HYDROGEN SULFIDE CONTINGENCY PLAN

Revised October 2023

AMEREDEV

Independence Gas Gathering System

Trinity Consultants

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. OVERVIEW

1.1 Purpose

Pursuant to 19.15.11.9 NMAC, this written Hydrogen Sulfide (H_2S) Contingency Plan (the Plan) has been prepared for Ameredev Operating, LLC (Ameredev) to outline procedures that will alert and protect personnel and the public in the event an H_2S release occurs. The response plan applies to the Independence Gas Gathering System.

1.2 Scope

The Plan includes information on H_2S and its dangers, emergency procedures and contact information for emergency officials, state and local agencies, vendors, and area residents, as well as training requirements.

The Plan should be implemented prior to operations and should be reviewed before performing any duties within the radius of exposure. It is the responsibility of each affected Ameredev employee to be thoroughly familiar with the Plan, and, in accordance with the Plan, coordinate his or her efforts in response to an emergency involving H_2S.

The Plan will be activated prior to an intentional release, or immediately upon the detection of an accidental release of a potentially hazardous volume of H_2S (as defined below). Intentional H_2S releases may include planned maintenance of the pipelines, required releases in response to an emergency, and/or decommissioning of an H_2S-containing facility. All intentional release operations shall be performed with safety as the primary goal with a focus on minimizing the released volumes and impacts to the environment as well. Per 19.15.11.7.H NMAC, a potentially hazardous volume of hydrogen sulfide gas is defined as follows:

1. 100-ppm if the radius of exposure includes a public area; or
2. 500-ppm if the radius of exposure includes a public road; or
3. 100-ppm if the radius of exposure extends to 3,000 feet from the site of release.

As with all Ameredev response plans, the primary considerations in its development are first to personnel and public safety, second to the protection of Ameredev and public property and third to the protection of the environment.

In the event of a release involving H_2S, the priority of actions is as follows:

1. Preserve life,
2. Protect public property,
3. Protect Ameredev property,
4. Notify supervisor,
5. Control scene, and
6. Isolate/maintain/restore operations.

1.3 Plan Component Overview

1.3.1 System Description Summary

Section 9, System Information and Maps, includes the information for each system which contains H_2S gas. A "system" may consist of:

- Wells
- Pipelines
- Flowlines
- Processing plants
- Compressor stations
- Any other associated facilities which are connected to sour gas production, processing, or transportation

This plan applies to Ameredev's Independence Gas Gathering System (pipeline), not to individual facilities. Individual facilities will have their own plans.

1.3.2 Leak Prevention and Safety Systems Summary

The Independence Gas Gathering System (the System) handles natural gas with H_2S concentrations of 100 ppm or more. Monitoring techniques and procedures include, but are not limited to, visual observation and portable leak detection equipment. The System is routinely monitored by field personnel who have been trained to detect leaks. Process monitoring devices, such as pressure and flow rate sensors, are monitored to determine if a condition which requires corrective action exists. The system is monitored continuously via a supervisory control and data acquisition (SCADA) monitoring system.

Block valves, able to isolate portions of each pipeline, are located throughout the System. Pressure relief valves/ flares are installed and maintained in operable conditions throughout the production facilities feeding the pipeline system as safety devices to avoid over-pressurization of the pipeline. Ameredev plans to perform monthly right-of-way inspections and leak detection surveys at pipeline risers to proactively identify and fix issues in order to maintain the integrity of the pipeline. If repairs or replacements are needed as identified during the inspections; they will be made immediately or as soon as feasible.

The System has been designed and constructed with additional safety systems to provide for the safe operations of an H_2S system. The safety equipment shall include:

- Block valves to isolate portions of the pipeline
- Pressure relief/ flares at production facilities along the pipeline system
- Remote real-time SCADA data monitoring (pressure & flow rates)
- H2S monitoring system equipped with audible-visual beacons & wind socks located at production facilities

In addition to the system monitoring, Ameredev will inspect self-contained breathing apparatuses (SCBAs), air supply systems, escape packs, and fire extinguishers at facilties on a monthly basis. Inspections will be completed by a qualified individual to ensure the equipment is in an operable condition.

For a detailed list of all safety systems on each pipeline segment, refer to Section 9, System Information and Maps for the Independence Gas Gathering System.

1.3.3 Radius of Exposure Summary

The 100 parts per million (ppm) radius of exposure (ROE) for H_2S for the System, 19.15.11.7.K NMAC, is the distance surrounding the System where the concentration of 100 ppm H_2S will remain at a constant level for a 24-hour period by way of continuous emission. The 500 ppm ROE for H_2S is the distance surrounding the System where the concentration of 500 ppm H_2S will remain at a constant level for a 24-hour period by way of continuous emission.

