Non-operations personnel can only re-enter an area under alarm with Operations' permission and with proper respiratory protection.

In the event a fixed monitor alarms at the second set point of 50 ppm:

- Operations personnel shall contact and remove all personnel in the affected area(s).
- Non-operations personnel shall remove themselves from the affected unit area(s). **IF FRESH AIR EQUIPMENT IS BEING UTILIZED AT THE TIME OF REMOVAL, IT MUST BE WORN TO EXIT THE AFFECTED AREA(S).**
- Non-operations personnel shall contact Operations after they have exited the affected area(s) under alarm.

Emergency Procedures

All emergency procedures for fire, facility evacuation, earthquake, etc shall be followed as outlined in the **Emergency Response Plan**.

In the event of an H_2S release:

- Wear appropriate respiratory protection if available.
- Make note of wind direction and evacuate upwind or cross wind from the affected area(s).
- Check in with Operations once outside the affected area(s).

First Aid/Rescue Procedures:

- Activate the alarm.
- Never attempt to rescue a downed victim without proper respiratory protection. Proper respiratory protection for rescue purposes is fresh air in the form of a 30-minute SCBA.
- Remove victim to fresh air.
- Check victim for breathing and pulse. If qualified, administer CPR as needed until help arrives.

Information and Training

All NRC employees and contractor employees shall receive H_2S training upon initial orientation into the facility. Refresher training shall be administered on an annual basis, or when changes are made to this program.

Initial training for short-term contract employees and visitors may be waived under the following conditions:

- These person(s) are accompanied by H_2S trained personnel when working in high H_2S areas, or
- The person(s) are given site and job specific instructional training that cover possible H_2S hazards in low H_2S areas, or
- The person(s) are working in a plant area which contains no possible H_2S exposures.

Training information and documentation will be maintained by the Safety Department.

APPENDIX G

EMERGENCY CALL LIST

Navajo Refining Internal Notifications

Internal Notifications				
Organization	**Name**	**Office**	**Home**	**Other**
Emergency Coordinator Refinery VP/Manager (Qualified Individual):	Michael Whatley	(575) 748-3311 ext. 743	(575) 746-2096	(575) 513-2276
Alternate Qualified Individual Manager, Operations	Ricky Swafford	(575) 748-3311 ext. 244	(575) 746-0036	(575) 746-6746
Incident Commander Safety & Risk Manager:	Bill Jones	(575) 748-3311 ext. 779	(281) 217-0897	(575) 308-9503
Fire Chief	King Kelley	(575) 748-3311 ext. 465	(575) 746-0036	Plectron Notification (575) 365-7508
Safety Officer/Medical Officer Safety Department	Kent Bratcher	(575) 748-3311 ext. 410	(575) 746-3268	Plectron Notification (575) 365-7995
Manager of Environmental for Water and Waste	Darrell Moore	(575) 748-3311 ext. 281	(575) 703-5058	(575) 703-5058
Logistics Section Maintenance Director	David Bolding	(575) 748-3311 ext. 444	(575) 365-2694	(575) 746-7646
Asst. Maintenance Supervisor	Trampas Spence	(575) 748-3311 ext. 395	(575) 365-2993	(575) 365-5071
Planning Section Maintenance Director	David Bolding	(575) 738-3311 ext. 444	(575) 365-2694	(575) 746-7646
Logistics Section Maintenance Department Coordinator	David Rowland	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section Purchasing Department	Mark Sanderson	(575) 748-3311 ext. 327	(575) 746-4828	(575) 365-7895
Finance Section – Expediter Purchasing Department	Jon Ross	(575) 748-3311 ext. 325	(575) 746-6452	(575) 365-4244

Navajo Refining External Notifications

Required External Notifications			
Agency	**Location**	**Office**	**Alternate**
National Response Center (NRC)	Washington, D.C.	(800) 424-8802	(202) 267-2675
Roswell State Police (SERC)	Roswell, NM	(575) 827-9223	(575) 622-7200
NM Energy, Minerals, and Natural Resources Department (OCD)	Artesia, NM (District 2)	(575) 748-1283	
Local Emergency Planning Committee (LEPC)	Carlsbad, NM	(575) 887-9511	(575) 887-7551
Assistance/Advisory Notifications (outside resources)			
Agency	**Location**	**Office**	**Alternate**
New Mexico Department of Game and Fish	Roswell, NM	(575) 624-6135	(575) 748-3036
New Mexico OSHA Bureau	Santa Fe, NM	(575) 827-2888	
OSHA (For Reportable Injury or Death)	Washington, D.C.	(800) 321-6724	
U.S. Environmental Protection Agency (EPA) Region IV	Dallas, TX	(800) 887-6063	(214) 665-2200
U.S. Fish and Wildlife Services (USFWS)	Albuquerque, NM	(505) 346-2525	
Bureau of Land Management (BLM)	Santa Fe, NM	(505) 438-7501	
New Mexico Health and Environmental Department	Santa Fe, NM	(505) 827-3723	
New Mexico Fire Marshal	Roswell, NM	(575) 347-5700	
National Weather Service (Recorded Forecasts) (NOAA)	Roswell, NM	(575) 347-5700	
Local Water Supply System	Artesia, NM	(575) 746-2122	(575) 746-2703
Local Emergency Services			
Agency	**Location**	**Office**	**Alternate**
Artesia Fire Department	Artesia, NM	911	(575) 746-2701
Eddy County Sheriff	Artesia, NM	911	(575) 746-9888
Artesia City Police	Artesia, NM	911	(575) 746-2703
Artesia Ambulance	Artesia, NM	911	(575) 746-2701
Artesia General Hospital	Artesia, NM	(575) 748-3333	
Eastern New Mexico Medical Center	Roswell, NM	(575) 622-1110	
Guadalupe Medical Center	Carlsbad, NM	(575) 887-4100	

Other Emergency Resources

Oil Spill Removal Organizations (OSRO)			
Company	**Location**	**Office**	**Alternate**
TAS Environmental Services, Inc.	Fort Worth, TX	(888) 654-0111	(800) 442-7637
Additional Response Recourses			
Company	**Location**	**Office**	**Alternate**
Indian Fire & Safety	Artesia, NM	(575) 393-3093	(800) 530-8693
I/W Hot Oil - Transports Service	Artesia, NM	(575) 746-4214	
Gandy Corporation - Transports Service	Lovington, NM	(575) 396-4948	
Jim's Water Service - Transports Service	Artesia, NM	(575) 748-1352	(575) 748-1352
O.K. Hot Oil	Loco Hills, NM	(575) 746-6233	
Swett Construction - Dirt Equipment	Artesia, NM	(575) 748-1238	
Davis Welding - Dirt Equipment	Artesia, NM	(575) 746-6306	
T&C Tank Rental - Temporary Storage	Artesia, NM	(575) 746-9788	
International Bird Rescue Center	Fairfield, CA	(707) 207-0380	
Tri-State Bird Rescue	Newark, NJ	(302) 737-9543	
KBIM - TV	Roswell, NM	(575) 622-2120	
KSVP - AM Radio	Artesia, NM	(575) 746-2751	

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

DISTRIBUTION

COPY #	LOCATION
1	SAFETY LIBRARY
2	ENVIRONMENTAL FILE ROOM
3	ENVIRONMENTAL MANAGER
4	PLANT MANAGER
5	OPERATIONS MANAGER
6	MAINTENANCE OFFICE
7	PSM COORDINATOR
8	NORTH CONTROL ROOM
9	SOUTH CONTROL ROOM
10	CORPORATE EH&S

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, March 12, 2010 4:35 PM
To: 'Lackey, Johnny'
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; 'Christy_Franklyn@schirmereng.com'; Whatley, Michael; Dade, Randy, EMNRD
Subject: RE: H2S Contingency Plan
Attachments: 19.15.11 NMAC.pdf; Pasquil-Gifford Model.pdf

Johnny:

The OCD has completed a review of your proposal for the above subject plan for the Artesia Refinery, and I presume would form the basis for the plan for the Lovington Refinery.

In general, the proposal to use the "PHAST" Model to model H2S Gas does not appear to be appropriate (see link http://cfpub.epa.gov/crem/knowledge_base/crem_report.cfm?deid=196448&view=PDF) where the model primary purpose is for simulating multi-component, reactive solute transport in 3-d saturated ground water flow systems, which is clearly not a gas transport model recommended in OCD Hydrogen Sulfide Regulations.

I notice that I don't see maps with detector locations, wind socks, location of "poison gas signs", location of units with flow where ROEs (100 and 500 ppm) would be depicted in public areas surrounding the refinery. Consequently, I am attaching the OCD's Regulations that references API Guidance, which is also not referenced in your proposal. Please take a look at the OCD Regulations and requirements and submit a H2S Contingency Plan that will address the regulations. The OCD provided an example (GW-33) from a Gas Plant that Navajo Refining Company should be using to develop a plan.

See OCD approved H2S Contingency Plan at OCD Online (GW-33) at http://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pENV000GW00034.

See attached OCD H2S Regulations to cross-check to make sure your plan addresses OCD Regulations. Also, information on the Pasquil-Gifford Model is attached to help you find another gas dispersion model or you can simply use this user friendly model to complete the plan (ROEs).

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Lackey, Johnny [mailto:Johnny.Lackey@hollycorp.com]
Sent: Wednesday, March 10, 2010 7:53 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; 'Christy_Franklyn@schirmereng.com'; Whatley, Michael
Subject: RE: H2S Contingency Plan

Carl. Attached is Navajo's proposal for your consideration. Included in the proposal is our worst case release scenario. After your review and comments, Navajo will prepare the H2S Contingency Plan for submittal to the agency and Emergency Response organizations.

Johnny Lackey

Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, February 05, 2010 1:48 PM
To: Lackey, Johnny
Subject: H2S Contingency Plan

Johnny:

Hi. I have not received Navajo Refining Company's proposal that you indicated during our last meeting related to the above subject.

One recommendation that I have based on our meeting and Navajo Refining Company's concern about the ROE is attempt to provide an illustration of a real worse case scenario based on refinery controls and operations, but explain and reference in appendices the scenario that complies with OCD regulations. In this way, you can present your real worse case and address OCD regulation in the contingency plan.

Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

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Toxic Release and Dispersion Models

Gausian Dispersion Models

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Practical and Potential Releases

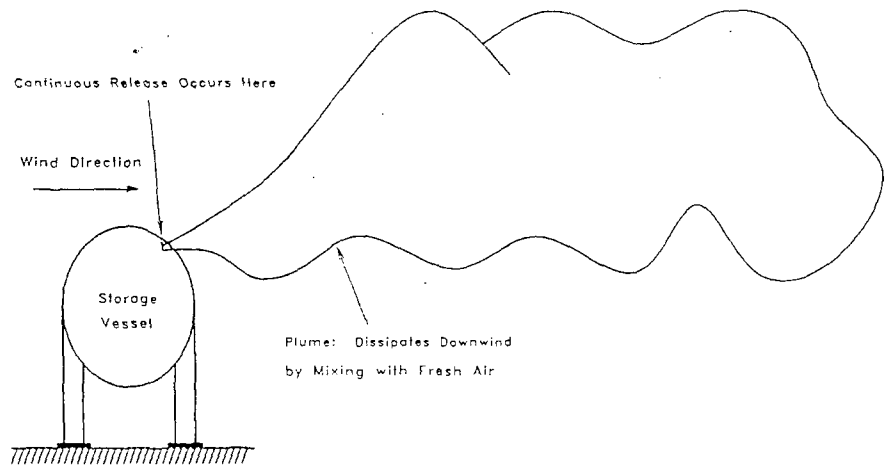
- During an accident process equipment can release toxic materials very quickly.
  - Explosive rupture of a process vessel due to excess pressure
  - Rupture of a pipeline with material under high pressure
  - Rupture of tank with material above boiling point
  - Rupture of a train or truck following an accident.