For possible releases of H_2S gas from the System, worst-case scenario gas escape rates were determined based on the maximum daily volume rate of gas containing H_2S handled by the System element for which the ROE was calculated. Pursuant to 19.15.11.7.K(1) and 19.15.11.7.K(2) NMAC, the worst-case scenario gas escape rate and H_2S concentration for each System element were used in conjunction with the Pasquil-Gifford equation to calculate the 500 ppm and 100 ppm ROEs.

The Pasquil-Gifford Equation was used as follows:

$$100\ ppm\ ROE = X = [(1.589)[H_2S](Q)]^{0.6258}$$

$$500\ ppm\ ROE = X = [(0.4546)[H_2S](Q)]^{0.6258}$$

Where,

X = Radius of exposure in feet
Q = The escape rate, or maximum volume determined to be available for escape per day, corrected to standard conditions of 14.73 pounds per square inch (psia) and 60 degrees Fahrenheit, expressed as cubic feet per day
[H_2S] = Hydrogen sulfide concentration, or mole fraction of H_2S in the gaseous mixture available for escape

1.3.4 Maps Summary

Functional maps, which detail the area of exposure of H_2S and the locations of private dwellings, residential areas, and public facilities such as schools, business locations, public roads, or other similar areas where the public might reasonably be expected within the area of exposure, have been created for the System. If applicable, maps or diagrams which detail evacuation routes and the locations of traffic control points (TCPs), have been developed to facilitate the use of the Plan. Maps and diagrams are provided, as applicable, in Section 9, System Information and Maps.

1.3.5 Emergency Contact Lists Summary

Emergency contact lists have been developed and include names and phone numbers for Ameredev personnel, contractors and vendors, public safety groups, emergency medical support, and regulatory agencies, as well as the names, phone numbers, and locations of the public in residential or otherwise public areas. These lists should be referred to in the case of an H_2S-related emergency, leak, or intentional release of H_2S in potentially hazardous quantities. Emergency contact lists are provided, as applicable, in Appendix B, Emergency Notification Call Lists. Ameredev will review this information on an annual basis to ensure the information is current and correct.

1.3.6 Public Inventory Summary

A public assessment has been conducted within the 500 ppm ROE for the System to identify public roads, including any federal, state, county, or municipal street or road owned or maintained for public use, located in the 500-ppm area of exposure. Maps summarizing the public roads which traverse the 500-ppm area of exposure have been provided, as applicable, in Section 9, System Information and Maps.

A public assessment has been conducted within the 100 ppm ROE to identify affected public areas in the 100-ppm area of exposure. Public areas are also referred to as public receptors and include dwellings, places of business, churches, hospitals, schools, libraries, bus stops, government buildings, public roads, parks, cities, towns, villages, or other similar areas. Names, contact numbers, and location information for the public receptors located in the 100-ppm area of exposure were obtained. The map(s) and/or notification list(s) containing the information obtained from/about the public receptors in the 100-ppm area of exposure are provided in Section 9, System Information and Maps, and Appendix B, Emergency Notification Call Lists.

During an emergency situation and/or if a threat to life or property is determined, door-to-door, direct contact will be attempted by an Ameredev employee or a trained contract employee, for all identified public receptors. When direct contact is made, a short briefing on the following topics is discussed:

- Description of Ameredev's safety systems and practices,
- How to recognize a gas leak,
- Characteristics and sources of H_2S and associated hazards,
- Location of Ameredev H_2S operations in relation to their location,
- Instructions for reporting a gas leak and Ameredev's Emergency Telephone number,
- Means of notification of the general public in the event of an emergency,
- Steps to take in case of an emergency,
- Advise if they suspect something wrong, to move upwind and away from the operation and notify Ameredev and Public Safety Officials immediately.

1.3.7 General H_2S Briefing and Response Procedure Summary

The Plan includes instructions and procedures for alerting the general public and public safety personnel of the existence of an emergency, procedure for requesting assistance and for follow-up action to remove the public from the area of exposure, and training requirements and procedures. The Plan contains the following elements:

- Characteristics and hazards of H_2S and SO_2,
- Need for an emergency action plan,
- Possible sources of H_2S in the area of exposure,
- Instructions for reporting a gas leak,
- Manner in which the public will be notified of an emergency, and
- Steps to be taken in an emergency.

2. AVAILABILITY AND ACCURACY OF PLAN

2.1 Plan Availability

The Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. The Plan is retained at the location, listed below:

Ameredev Operating, LLC
2901 Via Fortuna
Ste 600
Austin, TX 78746

A copy of the plan will be distributed to the following agencies:

- New Mexico Oil Conservation Division (OCD)
- Local emergency response organizations, such as the local fire department

(Refer to Appendix B, Emergency Notification Call Lists for appropriate contact information)

2.2 Plan Review and Revision

The Plan shall be reviewed at least annually and shall be updated when provisions or coverage changes. The Plan shall be kept updated to ensure its current applicability. Changes to the Plan shall be recorded on the Contingency Plan Revision Log.

2.2.1 Annual Inventory

On an annual basis, Ameredev shall file with the appropriate local emergency planning committee (LEPC) for Lea County, NM and the NM State Emergency Response Commission (SERC) an inventory of the wells, facilities, pipelines/gas gathering systems, and operations for which plans are on file with the division and the name, address and telephone number of a point of contact. (Refer to Appendix B, Emergency Notification Call Lists for appropriate contact information).

3. TRAINING AND PUBLIC EDUCATION PROGRAM

3.1 Operator Training Program

As noted below, all essential personnel shall be H_2S-trained and fit tested before operations begin.

Every person working in any capacity on the System shall review the Contingency Plan and emergency procedures and shall participate in the outlined training program.

Ameredev operations personnel working in H_2S areas (areas within the 100 ppm ROE) shall receive the training at the intervals listed below to ensure they are prepared to respond to an H_2S emergency:

- H_2S Safety - Annually
  - Hazards and characteristics of H_2S and SO_2
  - Physical effects of H_2S and SO_2
  - First Aid Procedures for overexposure
  - Use of self-contained breathing apparatus (SCBA) - as required
  - Safe work practices
  - Effects of H_2S on metals
  - H_2S Contingency Plan
- Respiratory Protection - as indicated by equipment
- Hazard Communication - Annually
- Emergency Plan - Annually or whenever there is a significant change
- Cardiopulmonary Resuscitation (CPR) - Annually
- First Aid - Every two (2) years

3.1.1 Operations Personnel

Ameredev operations personnel receive training in the following subjects to ensure their safety, the safety of others, and proper emergency response action:

- Hazards, characteristics, and properties of H_2S and SO_2
- Sources of H_2S and SO_2
- Proper use of H_2S and SO_2 detection systems used by the System
- Recognition of and proper response to the warning signals for H_2S and SO_2 detection systems used by the System
- Symptoms of H_2S exposure and symptoms of SO_2 exposure
- Rescue techniques and first aid to victims of H_2S and SO_2 exposure
- Proper use and maintenance of breathing equipment for working in an H_2S and SO_2 atmosphere (theory and hands-on practice, with demonstrated proficiency)
- Safety precautions, procedures and safe work practices and relevant maintenance procedures that have been established to protect personnel from the hazards of H_2S and SO_2
- Corrective actions and shut down procedures that have been established to mitigate the effects of H_2S and SO_2 in an emergency
- Wind direction awareness and routes of egress
- Confined space and enclosed facility entry procedures
- Emergency response procedures for the System, as outlined in this Contingency Plan
- Locations and operation of safety equipment, as outlined in this Contingency Plan
- Locations of emergency assembly areas, if so designated, as outlined in this Contingency Plan

3.1.2 Supervisory Personnel

Supervisory personnel receive additional training in the following subjects:

- Supervisory responsibilities of the H_2S Contingency Plan, its activation, implementation, and contents.
- Effects of H_2S system components, including, but not limited to, corrosion, embrittlement, and H_2S stress cracking; and
- Corrective actions & shutdown procedures.

On-site supervisory personnel must also have full knowledge of the requirements of the Contingency Plan when the Plan is required.

3.1.3 Service Company Personnel

Ameredev shall require all service companies working in affected areas to utilize only those service company personnel who have been properly trained in the hazards and characteristics of H_2S, safety precautions, and the operation of safety equipment and life support systems. For supervisory personnel, training shall include the effect of H_2S on metal components, corrective actions & shutdown procedures, blowout prevention, and well control procedures. Supervisory personnel of contractors and service companies must also have full knowledge of the Plan when the Plan is required.

3.1.4 Hydrogen Sulfide and Sulfur Dioxide Training and Drills

In addition to the training programs outlined above, quaterly emergency drills shall be held. Monthly drills involve a simulated emergency environment where every personnel shall be gathered at the designated muster area.

3.1.4.1 Responsibilities and Duties of Essential Personnel

Personnel responsible for implementing the Plan shall be trained on their duties and responsibilities related to this Plan during the annual on-site training exercises. All personnel, visitors, and contractors must attend an overview orientation prior to obtaining permission to conduct work. A refresher course on this training is required annually for all persons.

3.1.4.2 On-site or Classroom Drills

Ameredev uses tabletop exercises, such as in-classroom training, as well as hands-on emergency response training methods.

3.1.4.3 Notification and Training of Others on Protective Measures in Emergency Situations

At the time of submission, there are no residences within the 100 ppm ROE. Nearby residents who live outside of the ROE and companies within the ROE will be invited to participate in and/or observe annual drills where they will be briefed on notification, evacuation, and shelter in place options.

3.1.4.4 Briefing of Public Officials on Evacuation and Shelter in Place Plans

Local law enforcement, first responders, and fire personnel will also be invited to participate and/or observe annual drills, as well as being briefed on notification, evacuation, and shelter in place plans.