Practical and Potential Releases

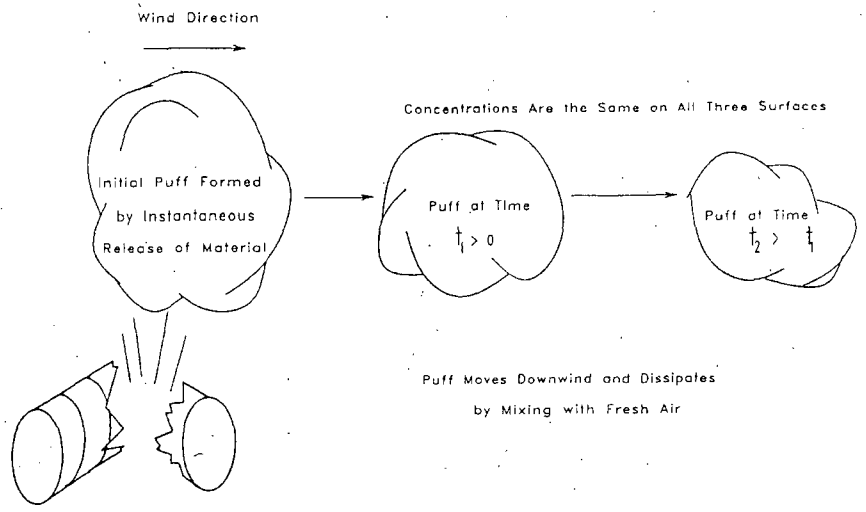
- Identify the Design basis
  - What process situations can lead to a release, and which are the worst situations
- Source Model
  - What are the process conditions and hence what will the state of the release and rate of release
- Dispersion Model
  - Using prevailing conditions (or worst case) determine how far the materials could spread

Types of Dispersion Models

- Plume models were originally developed for dispersion from a smoke stack.
- In an emergency if there is a leak in a large tank then a plume can develop.



Types of Dispersion Models



- Puff models are used when you have essentially an instantaneous release and the cloud is swept downwind.
- No significant plume develops

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

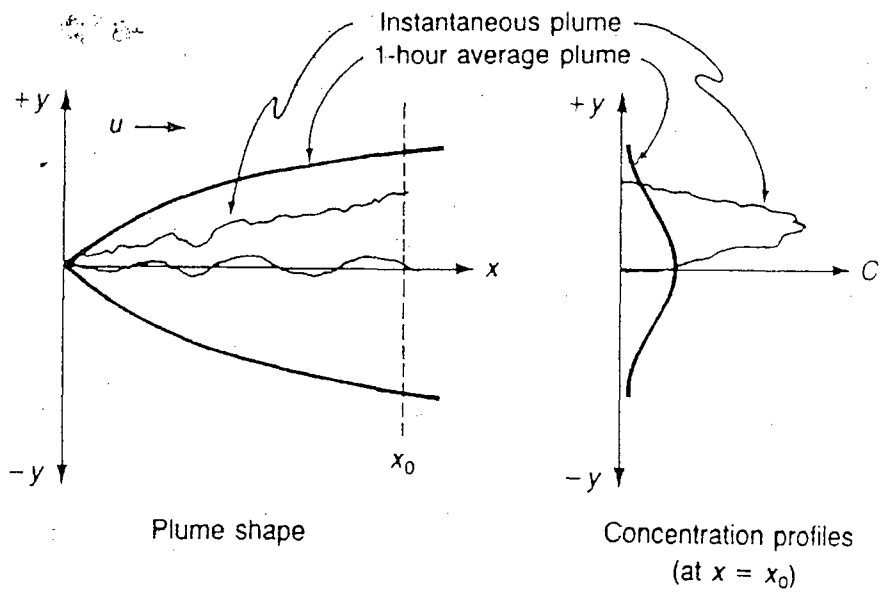
Pasquil-Gifford Dispersion Models

- Because of fluctuations and turbulence the eddy diffusivity is constantly changing and traditional transport phenomena equations don't do a good job of predicting dispersion.

- Solution is to assume that the materials spread out in a normal Gausian-type distribution.

Pasquil-Gifford Dispersion Models

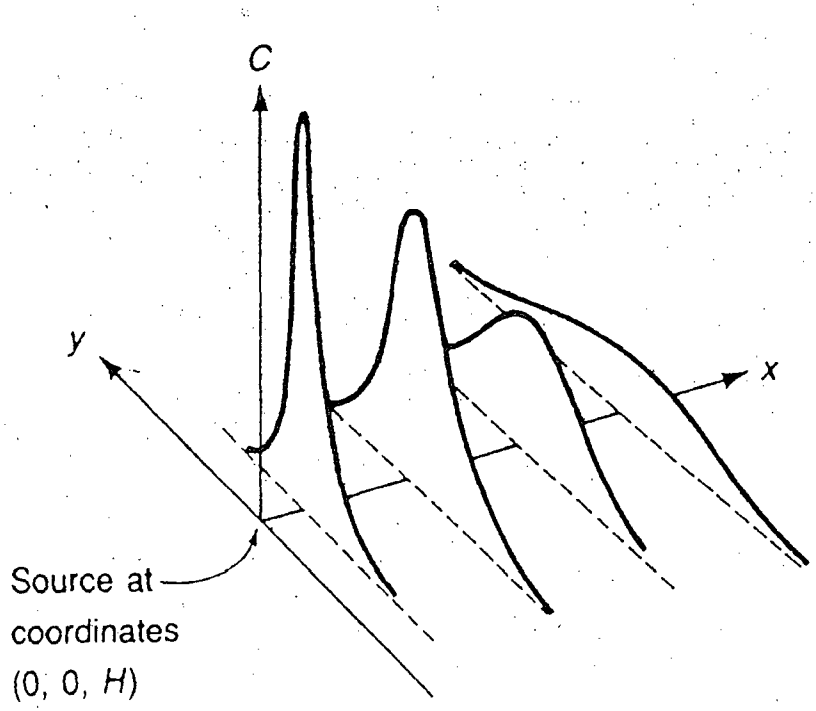
- For a plume the instantaneous value is different then the average.
- Develop correlations to predict the average concentration profile



Plume shape

Concentration profiles (at $x = x_0$)

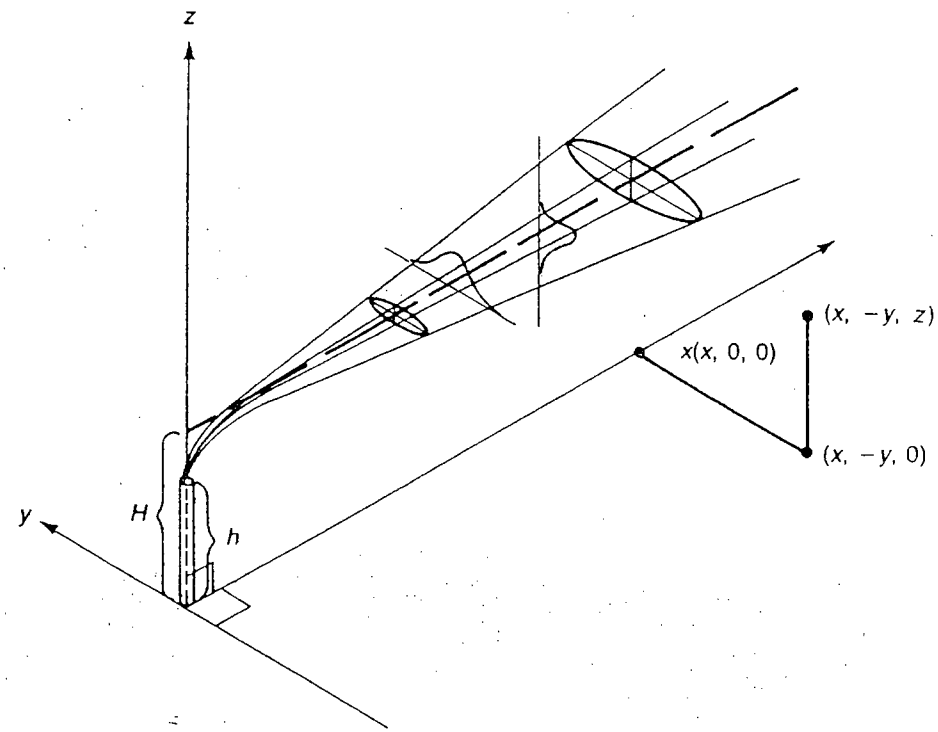
Pasquil-Gifford Dispersion Models



- As the plume is swept downwind, the concentration profile spreads out and decreases

Pasquil-Gifford Dispersion Models

- Have "dispersion coefficients" defined in the direction of the wind, in a cross wind direction and with elevation.
- These coefficients are correlated for six different stability classes.



Pasquil-Gifford Dispersion Models

- Table 5-2 gives the six stability classes to be used in the Pasquil-Gifford models.
  - For a given set of conditions, you can determine which stability class to use.
- Figure 5-10 and Figure 5-11 give the dispersion coefficients for as a function of distance downwind from release for Plume Models

Plume Model Dispersion Coefficients

TABLE 5-3 EQUATIONS AND DATA FOR PASQUILL-GIFFORD DISPERSION COEFFICIENTS[1]

Equations for continuous plumes

Stability class	σ_y (m)
A	$\sigma_y = 0.493x^{0.88}$
B	$\sigma_y = 0.337x^{0.88}$
C	$\sigma_y = 0.195x^{0.90}$
D	$\sigma_y = 0.128x^{0.90}$
E	$\sigma_y = 0.091x^{0.91}$
F	$\sigma_y = 0.067x^{0.90}$

Stability class	x (m)	σ_z (m)
A	100 - 300	$\sigma_z = 0.087x^{1.10}$
	300 - 3000	$\log_{10}\sigma_z = -1.67 + 0.902 \log_{10}x + 0.181(\log_{10}x)^2$
B	100 - 500	$\sigma_z = 0.135x^{0.95}$
	500 - 2×10^4	$\log_{10}\sigma_z = -1.25 + 1.09 \log_{10}x + 0.0018(\log_{10}x)^2$
C	100 - 10^5	$\sigma_z = 0.112x^{0.91}$
D	100 - 500	$\sigma_z = 0.093x^{0.85}$
	500 - 10^5	$\log_{10}\sigma_z = -1.22 + 1.08 \log_{10}x - 0.061(\log_{10}x)^2$
E	100 - 500	$\sigma_z = 0.082x^{0.82}$
	500 - 10^5	$\log_{10}\sigma_z = -1.19 + 1.04 \log_{10}x - 0.070(\log_{10}x)^2$
F	100 - 500	$\sigma_z = 0.057x^{0.80}$
	500 - 10^5	$\log_{10}\sigma_z = -1.91 + 1.37 \log_{10}x - 0.119(\log_{10}x)^2$

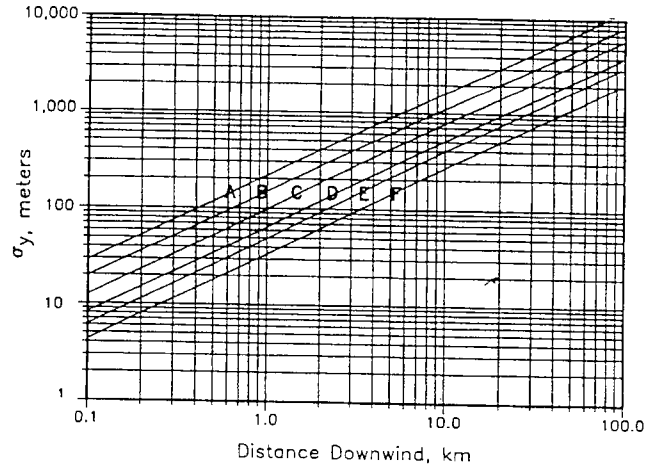


Figure 5-10 Horizontal dispersion coefficient for Pasquill-Gifford plume model. The dispersion coefficient is a function of distance downwind and the atmospheric stability class.

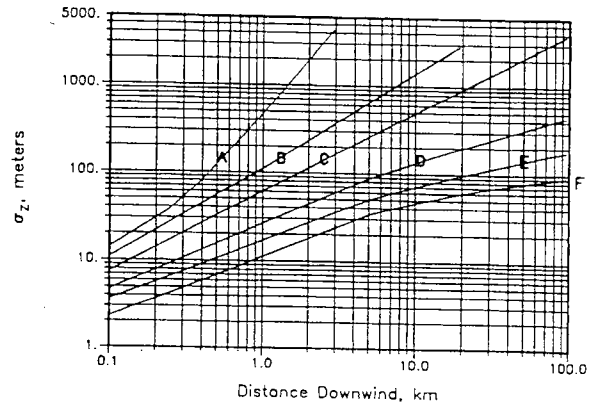


Figure 5-11 Vertical dispersion coefficient for Pasquill-Gifford plume model. The dispersion coefficient is a function of distance downwind and the atmospheric stability class.

Puff Model Dispersion Coefficients

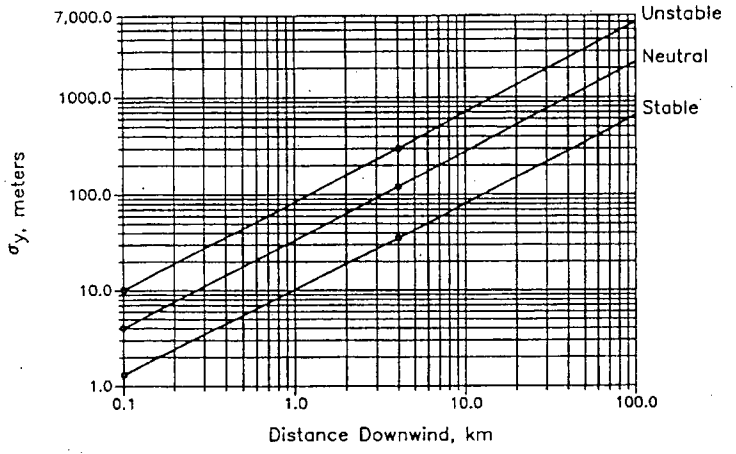


Figure 5-12 Horizontal dispersion coefficient for puff model. This data is based only on the data points shown and should not be considered reliable at other distances.