3.2 Liaison with Public Officials

In the event of an emergency, governmental, volunteer, and public safety personnel shall be briefed in areas where H_2S may exist. Public Safety personnel shall be briefed on the following information prior to any emergency on an annual:

- The Contingency Plan and the "Radius of Exposure" emphasize portions within any public areas.
- Ameredev's capabilities and resources for coping with an accidental release of H_2S.
- Availability of instruments for measuring H_2S content within affected areas.
- Availability of personnel to assist in informing and evacuating any persons in the affected area.
- Availability of two-way communications with mobile phones and radios.
- Verification of telephone numbers of people who can be contacted at all times in the event the Contingency Plan must be implemented.
- Methods in which Ameredev personnel can be contacted at all times.
- Preferred routes and methods of evacuation and the establishment of roadblocks.
- Concept of and procedures for Shelter-in-Place.
- Methods of establishing and maintaining communications between Ameredev and emergency personnel during the operations.
- Ameredev's emergency telephone numbers.
- Hazards of H_2S and SO_2.

3.3 Public Education

At the time of submission of this plan, there are four(4) public impact points (PIP) within the 100 ppm ROE. The public within the 100-ppm radius of exposure (see Table 3-1) will be briefed semiannually, in person by an Ameredev, or Ameredev-trained representative, or through directed mailings, and will be provided with the following information:

- Hazards and characteristics of H_2S and SO_2.
- Location of Ameredev's H_2S operations in relation to their location.
- Ameredev's emergency telephone numbers.
- Preferred routes and methods of evacuation from their particular location.
- Concept of and procedures for Shelter-in-Place.

Additionally, Ameredev shall obtain contact information and plot location of residences/businesses on ROE maps.

The public will be advised that if they suspect something wrong, the immediate response should be to move upwind and away from the operation and notify Ameredev and Public Safety Officials immediately.

Table 3-1: List of public impact points within 100 ppm ROE

PIP ID	Address/GPS (NAD 83)	Phone Number
1	Ameredev Operating Portable Field Office 32.146313°, -103.245624°	Ameredev Control Room (512) 364-8569
2	Global Water Solutions Portable Field Office 32.136268°, -103.280603°	Donnie Hill (575) 390-1207

PIP ID	Address/GPS (NAD 83)	Phone Number
3	Intrepid Potash-New Mexico LLC 32.0524876°, -103.26168°	Head Office: (303) 296-3006

3.4 Training and Attendance Documentation

All training and drills will be documented. Documentation shall include sign-in sheets, summary of the training conducted, and an after-action review of the training. Appropriate records will be retained for a minimum of five (5) years.

4. CHARACTERISTICS OF HYDROGEN SULFIDE AND SULFUR DIOXIDE

4.1 Hydrogen Sulfide

4.1.1 Physical Properties

Refer to Appendix C for the National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards of Hydrogen Sulfide, which includes the physical properties of H_2S.

4.1.2 Chemical Properties

- Burns with a blue flame and produces sulfur dioxide (SO_2), a gas that has a very irritating effect on eyes and lungs.
- H_2S attacks most metals, especially in the presence of water, forming sulfides that are usually insoluble precipitates. Corrosive to plastics, tissue, and nerves.
- The reaction of H_2S with soluble metal salts produces insoluble sulfide precipitates. The reaction of H_2S with lead acetate produces a dark brown precipitate (lead sulfide) used in its identification.
- H_2S dissolves in water forming a weak acid (hydro sulfurous acid).

4.1.3 Physical Effects

Refer to Appendix C for the Occupational Safety and Health Administration's (OSHA) Health Hazards of Hydrogen Sulfide.

4.1.4 Subjective Odor Responses

Table 4-1. Subjective Odor Responses

Concentration (ppm)	Effects
0.02	No odor
0.13	Minimal perceptible odor
0.77	Faint but readily perceptible odor
4.60	Easily detectable, moderate odor
27.00	Strong, unpleasant odor, but not intolerable
30.00	Odor does not appear stronger as concentration increases

CAUTION:
H_2S can paralyze the sense of smell.
Do not use odor to detect H_2S.

4.1.5 Associated Terminology

Hydrogen Sulfide may also be referred to as:

- Acid Gas
- H_2S
- Hydro sulfuric Acid
- Poison Gas
- Rotten Egg Gas
- Sewer Gas
- Sour Gas
- Stink Damp
- Sulfur Gas
- Sulfur Hydride
- Sulfurate Hydrogen

4.2 Sulfur Dioxide

4.2.1 Physical Properties

Refer to Appendix D for the National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards of Sulfur Dioxide, which includes the physical properties of SO_2.

4.2.2 Chemical Properties

- There is no natural SO_2 content in the handled gas.
- SO_2 will only occur if the gas stream is ignited, combusted, or burned.
- Ignition would occur only during a maximum upset condition, which has been demonstrated as being very improbable.
- Jet momentum of the escaping gas will effectively vertically disperse any SO_2 resulting from an ignition.
- The thermal effect from ignition will create additional upward buoyancy and aid in dispersion.
- Because SO_2 is an irritant, it acts as a self-alarming gas.