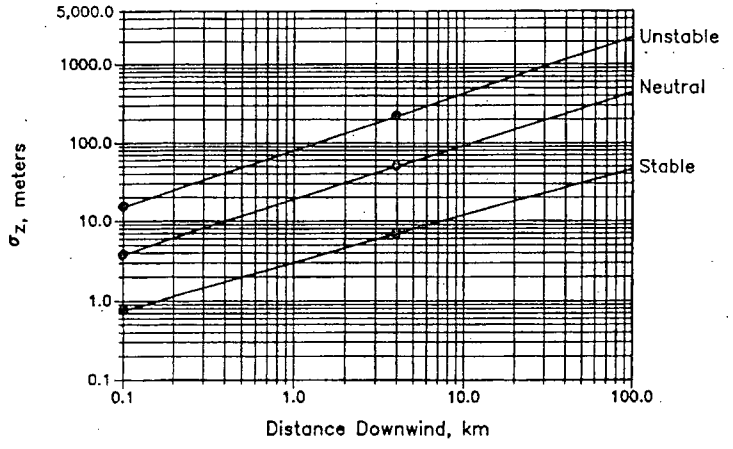


Figure 5-13 Vertical dispersion coefficient for puff model. This data is based only on the data points shown and should not be considered reliable at other distances.

$$\sigma_x = \sigma_y$$

$$Unstable -> \log_{10}\sigma_y = -0.84403 + 0.992014\log_{10}(x)$$

$$Neutral -> \log_{10}\sigma_y = 0.006425 + 0.297817\log_{10}(x)$$

$$Stable -> \log_{10}\sigma_y = -1.67141 + 0.892679\log_{10}(x)$$

$$Unstable -> \log_{10}\sigma_z = -0.27995 + 0.72802\log_{10}(x)$$

$$Neutral -> \log_{10}\sigma_z = -0.8174 + 0.698592\log_{10}(x)$$

$$Stable -> \log_{10}\sigma_z = -1.33593 + 0.605493\log_{10}(x)$$

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Plume Model

- Assumes plume has developed, hence it is continuous. Thus there is no "dispersion coefficient", σ_x, in the direction of flow (direction of the wind)

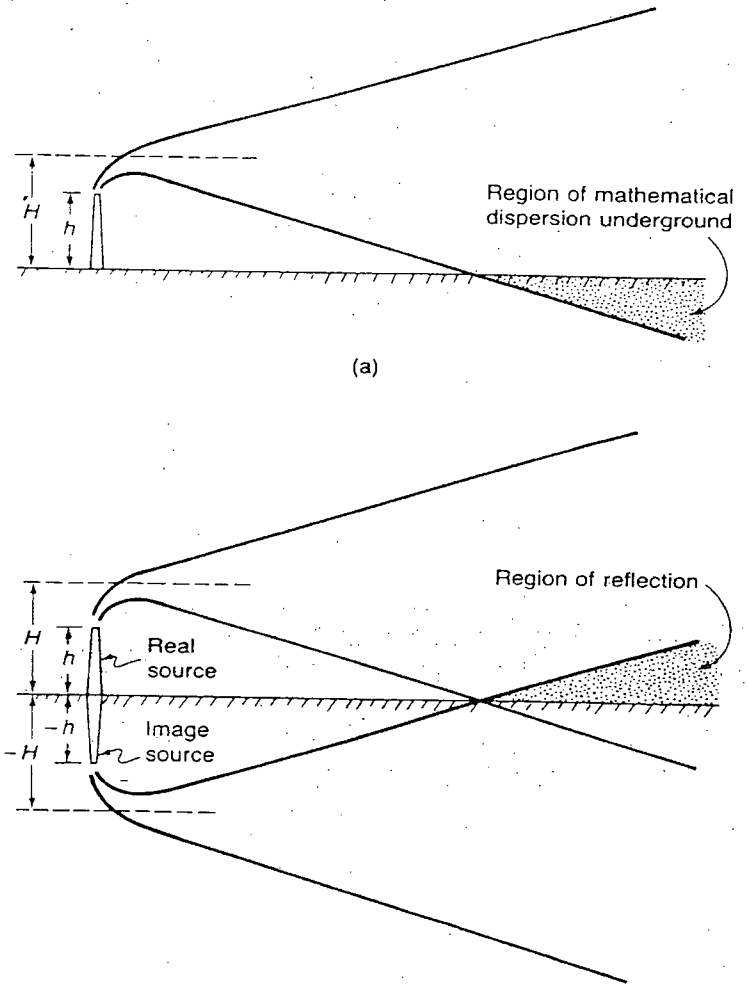
Plume Model

$$< C > (x, y, z) = \frac{\dot{Q}_m}{2\pi\sigma_y\sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y} \right)^2 \right]$$

$$\times \left\{ \exp\left[-\frac{1}{2}\left(\frac{z - Hr}{\sigma_z} \right)^2 \right] + \exp\left[-\frac{1}{2}\left(\frac{z + Hr}{\sigma_z} \right)^2 \right] \right\}$$

- Equation 5-49 is complete plume model
- Can simplify as needed

Plume Model



- Reason for last term in the expression is that as the gaseous plume is dispersed eventually you get reflection back off of the ground

Plume Model - Simplifications

If you a particulate or something that will react with the ground, then you remove "reflection" term

$$< C > (x, y, z) = \frac{\dot{Q}_m}{2\pi\sigma_y\sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y} \right)^2 \right]$$

$$\times \left\{ \exp\left[-\frac{1}{2}\left(\frac{z - Hr}{\sigma_z} \right)^2 \right] \right\}$$

Plume Model - Simplifications

- If your source is at ground level Hr is zero. Note the two terms add to two. Results in Eq. 5-46

$$< C > (x, y, z) = \frac{\dot{Q}_m}{\pi \sigma_y \sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y^2}{\sigma_y^{\,2}} + \frac{z^2}{\sigma_z^{\,2}} \right) \right]$$

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Puff Models

- Often in accidents, the releases are essentially instantaneous and no plume develops. Need to use a different dispersion model that is based on a puff.
- Now need to have "dispersion coefficient" in the wind direction. However, assume it is the same as in the cross wind (y) direction.
- Dispersion coefficients only defined for three stability classes (Unstable, Neutral, Stable). See bottom of Table 5-2.

Puff Model – Puff at height Hr

- Eq. 5-58 describes dispersion

$$< C > (x, y, z) = \frac{Q_m}{(2\pi)^{3/2}\sigma_x\sigma_y\sigma_z} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]$$

$$\times\left\{\exp\left[-\frac{1}{2}\left(\frac{z-Hr}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z+Hr}{\sigma_z}\right)^2\right]\right\}$$

$$\times\exp\left[-\frac{1}{2}\left(\frac{x-ut}{\sigma_x}\right)^2\right]$$

Puff Model - Simplification

- Ground level source. Eq. 5-38

$$< C > (x, y, z) = \frac{Q_m}{\sqrt{2}\pi^{3/2}\sigma_x\sigma_y\sigma_z} \exp\left[-\frac{1}{2}\left[\left(\frac{x-ut}{\sigma_x} \right)^2 + \left(\frac{y}{\sigma_y} \right)^2 + \left(\frac{z}{\sigma_z} \right)^2 \right] \right]$$

Puff Model-Simplification

- Coordinate system moves along with puff. Eq. 5-54

$$< C > (x, y, z) = \frac{Q_m}{(2\pi)^{3/2}\sigma_x\sigma_y\sigma_z} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]$$

$$\times\left\{\exp\left[-\frac{1}{2}\left(\frac{z-Hr}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z+Hr}{\sigma_z}\right)^2\right]\right\}$$

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
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  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Integrated Dose

- When a person is standing in a fixed location and a puff passes over, he/she receives a dose that is the time integral of the concentration.

$$D_{tid}(x,y,z) = \int_0^\infty < C > (x,y,z,t)dt$$

Integrated Dose

- For person on ground at distance y cross wind, Eq. 5-43

$$D_{tid}(x,y,0) = \frac{Q_m}{\pi\sigma_y\sigma_z u}\exp\left(-\frac{1}{2}\frac{y^2}{\sigma_y{}^2}\right)$$

- For person on ground at centerline of flow, Eq. 5-44

$$D_{tid}(x,0,0) = \frac{Q_m}{\pi\sigma_y\sigma_z u}$$

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Isopleths

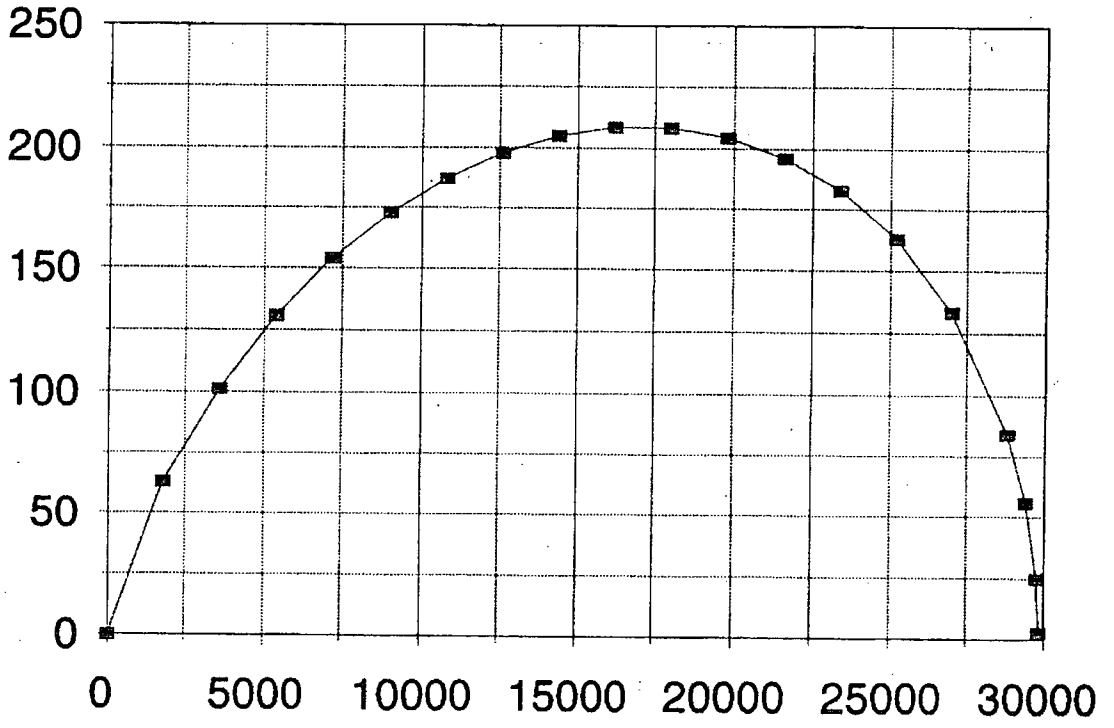
- An isopleth is a three dimensional surface of constant concentration.
- Calculated by
  - Specify desired $\langle C \rangle_{desired}$, u and t
  - Find concentration along x axis at that t $\langle C \rangle(x,0,0,t)$ to define boundaries and points along centerline
  - At each point to be evaluated find y using equation 5-45.

Isopleths

- Equation 5-45 makes more sense if you write it as follows

$$y = \sigma_y \sqrt{2 \ln \left(\frac{< C > (x,0,0,t)_{centerline}}{< C > (x,y,0,t)_{desired}} \right)}$$

Isopleths



Comparison of Plume & Puff Models

Puff model can used for continuous calculations by representing a plume as a succession of puffs.

Number of Puffs, n

$$n = \frac{t}{t_p}$$

Time to form Puff, t_p

$$t_p = \frac{H_{eff}}{u}$$

Effective Height, H_{eff}

$$H_{eff} = (\text{Leak Height}) \times 1.5$$

Continuous Leak

$$Q_m = \dot{Q}_m t_p$$

Instantaneous Leak Into Smaller Puffs

$$Q_m = \frac{(Q_m)_{total}}{n}$$

Effective Release Height

- Both the Plume and Puff model utilizes an effective release height, Hr.
- This is caused the momentum and buoyancy
- For release from a stack

$$\Delta H_r = \frac{\overline{u}_s d}{\overline{u}}\left[1.5 + 2.68\times10^{-3} Pd\left(\frac{T_s - T_a}{T_s}\right)\right]$$

ΔH_r = additional effective height, m

$\overline{u}_s$ = stack velocity, m/s

d = release (stack) diameter, m

$\overline{u}$ = wind speed, m/s

P = atmospheric pressure, mbar

T_a = air temperature, K

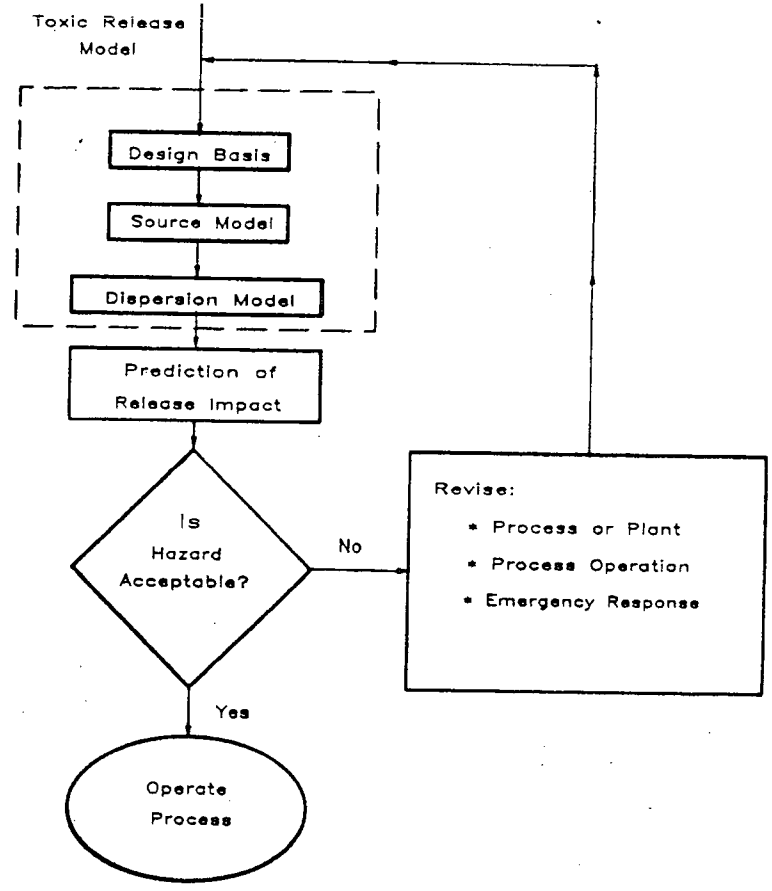
T_s = release gas temperature, K

Dispersion Models

- Practical and Potential Releases
- Pasquil-Gifford Models
  - Stability classes
  - Dispersion coefficients
- Plume Model
- Puff
  - Integrated dose
- Isopleths
- Release Mitigation
- Example

Release Mitigation

- Utilize toxic release models as a tool for release mitigation.
- Make changes in process, operations or emergency response scenarios according to results.



Release Mitigation

- Inherent Safety
  - Inventory reduction
  - Chemical substitution
  - Process attentuation
- Engineering Design
  - Physical integrity of seals and construction
  - Process integrity
  - Emergency control
  - Spill containment
- Management
  - Policies and procedures
  - Training for vapor release
  - Audits & inspections
  - Equipment testing
  - Routine maintenance
  - Management of change
  - Security

Release Mitigation

- Early Vapor Detection
  - Sensors
  - Personnel
- Countermeasures
  - Water sprays and curtains
  - Steam or air curtains
  - Deliberate ignition
  - Foams
- Emergency Response
  - On-site communications
  - Emergency shutdown
  - Site evacuation
  - Safe havens
  - PPE
  - Medical treatment
  - On-site emergency plans, procedures, training & drills

ChE 258
Chemical Process Safety

In Class Problem

A burning dump emits an estimated 3 g/s of oxides of nitrogen. What is the average concentration of oxides of nitrogen from this source directly downwind at a distance of 3 km on an overcast night with a wind speed of 7 m/s? Assume the dump to be a point ground-level source.

Solution

- Assume point source –plum develops
- x = 3 km
- Overcast night
- u=7 m/s
- Table 5.2 -> Stability class D

$$< C > (x, y, z) = \frac{\dot{Q}_m}{\pi \sigma_y \sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y^2}{\sigma_y^{\,2}} + \frac{z^2}{\sigma_z^{\,2}} \right) \right]$$

Solution

- Ground level concentration, z=0
- Centerline, y=0

$$< C > (x,0,0) = \frac{\dot{Q}_m}{\pi \sigma_y \sigma_z u}$$

$$\sigma_y = 0.128x^{.90} = 0.128(3000)^{.9} = 172m$$

$$\log_{10} \sigma_z = -1.22 + 1.08 \log_{10} x - 0.061(\log_{10} x)^2$$

$$\log_{10} \sigma_z = -1.22 + 1.08 \log_{10}(3000) - 0.061(\log_{10} 3000)^2$$

$$\log_{10} \sigma_z = 1.80$$

$$\sigma_z = 63m$$

Solution

$$< C > (3000, 0, 0) = \frac{\left(3\,{}^{g}/_{s}\right)}{\pi(172m)(63m)\left(7\,{}^{m}/_{s}\right)} = 1.26 \times 10^{-5}\ {}^{g}/_{m^3}$$

TITLE 19 NATURAL RESOURCES AND WILDLIFE
CHAPTER 15 OIL AND GAS
PART 11 HYDROGEN SULFIDE GAS

19.15.11.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.
[19.15.11.1 NMAC - N, 12/1/08]

19.15.11.2 SCOPE: 19.15.11 NMAC applies to a person subject to the division's jurisdiction, including a person engaged in drilling, stimulating, injecting into, completing, working over or producing an oil, gas or carbon dioxide well or a person engaged in gathering, transporting, storing, processing or refining of oil, gas or carbon dioxide. 19.15.11 NMAC does not exempt or otherwise excuse surface waste management facilities the division permits pursuant to 19.15.36 NMAC from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19.15.36 NMAC or more stringent conditions in permits issued pursuant to 19.15.36 NMAC, nor shall the facilities be exempt or otherwise excused from the requirements set forth in 19.15.11 NMAC by virtue of permitting under 19.15.36 NMAC.
[19.15.11.2 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.3 STATUTORY AUTHORITY: 19.15.11 NMAC is adopted pursuant to the Oil and Gas Act, NMSA 1978, Section 70-2-6, Section 70-2-11 and Section 70-2-12.
[19.15.11.3 NMAC - N, 12/1/08]

19.15.11.4 DURATION: Permanent.
[19.15.11.4 NMAC - N, 12/1/08]

19.15.11.5 EFFECTIVE DATE: December 1, 2008, unless a later date is cited at the end of a section.
[19.15.11.5 NMAC - N, 12/1/08]

19.15.11.6 OBJECTIVE: To require oil and gas operations be conducted in a manner that protects the public from exposure to hydrogen sulfide gas.
[19.15.11.6 NMAC - N, 12/1/08]

19.15.11.7 DEFINITIONS:

A. "ANSI" means the American national standards institute.

B. "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.

C. "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.

D. "Escape rate" means the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth in 19.15.11 NMAC.

(1) For existing gas facilities or operations, the escape rate is 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 is calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.

(2) For new gas operations or facilities, the escape rate is calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate is 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.

(3) For existing oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate of the maximum daily production rate.

(4) For new oil wells, the escape rate is 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.

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

E. "GPA" means the gas processors association.

F. "LEPC" means the local emergency planning committee established pursuant to the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. section 11001.

G. "NACE" means the national association of corrosion engineers.

H. "Potentially hazardous volume" means the volume of hydrogen sulfide gas of such concentration that:

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

(2) the 500-ppm radius of exposure includes a public road; or

(3) the 100-ppm radius of exposure exceeds 3000 feet.

I. "Public area" means a 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 a 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 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] present.

J. "Public road" means a federal, state, municipal or county road or highway.

K. "Radius of exposure" means the 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 the division may approve:

(1) for determining the 100-ppm radius of exposure: X = [(1.589)(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 psi absolute and 60 degrees fahrenheit);

(2) for determining the 500-ppm radius of exposure: X = [(0.4546)(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 psi absolute and 60 degrees fahrenheit);

(3) 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 3000 feet is assumed.
[19.15.11.7 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.8 REGULATORY THRESHOLD:
A. Determination of hydrogen sulfide concentration.

(1) Each person shall determine the hydrogen sulfide concentration in the gaseous mixture within 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 the person uses a representative sample or process knowledge, the concentration derived from the representative sample or process knowledge shall be reasonably representative of the hydrogen sulfide concentration within the well, facility or operation.

(2) The person shall conduct the tests used to make the determination referred to in Paragraph (1) of Subsection A of 19.15.11.8 NMAC in accordance with applicable ASTM or GPA standards or by another division-approved method.

(3) If the person conducted a test prior to January 31, 2003 that otherwise meets the requirements of Paragraphs (1) and (2) of Subsection A of 19.15.11.8 NMAC, new testing is not required.

(4) If a change or alteration may materially increase the hydrogen sulfide concentration in a well, facility or operation, the person shall make a new determination in accordance with 19.15.11 NMAC.

B. Concentrations determined to be below 100 ppm. If the hydrogen sulfide concentration in a given well, facility or operation is less than 100 ppm, the person is not required to take further actions pursuant to 19.15.11 NMAC.

C. Concentrations determined to be above 100 ppm.

(1) If the person determines the hydrogen sulfide concentration in a given well, facility or operation is 100 ppm or greater, then the person shall calculate the radius of exposure and comply with applicable requirements of 19.15.11 NMAC.

(2) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide results of the hydrogen sulfide concentration determination and the calculation of the radius of exposure to the division. For a well, facility or operation, the person shall accomplish the determination, calculation and submission 19.15.11.8 NMAC requires before operations begin.

D. Recalculation. The person 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 shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of 25 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 person shall provide the results to the division within 60 days.
[19.15.11.8 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.9 HYDROGEN SULFIDE CONTINGENCY PLAN:

A. When required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, the person shall develop a hydrogen sulfide contingency plan that the person will use to alert and protect the public in accordance with the Subsections B through I of 19.15.11.9 NMAC.

B. Plan contents.

(1) API guidelines. The person shall develop the hydrogen sulfide contingency plan with due consideration of paragraph 7.6 of the guidelines in the API publication 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 division-approved standard.

(2) Required contents. The hydrogen sulfide contingency plan shall contain information on the following subjects, as appropriate to the well, facility or operation to which it applies.

(a) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures the person will follow 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 Paragraph (1) of Subsection B of 19.15.11.9 NMAC, 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 road blocks and procedures for notifying the public, either through direct telephone notification using telephone number lists or by means of mass 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] notification and reaction plans. The plan shall include information on the availability and location of necessary safety equipment and supplies.

(b) 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.

(c) 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.

(d) 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 person will document the training, drills and attendance. 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.

(e) Coordination with state emergency plans. The hydrogen sulfide contingency plan shall describe how the person will coordinate emergency response actions under the plan with the division and the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan.

(f) 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.

C. Plan activation. The person shall activate the hydrogen sulfide contingency plan when a release creates a hydrogen sulfide concentration greater than the activation level set forth in the hydrogen sulfide contingency plan. At a minimum, the person shall activate the plan whenever a release may create a hydrogen sulfide concentration of more than 100 ppm in a public area, 500 ppm at a public road or 100 ppm 3000 feet from the site of release.

D. Submission.

(1) Where submitted. The person shall submit the hydrogen sulfide contingency plan to the division.

(2) When submitted. The person shall submit a hydrogen sulfide contingency plan for a new well, facility or operation before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation shall be on file with the division before operations commence and may be submitted separately or along with the APD or may be on file from a previous submission. A person shall submit a hydrogen sulfide contingency plan within 180 days after the person 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.

(3) Electronic submission. A filer who operates more than 100 wells or who operates an oil pump station, compressor station, refinery or gas plant shall submit each hydrogen sulfide contingency plan in electronic format. The file may submit the hydrogen sulfide contingency plan 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.

E. Failure to submit plan. A person's 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.

F. Review, amendment. The person 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 to add provisions to the plan or amend the plan as necessary to protect public safety.

G. 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 division inspection.

H. Annual inventory of contingency plans. On an annual basis, each person required to prepare one or more hydrogen sulfide contingency plans pursuant to 19.15.11 NMAC 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.