4.2.3 Physical Effects

Table 4-2. Sulfur Dioxide Physical Effects

Refer to Appendix D for the National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards of Sulfur Dioxide, which includes the effects properties of SO_2 exposure.

4.2.4 Associated Terminology

Sulfur Dioxide may commonly be referred to as:

- SO_2
- Bisulfite
- Sulfurous acid anhydride
- Sulfurous oxide
- Sulfur oxide

5. EMERGENCY NOTIFICATION PROCEDURE

Emergency response procedures outlined in this Plan are in accordance with Ameredev's Emergency Response Plan. This Plan applies only to the Independence Gas Gathering System outside of specific facilities. Each facility owned or operated by Ameredev has its own H_2S Contingency Plan.

5.1 On-Site Emergency Detection & Monitoring Systems

- System is equipped with an onsite safety system with real time data monitoring and notification devices.
- In particular areas, such as within operating facilities, real-time data is monitored by an industry-standard Supervisory Control and Data Acquisition (SCADA) System that will detect certain out of range data that could indicate a potential problem.
- Should the onsite safety system receive any real time data that would indicate a potential problem, it will activate the audio and visual alarms.

5.2 Emergency Communications

The following means will be utilized to establish communication:

- Telephone
- Cellular phone

5.3 Call and Notification Lists

Lists have been developed and are included, as applicable, in Appendix B, Emergency Notification Call Lists, of this Plan for the following groups:

- Ameredev Responders/Personnel
- Emergency Medical Services
- Public Safety Groups
- Regulatory Agencies
- Contractors & Service Companies
- General Public Within Area of Influence

Notifications to the groups listed above will be made by the Leak Site Coordinator, or his/her designee, via telephone call or direct contact. The Sheriff and/or Highway Patrol will assist in telephone or direct notifications as needed.

5.4 General Public

Upon notification by telephone call or direct responder contact, the general public should perform the following actions, if an evacuation is not deemed appropriate:

- Shelter-in-Place:
  - Go inside and stay inside;
  - Close doors and windows;

- Turn off heat or air conditioning,
- Do not use the telephone (Leave Phone Lines Open for Emergencies)

The general public will be notified by telephone call or direct responder contact when it is safe to resume normal activities. (Refer to Section 8.2, Shelter-in-Place Procedure)

- If evacuation is initiated, report to the public relocation assignment points as instructed during notification, for relocation procedures.

6. EMERGENCY RESPONSE ROLES AND RESPONSIBILITIES

To ensure notification of all responders and the general public of a potential problem, the following notification procedure & roles have been established.

6.1 Operations Management

- Shall provide visible leadership to ensure that all H_2S-related training, policies, and procedures are fully implemented.

6.2 Supervisory Personnel

- Shall activate and implement the H_2S Contingency Plan immediately upon notification of an actual or potential leak or other H_2S-related emergency, or prior to a planned release of H_2S in potentially hazardous volumes (H_2S-related event).
- Must notify the New Mexico Environment Department (NMED) District 3 Office (Las Cruces) and New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD), Oil Conservation Division (OCD) of the H_2S- related event.

6.3 Leak Control Coordinator

- Take steps to establish a command and communication base.
- Determine wind direction.
- Notify Chief Operating Officer and supervisory personnel in the field immediately.
- Determine by use of any means, location of on-duty personnel.
- Dispatch available Ameredev personnel to suspected leak site area.
- Alert Emergency Response Personnel in the area of the potential problem and request stand-by assistance.
- Make initial determination of public potentially exposed in the Leak Affected Area (LAA), which is the same as the ROE, and take steps for notification and Shelter-in-Place or evacuation, coordinating with local emergency officials.
- Appoint Ameredev Employee Most Likely to Be First On-Scene as Leak Site Coordinator.
- Upon receiving the first report from Leak Site Coordinator, make decision on degree of potential danger, isolate area and Shelter-in-Place or evacuate.
- Notify residents within affected area. See Affected Public Contact List in Appendix B.
- Secure support of Public Safety Groups.
- Standby to support the Leak Site Coordinator until the situation is secure.

6.4 Leak Site Coordinator

- The highest ranking Ameredev Employee On-Scene shall assume role of Leak Site
- Coordinator. Upon arrival at the scene, determine approximate location of leak and degree
- of danger. Determine existence of public in critical area and Shelter-in-Place or evacuate.
- Secure any medical assistance needed.
- Take steps to shut off the gas supply.
- Determine the status of available resources.
- Determine if additional evacuation or isolation is needed.
- Report needs to Leak Control Coordinator and request required Public Safety support.

- Proceed to leak site and assess situation.
- Determine if leak can or should be ignited to protect public.
- Proceed to ignite leak if determined necessary.
- Make a secondary evaluation of the situation.
- Proceed with the best plan (at the time) as conditions dictate until the situation is secure.
- After the initial crisis is over, organize a Field Investigation Team. Get complete information regarding any public effects because of the leak.