I. Plans required by other jurisdictions. The person may submit a hydrogen sulfide contingency plan to the BLM or other jurisdiction require that meets the requirements of 19.15.11.9 NMAC to the division in satisfaction of 19.15.11.9 NMAC.
[19.15.11.9 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.10 SIGNS, MARKERS: For each well, facility or operation involving a hydrogen sulfide concentration of 100 ppm or greater, the person shall install and maintain signs or markers that conform with the current ANSI standard Z535.1-2002 (Safety Color Code), or some other division-approved standard. The sign or marker shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. The person shall prominently post signs or markers at locations, including entrance points and road crossings, sufficient to alert the public that a potential danger exists.
[19.15.11.10 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.11 PROTECTION FROM HYDROGEN SULFIDE DURING DRILLING, COMPLETION, WORKOVER AND WELL SERVICING OPERATIONS:

A. API standards. The person shall conduct drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publications 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 Hydrogen Sulfide, RP-49, most recent editions, or some other division-approved standard.

B. Detection and monitoring equipment. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide 19.15.11 NMAC
http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] concentration of 100 ppm or greater shall include hydrogen sulfide detection and monitoring equipment as follows.

(1) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the hydrogen sulfide's ambient air concentration reaches a predetermined value the operator sets, not to exceed 20 ppm. The operator shall locate a sensing point 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.
(2) For workover and well servicing operations, the person shall locate one operational sensing point as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.

(3) The operator shall provide and maintain as operational hydrogen sulfide detection and monitoring equipment during drilling when

drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

C. Wind indicators. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. The person shall have equipment to indicate wind direction present and visible at all times. The person shall install at least two devices to indicate wind direction at separate elevations that visible from all principal working areas at all times. When a sustained hydrogen sulfide concentration is detected in excess of 20 ppm at a detection point, the person shall display red flags.

D. Flare system. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous hydrogen sulfide volume will be encountered, the person shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. The person shall locate flare outlets at least 150 feet from the well bore. Flare lines shall be as straight as practical. The person shall equip the flare system with a suitable and safe means of ignition. Where oncombustible gas is to be flared, the system shall provide supplemental fuel to maintain ignition.

E. Well control equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment is required.

(1) Drilling. The person shall install a remote-controlled well control system that is operational at all times beginning when drilling is within 500 vertical feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system shall 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 in API publications Choke and Kill Systems, 16C and Blowout Prevention Equipment Systems for Drilling Wells, RP 53 or other division-approved specifications. The person shall use mud-gas separators. The person

shall test and maintain these systems pursuant to the specifications referenced, according to the requirements of 19.15.11 NMAC, or as the division otherwise approves.

(2) Completion, workover and well servicing. The person shall install a remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other division-approved specifications that is operational at all times during a well's completion, workover and servicing.

F. Mud program. 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.

G. Well testing. except with prior division approval, a person shall conduct drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater only during daylight hours and not permit formation fluids to flow to the surface.

H. 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 shall satisfy the requirements of 19.15.11 NMAC before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that the operator has or is taking 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 a required hydrogen sulfide contingency plan. [19.15.11.11 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.12 PROTECTION FROM HYDROGEN SULFIDE AT OIL PUMP STATIONS, PRODUCING WELLS, TANK

BATTERIES AND ASSOCIATED PRODUCTION FACILITIES, PIPELINES, REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS:

A. API standards. A person shall conduct operations at oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, latest edition or some other division-approved standard.

B. Security. A person shall protect well sites and other unattended, fixed surface facilities involving a hydrogen sulfide concentration of 100 ppm or greater from public access by fencing with locking gates when the location is within 1/4 mile of a public area. For the purposes of Subsection B of 19.15.11.12 NMAC, a surface pipeline is not considered a fixed surface facility.

C. Wind direction indicators. Oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater shall have equipment to indicate wind direction. The person shall install wind direction equipment that is visible from all principal working areas at all times.

D. Control equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required.

(1) The person shall install and maintain in good operating condition safety devices, such as automatic shut-down devices, to prevent hydrogen sulfide's escape. Alternatively, the person shall establish safety procedures to achieve the same purpose.

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

E. Tanks or vessels. The person shall chain each stair or ladder leading to the top of a tank or vessel containing 300 ppm or more 19.15.11 NMAC
http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] of hydrogen sulfide in the gaseous mixture or mark it to restrict entry. [19.15.11.12 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.13 PERSONNEL PROTECTION AND TRAINING: The person shall provide persons responsible for implementing a hydrogen sulfide contingency plan training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.
[19.15.11.13 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE: Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide's corrosive effects.
[19.15.11.14 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.15 EXEMPTIONS: A person may petition the director or the director's designee for an exemption to a requirement of 19.15.11 NMAC. A petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the person will protect public safety. 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 person protects public safety.
[19.15.11.15 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.16 NOTIFICATION OF THE DIVISION: The person 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 supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.
[19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

HISTORY of 19.15.11 NMAC:
History of Repealed Material: 19.15.3 NMAC, Drilling (filed 10/29/2001) repealed 12/1/08.
NMAC History:
That applicable portion of 19.15.3 NMAC, Drilling (Section 118) (filed 10/29/2001) was replaced by 19.15.11 NMAC, Hydrogen Sulfide Gas, effective 12/1/08.

Chavez, Carl J, EMNRD

From: Lackey, Johnny [Johnny.Lackey@hollycorp.com]
Sent: Wednesday, March 10, 2010 7:53 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Moore, Darrell; Meeks, Jimmy; 'Christy_Franklyn@schirmereng.com'; Whatley, Michael
Subject: RE: H2S Contingency Plan
Attachments: Navajo Refining H2S Contingency Proposal.pdf

Carl. Attached is Navajo's proposal for your consideration. Included in the proposal is our worst case release scenario. After your review and comments, Navajo will prepare the H2S Contingency Plan for submittal to the agency and Emergency Response organizations.

Johnny Lackey
Environmental Manager
Navajo Refining Company, L.L.C.
Office - 575-746-5490
Cell - 972-261-8075
Fax - 575-746-5451
Johnny.Lackey@hollycorp.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, February 05, 2010 1:48 PM
To: Lackey, Johnny
Subject: H2S Contingency Plan

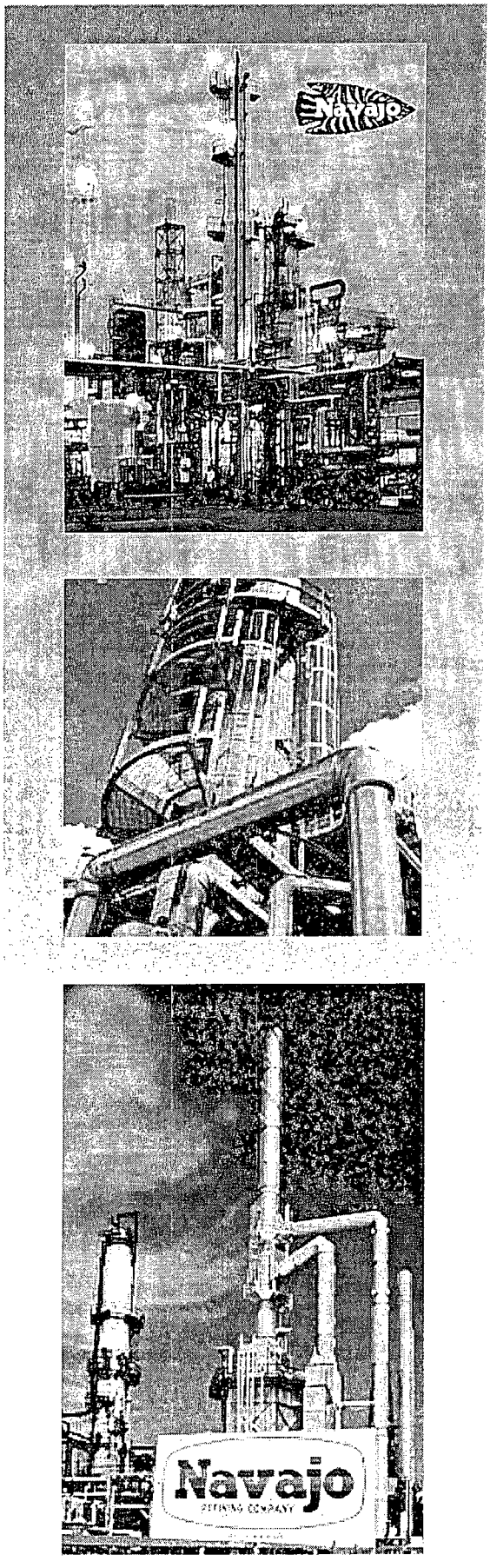
Johnny:

Hi. I have not received Navajo Refining Company's proposal that you indicated during our last meeting related to the above subject.

One recommendation that I have based on our meeting and Navajo Refining Company's concern about the ROE is attempt to provide an illustration of a real worse case scenario based on refinery controls and operations, but explain and reference in appendices the scenario that complies with OCD regulations. In this way, you can present your real worse case and address OCD regulation in the contingency plan.

Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")



Hydrogen Sulfide Contingency Plan Proposal

Navajo Artesia Refinery
Holly Corporation

February 2010

Navajo Refining Company •
501 E. Main Street, Artesia NM • 88211

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H2S CONTINGENCY PLAN PROPOSAL

NAVAJO ARTESIA REFINERY

1.0 REFINERY DESCRIPTION

The Navajo Artesia refinery processes crude oil as well as intermediates received from outside sources, such as Navajo's Lovington, NM refinery and other third-party sources. Crude oil and intermediates are purchased as needed or as justified on an economic basis. The crude oil and other intermediates enter the Artesia refinery via pipeline, truck, or rail. The Artesia refinery produces butane, propane, liquefied petroleum gas (LPG), jet fuels, kerosenes, diesel fuels, various grades of gasoline, carbon black oil (CBO), gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Navajo Artesia refinery produces refinery fuel gas, hydrogen, nitrogen, and steam. The combined facility charge capacity is approximately 100,000 bbl/ day.

Process units at the refinery include:

- Alkylation Unit
- Amine Unit
- Atmospheric Crude Distillation Units
- Boilers
- CCR Reformer
- Cooling Towers
- Crude Oil Receiving and Storage
- Diesel Hydrotreating Unit
- Flares
- Flasher/Vacuum Distillation Unit
- Fluid Catalytic Cracking Unit
- Gas Oil Hydrotreating Unit
- Hydrocracking Unit
- Hydrogen Production Units
- Isomerization (or Penex) Unit
- Kerosene Hydrotreating Unit
- LPG Pressure Tanks
- MEROX®/Merichem Treaters
- Naphtha Hydrotreating Units
- PBC Butane Splitter Unit
- Saturates Gas Plants
- Solvent De-Asphalting Unit (ROSE Unit)
- Sour Water Strippers
- Storage Tanks
- Sulfur Recovery Units
- Utility and Vessels
- Wastewater Collection and Treatment System

H2S is produced by processing, primarily by hydrogen de-sulphurization, products distilled from crude oil, naphtha, kerosene, diesel, and gas oils at the Artesia Refinery. Small amounts of H2S are present in crude oil and are recovered during distillation into fuel gas. Sour gas streams produced by processing and sour fuel gas from the crude unit are contacted with amine to recover H2S from sour gas streams. The amine solution that absorbs the H2S is circulated to a steam re-boiled Stripping Tower to regenerate the amine for re-use in contacting sour gas. The off-gas from the Amine Stripping Tower is sent to a Sulfur Recovery Unit (SRU) to convert the H2S into elemental sulfur.

The Sulfur Recover Units have the highest concentration of H2S.

1.1 Sulfur Recovery Units (SRUs)

The Artesia Refinery currently uses two, three-stage Claus sulfur recovery units (SRU1 and SRU2), a common tail gas treatment unit (TGTU), and a common tail gas incinerator (TGI). Navajo also has an additional sulfur recovery unit (SRU3). The new SRU has its own TGTU (TGTU3) and its own TGI (TGI3).

The sulfur recovery process significantly reduces air pollution and generates steam for refinery consumption.

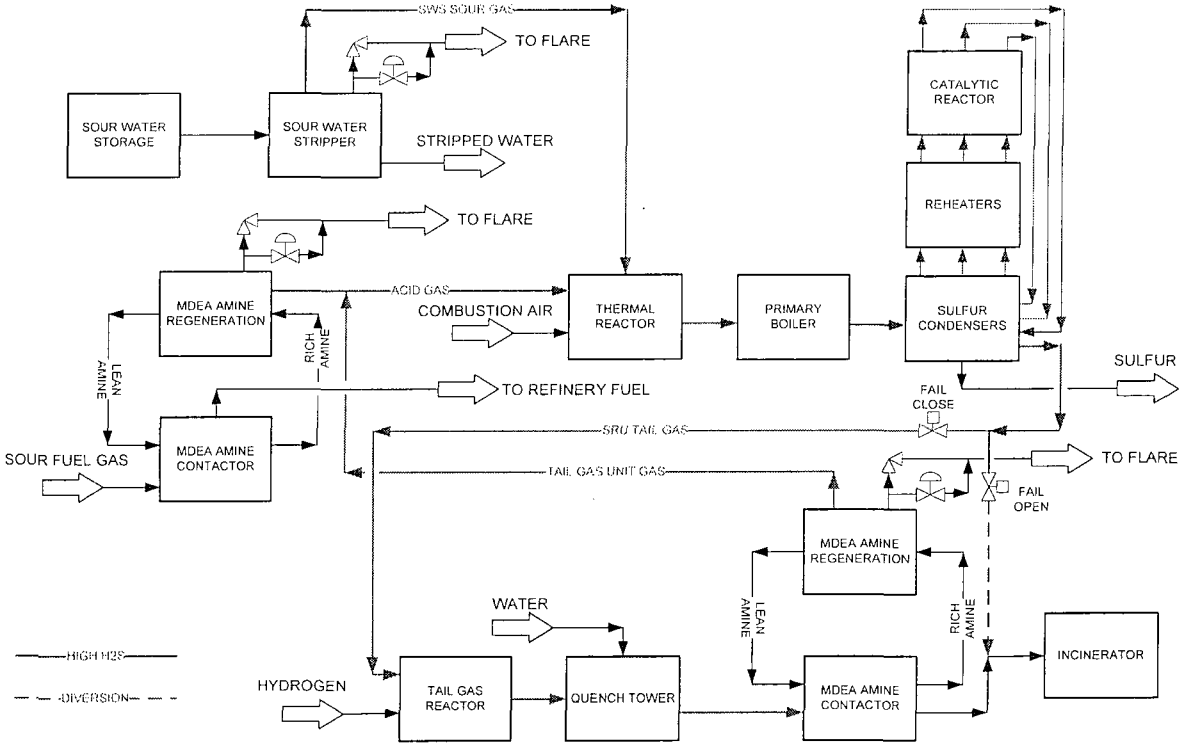
A Claus sulfur recovery unit converts H_2S to elemental sulfur by first oxidizing one-third of the H_2S to SO_2 to form elemental sulfur.

The acid gas first passes through knockout drums designed to remove entrained sour water and condensed hydrocarbons from the amine acid gas and the sour water stripper gas. The gases are then fed to a thermal reactor. Heat for the reactor is provided by the combustion of the acid gas.

Tail gas containing unrecovered sulfur compounds flows from the SRU to the TGTU where the sulfur compounds pass through a reactor converting the sulfur compounds into the H_2S. The reactor effluent then flows into a vessel for contact with lean (low sulfur) amine solution. The H_2S is absorbed by the amine while the treated tail gas flows to the TGI for combustion. The rich (high sulfur) amine solution then flows from the contactor to a stripper column, which regenerates, lean amine from rich amine by removing the H_2S. The concentrated H_2S gas stream produced by the stripper is recycled to the SRU. The regenerated lean amine is pumped back to the contactor for reuse.

The TGI will receive any remaining gases from the TGTU, as well as the vent stream from the sulfur pit. The TGI will further reduce H_2S emissions by combusting the H_2S to SO_2. Continuous emissions monitor systems (CEMS) will continuously measure and record sulfur dioxide (SO_2) concentrations in each TGI stack.

The sulfur recovery process is illustrated in Figure 1.



ARTESIA SULFUR RECOVERY

Figure 1. Navajo Artesia Refinery Sulfur Recovery Flow Diagram

2.0 REGULATORY COMPLIANCE

In addition to New Mexico's Energy, Minerals and Natural Resources Department, Oil Conservation Division's H2S Contingency Plan requirements (Title 19, Chapter 15, Oil and Gas, Part 11, Hydrogen Sulfide Gas), the Navajo Artesia Refinery is in compliance with other regulations that govern facilities with threshold quantities of H2S.

2.1 Process Safety Management

The Occupational Safety and Health Administration's (OSHA) Process Safety Management Regulation requires facilities with threshold quantities of listed flammable and toxic materials to comply with 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals.* Hydrogen sulfide is included in OSHA's List of Highly Hazardous Chemicals, Toxics and Reactives and the Navajo Refinery exceeds the threshold planning quantity of 1,500 lbs.

This comprehensive safety and risk reduction regulation requires facilities to establish management systems to manage the hazards associated with the materials they use and process. These management systems include:

- Process Safety Information
- Process Hazard Analysis
- Operating Procedures
- Employee Participation
- Training
- Contractors
- Pre-Startup Safety Review
- Mechanical Integrity
- Hot Work Permit
- Management of Change
- Incident Investigation
- Emergency Planning and Response
- Compliance audits
- Trade Secrets

These management systems are robust and work together to prevent the release of hydrogen sulfide and other materials.

2.2 Risk Management Program

The Environmental Protection Agency's Risk Management Program (RMP) rule requires facilities with threshold quantities of toxic and flammable materials to comply with the requirements of 40 CFR Part 68, Accidental Release Prevention, Risk Management Plan. This regulation contains these key parts:

- Prevention Program (which mirrors the requirements in OSHA's PSM regulation discussed above).
- Hazard Assessment, including worst-case and alternative case release modeling
- Emergency Response

Although the Navajo Refinery does not meet the 10,000 lb threshold quantity of H2S onsite, the refinery has other materials that meet the threshold requirements and therefore, is in compliance with these regulatory requirements.

Of particular interest are the EPA's requirements for defining the worst-case release scenarios. For toxic materials, the worst-case scenario is defined as a 10 minute release of the entire contents of the vessel with the largest quantity of the material:

> § 68.25 Worst-case release scenario analysis.
>
> *(b) Determination of worst-case release quantity. The worst-case release quantity shall be the greater of the following:*
>
> *(1) For substances in a vessel, the greatest amount held in a single vessel, taking into account administrative controls that limit the maximum quantity; or*
>
> *(2) For substances in pipes, the greatest amount in a pipe, taking into account administrative controls that limit the maximum quantity.*
>
> *(c) Worst-case release scenario - toxic gases. (1) For regulated toxic substances that are normally gases at ambient temperature and handled as a gas or as a liquid under pressure, the owner or operator shall assume that the quantity in the vessel or pipe, as determined under paragraph (b) of this section, is released as a gas over 10 minutes. The release rate shall be assumed to be the total quantity divided by 10 unless passive mitigation systems are in place.*

This definition of worst-case release scenario is also consistent with the following state requirements for facilities that handle above threshold quantities of hydrogen sulfide:

- **California:** *California Code of Regulations, Title 19. Public Safety, Division 2. Office Of Emergency Services, Chapter 4.5 California Accidental Release Prevention (CalARP) Program*
- **New Jersey:** *Toxic Catastrophe Prevention Act (TCPA) Program*
- **Louisiana:** *Chemical Accident Prevention Regulations (LAC 33:III.Chapter 59)*
- **Nevada:** *Chemical Accident Prevention Program (CAPP)*

3.0 SAFETY SYSTEMS

3.1 Emergency Shutdown Systems

The SRU is equipped with an emergency shutdown (ESD) that can be initiated at the unit or remotely from the control room. The ESD will cause the following actions:

- Trip SRU Burner Management System (BMS)
- Trip Incinerator BMS
- Trip Oil Heater Furnace BMS
- Block sour gas flow to the Sulfur Plant

In addition to the operator initiated shutdowns, the unit will automatically shutdown due to:

- High catalytic bed temperatures (excess air) in either the SRU or the Tail Gas Unit
- Loss of flame in the Thermal Reactor
- Low combustion air flow
- High level in feed knock-out drums
- Low Boiler water level

In the event of an SRU trip and the redundant SRU(s) can not handle the required capacity, the acid gas will be diverted to flare and the refinery will immediately begin sulfur shedding to minimize acid gas flaring.

3.2 Relief Systems and Sour Gas Flaring Procedure

The Artesia refinery strategy is to minimize acid gas flaring under all operating scenarios. However, in the event of power failures, instrument failures, or the inability to treat all the acid gas, the acid gas will be flared. Under NSR Permit No. PSD-NM-0195-M26R2 the refinery will add supplemental fuel gas while flaring acid gas to comply with NAAQS for SO2.

Acid gas flaring will be initiated when the SRUs are unable to treat acid gas. The Amine Regeneration (Steam Reboiled Strippers) is equipped with a pressure control valve with a set-

point higher than normal operating pressure of the stripper. With the acid gas blocked during a SRU trip, the pressure on the Stripper will increase until the pressure control valve set-point to flare is exceeded. The Stripper will then begin to send acid gas to the flare to maintain the pressure of the Stripper. Sulfur Shedding procedures are initiated immediately when problems with the SRU are determined.

3.3 Sulfur Shedding to Minimize Acid Gas Flaring

Roughly 99% of all the H2S in the refinery is produced by processes at the refinery, .i.e. hydrotreating, cracking, etc. Sour gas from theses processes are contacted with amine to absorb the H2S and sweeten the gas streams prior to being sent to the refinery fuel system. In conjunction with the sour gas streams, sour water is produced and must be stripped. Sour water is stripped in a sour water stripper to produce a stripped water low enough in H2S for refinery re-use and a sour gas stream that is treated in the SRUs. Depending on which SRU goes down, different shedding scenarios are followed. In general the following steps are followed:

- Shutdown sour water strippers and inventory sour water in storage tanks
- Cut steam to amine strippers and increase H2S loading in rich amine
- Reduce charge to hydrotreating units and cut reactor temperature

3.4 Fixed H2S Detection Systems

Local H2S detectors are installed at all locations where H2S levels were determined during HAZOP studies to be high. These alarms are set to alarm at concentrations higher than 10 ppm. A remote alarm is initiated in the control room along with local beacons and alarms located in the unit.

3.5 PSM - Mechanical Integrity

The refinery maintains a staff of 4 inspectors and contract inspectors when necessary to ensure the mechanical integrity of the plant remains up to code. Controls and emergency shutdown systems are periodically tested to ensure proper operation. Operating procedures are maintained and updated as necessary in operating manuals for the unit.

3.6 Operations Field Monitoring of the Unit

The refinery has unit operators who walk-down the unit on an hourly basis. Their duty is to visually inspect the unit for any problems that can not be monitored from the control room.

4.0 PROPOSED H2S SCENARIO DESCRIPTION

Based on the regulatory requirements in Title 19, Chapter 15, Part 11, Section 19.15.11.7 D. (5):

> *For facilities or operations not mentioned, the escape rate is calculated using the actual flow of the gaseous mixture through the system or the best estimate of the actual flow of the gaseous mixture through the system.*

and Section 19.15.11.7 K.:

> *"Radius of exposure" means the 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 the division may approve: . . .*

Navajo Refining proposes to identify the vessel with the largest inventory and highest concentration of H2S and model a release of the entire contents over a 10-minute period. This scenario will most likely originate in Unit 31, Sulfur Recovery Unit, and will be modeled using conservative operating and weather conditions.

Based on the safety systems discussed above, this worst-case scenario is highly unlikely and truly represents a worst-case impact on the community.

This worst-case definition is consistent with other state and federal requirements.

4.1 Consequence Model

To conservatively estimate the consequences to employees and the community, Navajo Refining proposes to use the PHAST computer model to calculate the distance to 100 ppm and 500 ppm H2S. PHAST (Process Hazard Analysis Software Tool), by DNV Software, is used to assess situations which present potential hazards to life, property and the environment, and to quantify their severity. PHAST examines the progress of a potential incident from the initial release to far-field dispersion including modeling of pool spreading and evaporation, and flammable and toxic effects. PHAST uses proprietary techniques to model heavier than air gases and Pasquill-Gifford (Gaussian) equations for all other vapor clouds. In this case, H2S will be heavier than air for a short period of time, but it will quickly become Gaussian in nature.

The results from the analysis can be displayed in tabular & graphical form, so the extent of the impact can be seen, and the effect of the release on the population and environment assessed.

PHAST is designed to comply with the regulatory requirements of many countries. For example, specific modules have been included to ensure compliance with the The Netherlands, US EPA and UK HSE regulations.

4.2 Community Impact

Navajo Refining proposes to use the Landview computer model to identify the areas of the community impacted by 100 ppm and 500 ppm.

LandView has its roots in the CAMEO (Computer-Aided Management of Emergency Operations). CAMEO was developed by the EPA and the NOAA to facilitate the implementation of the Emergency Planning and Community Right-to-Know Act. This far-reaching law requires communities to develop emergency response plans addressing chemical hazards and to make available to the public information on chemical hazards in the community. Released January 20, 2004, LandView 6 updates the Census 2000 statistical data as well as the Environmental Protection Agency (EPA) and U.S. Geological Survey (USGS) databases contained in LandView 5 that was released in November, 2002.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, January 28, 2010 6:25 AM
To: 'Ed.Riege@wnr.com'; 'Schmaltz, Randy'
Cc: VonGonten, Glenn, EMNRD; 'Lackey, Johnny'
Subject: FW: H2S Contingency Plan Checklist.docx
Attachments: 19.15.11 NMAC.doc; H2S Plan Checklist.docx

Gentlemen:

You may recall that the OCD had alerted you to the New Mexico Oil Conservation Division hydrogen sulfide gas regulations and the requirement to have a H2S Contingency Plan if there is a potential for a release of 100 ppm or greater of H2S at your facilities.