6.5 Operating Personnel

- Upon call from Leak Control Coordinator, report your position, and respond as requested.
- Equip your personal safety equipment.
- At leak site area, report to Leak Site Coordinator and follow his/her instructions.
- The chain of command is through the Leak Site Coordinator. Take no action other than per his/her direction.

6.5.1 Essential Personnel

Essential personnel, or individuals required to provide proper and prudent safe operations activities and those required to affect control of the hazardous H_2S and/or SO_2 conditions.

- Shall be familiar with H_2S safety requirements, protocol, and procedures for their work areas.
- Shall be familiar with the location and proper use of H_2S detection and respiratory equipment and first aid procedures.
- Shall be responsible for maintaining personal safety equipment.
- Shall report to Leak Control Coordinator in the event of an H_2S-related event and follow his/her instructions; no action is to be taken unless directed by Leak Control Coordinator.

6.5.2 Non-Essential Personnel

- Those individuals who are NOT classified as Essential Personnel.
- Shall be familiar with H_2S safety requirements, protocol, and procedures for their work areas.
- Shall be familiar with the location and proper use of respiratory and first aid equipment.
- Shall be familiar with Shelter-in-Place and evacuation procedures.

6.6 Field Investigation Team

- Shall obtain information regarding possible effects of H_2S on the public following the H_2S-related event.

6.7 Vendor Support Resources

Vendor support resources will be utilized to support Plan implementation as needed. A listing of vendors has been developed and included in Appendix B of the Plan.

6.8 H_2S Safety Support Resources

Pre-selected H_2S Safety Support Resources, if used, will report to a Ameredev Representative and dispatch all available personnel to the facility with prearranged equipment, and perform the following functions as needed:

- Provide a qualified individual who would function as an onsite safety officer.
- Support with safe perimeter establishment.
- Support at leak site during control activities.
- Support the evacuation of the general public, if the decision for such is made.

6.9 24-Hour (Emergency) Answering Service

- Must answer all phone calls to the 24-hour emergency number 24 hours per day, seven (7) days per week; the line should **NEVER** be left unattended.
- May accept collect calls from individuals reporting possible danger or suspected leak problems from an Ameredev facility.
- Shall complete the Leak Report Log and, when taking a call from an individual who suspects that he/she may be in danger, advise the caller to move upwind and away from the area of the suspected leak, making sure to avoid low lying areas, and eliminate ignition sources.
- Shall notify the appropriate individuals immediately after the report of a leak or imminent danger is received and all required information has been obtained from the caller.
- Shall maintain a complete log of all communications with the general public, public safety personnel, emergency response teams, and field personnel.
- Shall assist field personnel with necessary communications and support contacts.

6.10 Public Safety Groups

The following emergency procedures should be followed by Public Safety Groups:

1. Upon notification of a leak, Public Safety Officials should dispatch personnel to the predetermined staging area (if necessary).
2. The alerted Public Safety Personnel should divide into traffic control teams and evacuation teams (if necessary).
3. Based upon the safe area perimeter and Leak Affected Areas (LAAs) determined by the Leak Site Coordinator, Public Safety Personnel should be dispatched to the traffic control points. (Predetermined traffic control points (TCPs), if any, are shown in Section 9, System Information and Maps.) Public Safety Personnel should prevent any unauthorized parties from entering the Radius of Exposure and direct evacuating public along the pre-determined evacuation routes to public relocation assignment points.
4. Other Public Safety Personnel should stand on alert to evacuate affected parties should the Leak Control Coordinator decide to evacuate.
    a. If needed, they will initiate evacuation, starting with the public nearest to the leak site.
    b. The public will be directed according to predetermined evacuation routes to public relocation assignment points.
    c. Public Safety Group will canvas the area to ensure that all members of the general public in the selected Leak Effected Areas have been evacuated.

PUBLIC SAFETY PERSONNEL WILL NOT BE DIRECTED INTO ANY HAZARDOUS AREAS.

6.11 Visitors

Visitors and other Non-Essential Personnel should be prohibited from remaining in or entering an area contaminated by hydrogen sulfide exceeding an atmospheric concentration of 10 ppm or a concentration of sulfur dioxide exceeding 2 ppm in the atmosphere.

7. EMERGENCY RESPONSE ACTION

7.1 Contingency Plan Activation

The plan will be activated when a release creates an H_2S concentration greater than the activation levels set forth in the Plan itself. At a minimum, the Plan shall be activated at Level I 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 3,000 feet from the site of release. Since this plan applies to a pipeline gathering system, only level I is addressed herein.

7.1.1 Activation Levels

Level I- Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or: mandatory activation of indication of 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release. Because the 100 ppm radius of impact (ROE) boundary is greater than 3000 feet from the site of release, a Level III response would occur before the escape of the 24-hour release volume.

7.1.2 Events That Could Lead to a Release of H_2S

- Failure of gas pipeline
- Flange/gasket leaks on pipeline risers
- Failure of flare to ignite during emergency de-pressurization

7.2 Release Reporting (19.15.11.16 NMAC)

7.2.1 New Mexico

Ameredev shall notify the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD), Oil Conservation Division (Division) upon a release of hydrogen sulfide requiring activation of the Contingency Plan as soon as possible, but no more than four (4) hours after Plan activation, recognizing that a prompt response should supersede notification.

Ameredev shall submit a full report of the incident to the OCD on form C-141 no later than 15 days following the release requiring Contingency Plan activation.

7.3 Immediate Action Plan

Upon notification of an actual or potential hydrogen sulfide facility emergency, the Foreman receiving the notification will:

1. Identify the emergency (leak, pipeline rupture or puncture, fire, equipment malfunction or failure causing release, etc.)
2. For third party notification of emergency, obtain and document the following information in the Leak Report Log:
    a. Caller's Name

   b. Caller's Telephone Number
   c. Caller's Location - Be sure they are located at a safe location away from the emergency
   d. Location of Emergency
   e. Type of Emergency, Presence of Gas, Extent, Medical Help Needed, etc. (In all instances, if the investigation indicates the emergency to be on or involving another company's facilities, efforts will be made to promptly contact the other company and appropriate Public Safety Officials.)
3. Access the emergency scene and ensure your safety and the safety of others nearby. (Consider the scene: isolated, public, or populated area, etc., and identify type of terrain, weather, and wind conditions).
4. From a safe location, call the Field Superintendent as soon as possible and relay the situation information:
   a. Type of emergency, severity, and precise location
   b. If applicable, type of gas being transported (include estimated hydrogen sulfide content if known)
   c. Means of further communication with company personnel
5. Isolate the fuel source(s), if the incident is a fire. Isolation should always be done from a safe location - **DO NOT PLACE YOURSELF IN DANGER.**
6. Secure the area; take care of people's safety first.
7. The Foreman will ascertain the radius of exposure, utilizing the System's maps and make all further notifications from the System's emergency call list (Section 9, System Information and Maps and Appendix B, Emergency Notification Call Lists), including public emergency services needed.
8. The Foreman will dispatch the necessary personnel, equipment, tools, instruments, and materials to the location.
9. Until the arrival of a Supervisor, the Foreman at the site of the emergency will be responsible for assuring the deployment and coordination of employees and public emergency personnel to:
   a. Ascertain the safety of all persons in the area. (Assisting public emergency responders in the Shelter-in-Place or evacuation and/or halting or rerouting traffic at traffic control points (TCPs) on affected roads).
   b. Minimize the volume of H_2S at the site by emergency shutdown, pressure reduction through valve isolation, use of blowdowns, or other means as applicable.
   c. Activate Emergency Shutdown (ESD) system as backup (if applicable).

7.4 Emergency Documentation

All parties involved in an incident should attempt to document the event, but not to the extent that it would interfere with the proper execution of their duties.

Event Checklist "A" and Event Checklist "B" have been provided in Appendix A, and can be used to help document the incident.

7.5 Debriefing

Following practice drills or an incident, all parties involved will convene as soon as possible, preferably within 48 hours to discuss and analyze the event to evaluate and revise any areas of the Plan which may need attention.

7.6 Additional Emergency Response Considerations

Additionally, Emergency Response Action shall consider the following to ensure safety to personnel and the public and to minimize the extent of the emergency:

- Check for damaged or endangered power lines,
- Use of appropriate instruments to assess extent of the radius of exposure and determine the hazardous area,
- Exclusion of all sources of possible ignition,
- Allowing only authorized personnel in area,
- Utilization of proper personal protective equipment which includes respiratory protection and air monitoring instruments,
- Use of fire control equipment to contain fires or cool equipment. Note: Use of water may spread liquid hydrocarbon fires,
- Use of dikes, berms, or containment to control flow or route spills to a controlled/safe location.

8. EMERGENCY RESPONSE PLAN AND PROCEDURES

8.1 General Emergency Procedure Instructions

- All personnel shall wear SCBA's.
- The "buddy system" shall be implemented. All personnel shall act upon the directions of the Leak Site Coordinator.
- If there are Non-Essential Personnel on location, they should move off location.
- All personnel on location will be accounted for.
    - An emergency search should begin for any missing and/or unaccounted for individuals. All search missions shall be conducted under fresh air masks in teams of two (2).
    - Should the search team need to approach the facility, safety harnesses and ropes shall be used.
- All individual companies and agencies should be contacted according to Section 7.2, Release Reporting. Applicable phone numbers are provided in Appendix B of this Plan.
- An assigned employee shall blockade access to the site. No unauthorized personnel shall be allowed entry into the site.