Please find attached a document that was shared with the Navajo Refining Company in preparation of their H2S Contingency Plan. Please find attached the H2S Regulations to review the requirements for your facilities. Also, a sample of an H2S Contingency Plan approved by the OCD that may be similar to that required at a refinery and may be found on OCD Online at http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx (GW-33).

Please submit your H2S Contingency Plan(s) to the OCD within 90 days of today's date (April 28, 2010). Please contact me if you wish to meet to discuss the contingency plan for your facilities. If you feel your facility does not meet the requirements of the regulations, please provide an explanation for our records.

Please contact me if you have questions or need further assistance. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Thursday, January 28, 2010 6:15 AM
To: 'Lackey, Johnny'
Subject: FW: H2S Contingency Plan Checklist.docx

Johnny:

Re: Refinery Hydrogen Sulfide Contingency Plan Requirements

It was a pleasure meeting with Navajo Refining Company Representatives yesterday to discuss the hydrogen sulfide contingency plan for your refineries. The OCD is working to ensure all facilities (including refineries) that may discharge H2S at concentrations greater than 100 ppm meet the NMOCD H2S Regulations. As you realized yesterday, the public training, meetings, etc. component of the H2S contingency plan is an extremely important component of a refinery contingency plan. As you indicated, refineries are a little different than a gas plant with raw gas containing H2S because a refinery produces H2S and can shut down or flare gas under emergency conditions. A Gas Plant handles raw gas that inherently contains a volume fraction of H2S with fewer controls than a refinery that produces it in its refining process.

Here is the checklist that Glen von Gonten was glad to provide and that you requested yesterday.

Disclaimer: Please be advised that the attached document is not an official guidance document from the OCD, but is provided to assist you with your evaluation of the New Mexico Hydrogen Sulfide Regulations Title 19 (Natural Resources and Wildlife), Chapter 15 [(Oil and Gas), and Part 11 (Hydrogen Sulfide Gas- 19.15.11 NMAC)].

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
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1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: VonGonten, Glenn, EMNRD
Sent: Wednesday, January 27, 2010 4:00 PM
To: Chavez, Carl J, EMNRD
Subject: H2S Plan Checklist.docx

Carl,

For Navajo.

Glenn

TITLE 19 NATURAL RESOURCES AND WILDLIFE
CHAPTER 15 OIL AND GAS
PART 11 HYDROGEN SULFIDE GAS

19.15.11.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.
[19.15.11.1 NMAC - N, 12/1/08]

19.15.11.2 SCOPE: 19.15.11 NMAC applies to a person subject to the division's jurisdiction, including a person engaged in drilling, stimulating, injecting into, completing, working over or producing an oil, gas or carbon dioxide well or a person engaged in gathering, transporting, storing, processing or refining of oil, gas or carbon dioxide. 19.15.11 NMAC does not exempt or otherwise excuse surface waste management facilities the division permits pursuant to 19.15.36 NMAC from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19.15.36 NMAC or more stringent conditions in permits issued pursuant to 19.15.36 NMAC, nor shall the facilities be exempt or otherwise excused from the requirements set forth in 19.15.11 NMAC by virtue of permitting under 19.15.36 NMAC.
[19.15.11.2 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.3 STATUTORY AUTHORITY: 19.15.11 NMAC is adopted pursuant to the Oil and Gas Act, NMSA 1978, Section 70-2-6, Section 70-2-11 and Section 70-2-12.
[19.15.11.3 NMAC - N, 12/1/08]

19.15.11.4 DURATION: Permanent.
[19.15.11.4 NMAC - N, 12/1/08]

19.15.11.5 EFFECTIVE DATE: December 1, 2008, unless a later date is cited at the end of a section.
[19.15.11.5 NMAC - N, 12/1/08]

19.15.11.6 OBJECTIVE: To require oil and gas operations be conducted in a manner that protects the public from exposure to hydrogen sulfide gas.
[19.15.11.6 NMAC - N, 12/1/08]

19.15.11.7 DEFINITIONS:

A. "ANSI" means the American national standards institute.

B. "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.

C. "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.

D. "Escape rate" means the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth in 19.15.11 NMAC.

(1) For existing gas facilities or operations, the escape rate is 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 is calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.

(2) For new gas operations or facilities, the escape rate is calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate is 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.

(3) For existing oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate of the maximum daily production rate.

(4) For new oil wells, the escape rate is 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.

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

E. "GPA" means the gas processors association.

F. "LEPC" means the local emergency planning committee established pursuant to the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. section 11001.

G. "NACE" means the national association of corrosion engineers.

H. "Potentially hazardous volume" means the volume of hydrogen sulfide gas of such concentration that:

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

(2) the 500-ppm radius of exposure includes a public road; or

(3) the 100-ppm radius of exposure exceeds 3000 feet.

I. "Public area" means a 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 a 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 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] present.

J. "Public road" means a federal, state, municipal or county road or highway.

K. "Radius of exposure" means the 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 the division may approve:

(1) for determining the 100-ppm radius of exposure: X = [(1.589)(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 psi absolute and 60 degrees fahrenheit);

(2) for determining the 500-ppm radius of exposure: X = [(0.4546)(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 psi absolute and 60 degrees fahrenheit);

(3) 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 3000 feet is assumed.
[19.15.11.7 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.8 REGULATORY THRESHOLD:
A. Determination of hydrogen sulfide concentration.

(1) Each person shall determine the hydrogen sulfide concentration in the gaseous mixture within 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 the person uses a representative sample or process knowledge, the concentration derived from the representative sample or process knowledge shall be reasonably representative of the hydrogen sulfide concentration within the well, facility or operation.

(2) The person shall conduct the tests used to make the determination referred to in Paragraph (1) of Subsection A of 19.15.11.8 NMAC in accordance with applicable ASTM or GPA standards or by another division-approved method.

(3) If the person conducted a test prior to January 31, 2003 that otherwise meets the requirements of Paragraphs (1) and (2) of Subsection A of 19.15.11.8 NMAC, new testing is not required.

(4) If a change or alteration may materially increase the hydrogen sulfide concentration in a well, facility or operation, the person shall make a new determination in accordance with 19.15.11 NMAC.

B. Concentrations determined to be below 100 ppm. If the hydrogen sulfide concentration in a given well, facility or operation is less than 100 ppm, the person is not required to take further actions pursuant to 19.15.11 NMAC.

C. Concentrations determined to be above 100 ppm.

(1) If the person determines the hydrogen sulfide concentration in a given well, facility or operation is 100 ppm or greater, then the person shall calculate the radius of exposure and comply with applicable requirements of 19.15.11 NMAC.

(2) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide results of the hydrogen sulfide concentration determination and the calculation of the radius of exposure to the division. For a well, facility or operation, the person shall accomplish the determination, calculation and submission 19.15.11.8 NMAC requires before operations begin.

D. Recalculation. The person 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 shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of 25 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 person shall provide the results to the division within 60 days.
[19.15.11.8 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.9 HYDROGEN SULFIDE CONTINGENCY PLAN:

A. When required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, the person shall develop a hydrogen sulfide contingency plan that the person will use to alert and protect the public in accordance with the Subsections B through I of 19.15.11.9 NMAC.

B. Plan contents.

(1) API guidelines. The person shall develop the hydrogen sulfide contingency plan with due consideration of paragraph 7.6 of the guidelines in the API publication 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 division-approved standard.

(2) Required contents. The hydrogen sulfide contingency plan shall contain information on the following subjects, as appropriate to the well, facility or operation to which it applies.

(a) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures the person will follow 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 Paragraph (1) of Subsection B of 19.15.11.9 NMAC, 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 road blocks and procedures for notifying the public, either through direct telephone notification using telephone number lists or by means of mass 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] notification and reaction plans. The plan shall include information on the availability and location of necessary safety equipment and supplies.

(b) 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.

(c) 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.

(d) 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 person will document the training, drills and attendance. 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.

(e) Coordination with state emergency plans. The hydrogen sulfide contingency plan shall describe how the person will coordinate emergency response actions under the plan with the division and the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan.

(f) 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.

C. Plan activation. The person shall activate the hydrogen sulfide contingency plan when a release creates a hydrogen sulfide concentration greater than the activation level set forth in the hydrogen sulfide contingency plan. At a minimum, the person shall activate the plan whenever a release may create a hydrogen sulfide concentration of more than 100 ppm in a public area, 500 ppm at a public road or 100 ppm 3000 feet from the site of release.

D. Submission.

(1) Where submitted. The person shall submit the hydrogen sulfide contingency plan to the division.

(2) When submitted. The person shall submit a hydrogen sulfide contingency plan for a new well, facility or operation before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation shall be on file with the division before operations commence and may be submitted separately or along with the APD or may be on file from a previous submission. A person shall submit a hydrogen sulfide contingency plan within 180 days after the person 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.

(3) Electronic submission. A filer who operates more than 100 wells or who operates an oil pump station, compressor station, refinery or gas plant shall submit each hydrogen sulfide contingency plan in electronic format. The file may submit the hydrogen sulfide contingency plan 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.

E. Failure to submit plan. A person's 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.

F. Review, amendment. The person 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 to add provisions to the plan or amend the plan as necessary to protect public safety.

G. 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 division inspection.

H. Annual inventory of contingency plans. On an annual basis, each person required to prepare one or more hydrogen sulfide contingency plans pursuant to 19.15.11 NMAC 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.

I. Plans required by other jurisdictions. The person may submit a hydrogen sulfide contingency plan to the BLM or other jurisdiction require that meets the requirements of 19.15.11.9 NMAC to the division in satisfaction of 19.15.11.9 NMAC.
[19.15.11.9 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.10 SIGNS, MARKERS: For each well, facility or operation involving a hydrogen sulfide concentration of 100 ppm or greater, the person shall install and maintain signs or markers that conform with the current ANSI standard Z535.1-2002 (Safety Color Code), or some other division-approved standard. The sign or marker shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. The person shall prominently post signs or markers at locations, including entrance points and road crossings, sufficient to alert the public that a potential danger exists.
[19.15.11.10 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.11 PROTECTION FROM HYDROGEN SULFIDE DURING DRILLING, COMPLETION, WORKOVER AND WELL SERVICING OPERATIONS:

A. API standards. The person shall conduct drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publications 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 Hydrogen Sulfide, RP-49, most recent editions, or some other division-approved standard.

B. Detection and monitoring equipment. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] concentration of 100 ppm or greater shall include hydrogen sulfide detection and monitoring equipment as follows.

(1) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the hydrogen sulfide's ambient air concentration reaches a predetermined value the operator sets, not to exceed 20 ppm. The operator shall locate a sensing point 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.

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

(3) The operator shall provide and maintain as operational hydrogen sulfide detection and monitoring equipment during drilling when

drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

C. Wind indicators. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. The person shall have equipment to indicate wind direction present and visible at all times. The person shall install at least two devices to indicate wind direction at separate elevations that visible from all principal working areas at all times. When a sustained hydrogen sulfide concentration is detected in excess of 20 ppm at a detection point, the person shall display red flags.

D. Flare system. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous hydrogen sulfide volume will be encountered, the person shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. The person shall locate flare outlets at least 150 feet from the well bore. Flare lines shall be as straight as practical. The person shall equip the flare system with a suitable and safe means of ignition. Where oncombustible gas is to be flared, the system shall provide supplemental fuel to maintain ignition.

E. Well control equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment is required.

(1) Drilling. The person shall install a remote-controlled well control system that is operational at all times beginning when drilling is within 500 vertical feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system shall 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 in API publications Choke and Kill Systems, 16C and Blowout Prevention Equipment Systems for Drilling Wells, RP 53 or other division-approved specifications. The person shall use mud-gas separators. The person

shall test and maintain these systems pursuant to the specifications referenced, according to the requirements of 19.15.11 NMAC, or as the division otherwise approves.

(2) Completion, workover and well servicing. The person shall install a remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other division-approved specifications that is operational at all times during a well's completion, workover and servicing.

F. Mud program. 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.

G. Well testing. except with prior division approval, a person shall conduct drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater only during daylight hours and not permit formation fluids to flow to the surface.

H. 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 shall satisfy the requirements of 19.15.11 NMAC before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that the operator has or is taking 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 a required hydrogen sulfide contingency plan. [19.15.11.11 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.12 PROTECTION FROM HYDROGEN SULFIDE AT OIL PUMP STATIONS, PRODUCING WELLS, TANK

BATTERIES AND ASSOCIATED PRODUCTION FACILITIES, PIPELINES, REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS:

A. API standards. A person shall conduct operations at oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, latest edition or some other division-approved standard.

B. Security. A person shall protect well sites and other unattended, fixed surface facilities involving a hydrogen sulfide concentration of 100 ppm or greater from public access by fencing with locking gates when the location is within 1/4 mile of a public area. For the purposes of Subsection B of 19.15.11.12 NMAC, a surface pipeline is not considered a fixed surface facility.

C. Wind direction indicators. Oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater shall have equipment to indicate wind direction. The person shall install wind direction equipment that is visible from all principal working areas at all times.

D. Control equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required.

(1) The person shall install and maintain in good operating condition safety devices, such as automatic shut-down devices, to prevent hydrogen sulfide's escape. Alternatively, the person shall establish safety procedures to achieve the same purpose.

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

E. Tanks or vessels. The person shall chain each stair or ladder leading to the top of a tank or vessel containing 300 ppm or more 19.15.11 NMAC http://www.nmcpr.state.nm.us/nmac/parts/title19/19.015.0011.htm[1/16/2009 4:18:08 PM] of hydrogen sulfide in the gaseous mixture or mark it to restrict entry. [19.15.11.12 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.13 PERSONNEL PROTECTION AND TRAINING: The person shall provide persons responsible for implementing a hydrogen sulfide contingency plan training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.
[19.15.11.13 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE: Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide's corrosive effects.
[19.15.11.14 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.15 EXEMPTIONS: A person may petition the director or the director's designee for an exemption to a requirement of 19.15.11 NMAC. A petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the person will protect public safety. 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 person protects public safety.
[19.15.11.15 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.16 NOTIFICATION OF THE DIVISION: The person 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 supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.
[19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

HISTORY of 19.15.11 NMAC:
History of Repealed Material: 19.15.3 NMAC, Drilling (filed 10/29/2001) repealed 12/1/08.
NMAC History:
That applicable portion of 19.15.3 NMAC, Drilling (Section 118) (filed 10/29/2001) was replaced by 19.15.11 NMAC, Hydrogen Sulfide Gas, effective 12/1/08.

TITLE 19 NATURAL RESOURCES AND WILDLIFE CHAPTER 15 OIL& GAS **PART 11 HYDROGEN SULFIDE GAS** **19.15.11.7 DEFINITIONS:**	
A. "ANSI" means the American national standards institute.	
B. "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.	
C. "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.	
D. "Escape rate" means the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth in 19.15.11 NMAC.	
(1) For existing gas facilities or operations, the escape rate is 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 is calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.	
(2) For new gas operations or facilities, the escape rate is calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate is 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.	
(3) For existing oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate of the maximum daily production rate.	
(4) For new oil wells, the escape rate is 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.	
(5) For facilities or operations not mentioned, the escape rate is calculated using the actual flow of the gaseous mixture through the system or the best estimate of the actual flow of the gaseous mixture through the system.	
E. "GPA" means the gas processors association.	
F. "LEPC" means the local emergency planning committee established pursuant to the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. section 11001.	
G. "NACE" means the national association of corrosion engineers.	
H. "Potentially hazardous volume" means the volume of hydrogen sulfide gas of such concentration that:	
(1) the 100-ppm radius of exposure includes a public area;	
(2) the 500-ppm radius of exposure includes a public road; or	
(3) the 100-ppm radius of exposure exceeds 3000 feet.	
I. "Public area" means a 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 a 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.	
J. "Public road" means a federal, state, municipal or county road or highway.	
K. "Radius of exposure" means the 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 the division may approve:	
(1) for determining the 100-ppm radius of exposure: X = [(1.589)(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 psi absolute and 60 degrees fahrenheit);	
(2) for determining the 500-ppm radius of exposure: X = [(0.4546)(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 psi absolute and 60 degrees fahrenheit);	
(3) 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 3000 feet is assumed.	
19.15.11.8 REGULATORY THRESHOLD:	
A. Determination of hydrogen sulfide concentration.	
(1) Each person shall determine the hydrogen sulfide concentration in the gaseous mixture by testing a sample from each well, facility or operation; testing a representative sample; or using process knowledge in lieu of testing.	
(2) The person shall conduct the tests in accordance with applicable ASTM or GPA standards or by another division-approved method.	
(3) If the person conducted a test prior to January 31, 2003 that otherwise meets the requirements of Paragraphs (1) and (2) of Subsection A of 19.15.11.8 NMAC, new testing is not required.	
(4) If a change or alteration occurs operators shall make a new determination	
B. Concentrations determined to be below 100 ppm. If less than 100 ppm, the person is not required to take further actions pursuant to 19.15.11 NMAC.	
C. Concentrations determined to be above 100 ppm.	
(1) If the person determines the hydrogen sulfide concentration in a given well, facility or operation is 100 ppm or greater, then the person shall calculate the radius of exposure and comply with applicable requirements of 19.15.11 NMAC.	
(2) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide results of the hydrogen sulfide concentration determination and the calculation of	

the radius of exposure to the division. For a well, facility or operation, the person shall accomplish the determination, calculation and submission 19.15.11.8 NMAC requires before operations begin.	
D. Recalculation. The person 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 shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of 25 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 person shall provide the results to the division within 60 days.	
19.15.11.9 HYDROGEN SULFIDE CONTINGENCY PLAN:	
A. When required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, the person shall develop a hydrogen sulfide contingency plan that the person will use to alert and protect the public in accordance with the Subsections B through I of 19.15.11.9 NMAC. B. Plan contents.	
(1) API guidelines. The person shall develop the hydrogen sulfide contingency plan with due consideration of paragraph 7.6 of the guidelines in the API publication 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 division-approved standard.	
(2) Required contents. The hydrogen sulfide contingency plan shall contain information on the following subjects, as appropriate to the well, facility or operation to which it applies.	
(a) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures the person will follow 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 Paragraph (1) of Subsection B of 19.15.11.9 NMAC, 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 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.	
(b) 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.	
(c) 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.	
(d) 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 person will document the training, drills and attendance. 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.	

(e) Coordination with state emergency plans. The hydrogen sulfide contingency plan shall describe how the person will coordinate emergency response actions under the plan with the division and the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan.	
(f) 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.	
C. Plan activation. The person shall activate the hydrogen sulfide contingency plan when a release creates a hydrogen sulfide concentration greater than the activation level set forth in the hydrogen sulfide contingency plan. At a minimum, the person shall activate the plan whenever a release may create a hydrogen sulfide concentration of more than 100 ppm in a public area, 500 ppm at a public road or 100 ppm 3000 feet from the site of release.	
D. Submission.	
(1) Where submitted. The person shall submit the hydrogen sulfide contingency plan to the division.	
(2) When submitted. The person shall submit a hydrogen sulfide contingency plan for a new well, facility or operation before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation shall be on file with the division before operations commence and may be submitted separately or along with the APD or may be on file from a previous submission. A person shall submit a hydrogen sulfide contingency plan within 180 days after the person 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.	
(3) Electronic submission. A filer who operates more than 100 wells or who operates an oil pump station, compressor station, refinery or gas plant shall submit each hydrogen sulfide contingency plan in electronic format. The file may submit the hydrogen sulfide contingency plan 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.	
E. Failure to submit plan. A person's 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.	
F. Review, amendment. The person 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 to add provisions to the plan or amend the plan as necessary to protect public safety.	
G. 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 division inspection.	
H. Annual inventory of contingency plans. On an annual basis, each person required to prepare one or more hydrogen sulfide contingency plans pursuant to 19.15.11 NMAC 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.	
I. Plans required by other jurisdictions. The person may submit a hydrogen sulfide contingency plan the BLM or other jurisdiction require that meets the requirements of 19.15.11.9 NMAC to the division in satisfaction of 19.15.11.9 NMAC.	
19.15.11.10 SIGNS, MARKERS:	
For each well, facility or operation involving a hydrogen sulfide concentration of 100 ppm or greater, the person shall install and maintain signs or markers that conform with the current ANSI standard Z535.1-2002 (Safety Color Code), or some other division-approved standard. The sign or marker shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. The person shall prominently post signs or markers at locations, including entrance points and road crossings, sufficient to alert the public that a potential danger exists.	
19.15.11.11 PROTECTION FROM HYDROGEN SULFIDE DURING DRILLING; COMPLETION, WORKOVER AND WELL SERVICING OPERATIONS:	
A. API standards. The person shall conduct drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publications 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 Hydrogen Sulfide, RP-49, most recent editions, or some other division-approved standard.	
B. 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.	
(1) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the hydrogen sulfide's ambient air concentration reaches a predetermined value the operator sets, not to exceed 20 ppm. The operator shall locate a sensing point 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.	
(2) For workover and well servicing operations, the person shall locate one operational sensing point as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.	
(3) The operator shall provide and maintain as operational hydrogen sulfide detection and monitoring equipment during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.	
C. Wind indicators. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. The person shall have equipment to indicate wind direction present and visible at all times. The person shall install at least two devices to indicate wind direction at separate elevations that visible from all principal working areas at all times. When a sustained hydrogen sulfide concentration is detected in excess of 20 ppm at a	

detection point, the person shall display red flags.	
D. Flare system. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous hydrogen sulfide volume will be encountered, the person shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. The person shall locate flare outlets at least 150 feet from the well bore. Flare lines shall be as straight as practical. The person shall equip the flare system with a suitable and safe means of ignition. Where noncombustible gas is to be flared, the system shall provide supplemental fuel to maintain ignition.	
E. Well control equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment is required.	
(1) Drilling. The person shall install a remote-controlled well control system that is operational at all times beginning when drilling is within 500 vertical feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system shall 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 in API publications Choke and Kill Systems, 16C and Blowout Prevention Equipment Systems for Drilling Wells, RP 53 or other division-approved specifications. The person shall use mud-gas separators. The person shall test and maintain these systems pursuant to the specifications referenced, according to the requirements of 19.15.11 NMAC, or as the division otherwise approves.	
(2) Completion, workover and well servicing. The person shall install a remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other division-approved specifications that is operational at all times during a well's completion, workover and servicing.	
F. Mud program. 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.	
G. Well testing. Except with prior division approval, a person shall conduct drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater only during daylight hours and not permit formation fluids to flow to the surface.	
H. 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 shall satisfy the requirements of 19.15.11 NMAC before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that the operator has or is taking 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 a required hydrogen sulfide contingency plan.	
19.15.11.12 PROTECTION FROM HYDROGEN SULFIDE AT OIL PUMP STATIONS, PRODUCING WELLS, TANK BATTERIES AND ASSOCIATED PRODUCTION FACILITIES, PIPELINES, REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS:	
A. API standards. A person shall conduct operations at oil pump stations and producing wells, tank	

batteries and associated production facilities, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, latest edition or some other division-approved standard.	
B. Security. A person shall protect well sites and other unattended, fixed surface facilities involving a hydrogen sulfide concentration of 100 ppm or greater from public access by fencing with locking gates when the location is within 1/4 mile of a public area. For the purposes of Subsection B of 19.15.11.12 NMAC, a surface pipeline is not considered a fixed surface facility.	
C. Wind direction indicators. Oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater shall have equipment to indicate wind direction. The person shall install wind direction equipment that is visible from all principal working areas at all times.	
D. Control equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required.	
(1) The person shall install and maintain in good operating condition safety devices, such as automatic shut-down devices, to prevent hydrogen sulfide's escape. Alternatively, the person shall establish safety procedures to achieve the same purpose.	
(2) A well shall possess a secondary means of immediate well control through the use of an appropriate Christmas tree or down hole completion equipment. The equipment shall allow downhole accessibility (reentry) under pressure for permanent well control. E. Tanks or vessels. The person shall chain each stair or ladder leading to the top of a tank or vessel containing 300 ppm or more of hydrogen sulfide in the gaseous mixture or mark it to restrict entry.	
19.15.11.13 PERSONNEL PROTECTION AND TRAINING:	
The person shall provide persons responsible for implementing a hydrogen sulfide contingency plan training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.	
19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE:	
Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide's corrosive effects.	
19.15.11.15 EXEMPTIONS:	
A person may petition the director or the director's designee for an exemption to a requirement of 19.15.11 NMAC. A petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the person will protect public safety. 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 person protects public safety.	
19.15.11.16 NOTIFICATION OF THE DIVISION:	
The person 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 supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.	
C-108 REQUIREMENTS	
XIV. PROOF OF NOTICE All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location. Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located.	
OTHER ISSUES - GW033	
OTHER ISSUES - BHP COAL MINE	