8.2 Shelter-in-Place Procedure

8.2.1 Overview

There are essentially two (2) ways to protect the public from an H_2S release into the atmosphere. One (1) of these methods is evacuation to shelters in a safe area. The other method, Shelter-in-Place (SIP), involves instructing people to remain inside their homes or place of business until the danger passes.

Studies have shown that Shelter-in-Place of "average" homes and buildings under average conditions may experience indoor concentrations on the order of 20-40 percent of outdoor levels after 30 minutes. Therefore, decisions to evacuate or Shelter-in-Place should be determined after evaluating all available information or facts obtained from field personnel.

Because this plan utilizes SIP as the initial response to protect the general public, the following summary of this concept is submitted.

8.2.2 Critical Elements

The review of literature and industry experience has determined that for Shelter-in-Place to be effective the following elements are critical:

- Detection of the problem
- Notification of the public
- Time available to initiate SIP
- Adequate shelters
- Exchange rates of shelters
- Duration of exposure
- Training of the general public
- Acceptance by the general public

8.2.3 Shelter-in-Place Script

Prior to initiating a Shelter-in-Place or evacuation, management must identify the information that will be relayed to the public in order to achieve an organized response. Shelter-In-Place should be initiated by Public Safety Officials; however, some situations may require Ameredev personnel to notify the public of a Shelter-in-Place event. The following script may be used to communicate Shelter-in-Place instructions to the public.

1. Hello, my name is (*name of caller*) and I work for Ameredev Operating, LLC.
2. There has been an accidental release of H_2S gas from our facility at (*specific location*). The H_2S gas being released is toxic and represents a potential health hazard.
3. We are requesting that you immediately take shelter inside your home. In order to protect you from exposure to potentially toxic gas, please stay inside your home and follow these instructions:
    a. Close all doors to the outside and lock all windows (windows sometimes seal better when locked).
    b. Turn off all heating and air conditioning systems.
    c. Place wet towels around windows, doors, and any other areas where outside air may leak inside.
    d. Turn off all exhaust fans in kitchens, bathrooms, and other spaces.
    e. Close all fireplace dampers.
    f. Close as many internal doors as possible.
    g. Use tape and plastic food wrapping, wax paper, or aluminum wrap to cover and seal bathroom exhaust fan grilles, range vents, dryer vents, and other openings to the outside to the extent possible.
    h. Close drapes, curtains, and shades over windows. Stay away from external windows.
    i. Hold a wet cloth or handkerchief over your nose and mouth if you begin to experience nose and/or throat irritation. If possible, go into the bathroom, close the door, and turn on the shower spray to "wash" the air.
4. Are you clear on the instructions? Do you have any special needs that require assistance?
5. Following these instructions will keep you safe and protect you from potential danger. A representative from Ameredev or a local Public Safety Official will follow up with you as soon as the emergency is over.

8.3 Evacuation Procedure

8.3.1 Overview

Evacuation has certain limitations. For example, a major evacuation takes time and may not be feasible once large amounts of toxic gases or vapors have entered the atmosphere. Also, asking people in the path of a toxic H_2S cloud to leave their homes may cause greater harm than good in some cases. Thus, large-scale evacuations in response to an H_2S release are best considered when:

- There is a strong potential for a toxic discharge, the discharge has not yet taken place, and there appears to be time available to relocate people.
- The discharge has taken place, but people are sufficiently far downwind to permit time for evacuation.
- People not yet in the direct path of a cloud or plume are threatened by a future shift in the wind direction.
- The safety hazards of evacuation are outweighed by benefits of the action, and/or
- Telling people to Shelter-in-Place might not fully protect them from serious consequences.

8.3.2 Evacuation Procedure

1. The Leak Control Coordinator shall notify the appropriate agencies and law officers that an emergency exists, and help is needed. The Leak Site Coordinator shall brief them on the situation and coordinate evacuation efforts.
2. The County/Local Fire Department shall contact residents in the danger zone, based on the maps included in this Plan. They shall start with those in a downwind direction.
3. The County/Local Police shall be dispatched to traffic control points to prevent anyone from entering the area.
4. Ameredev personnel shall establish a safe perimeter using H_2S monitors.
5. Supplemental help shall be contacted as needed.

8.3.3 Evacuation Script

Prior to initiating an evacuation, Management must identify the information that will be relayed to the public in order to achieve an organized response. While an evacuation should be initiated by Public Safety Officials, some situations may require Ameredev personnel to notify the public of an evacuation. The following scripts may be used to gather and relay necessary information to the affected public.

1. Hello, my name is (*name of caller*) and I work for Ameredev Operating, LLC.
2. There has been an accidental release of H_2S gas from our facility at (*specific location*). The H_2S gas being released is toxic and represents a potential health hazard.
3. Please leave the area and travel (*north/south/east/west*) on (*road name/number*) to *(evacuation meeting location*). Please avoid (*identify any specific area/road to avoid*).
4. A representative from (*Company/Sheriff's Dept./Fire Dept./Police Dept.*) will be there to assist you and keep you updated on the situation.
5. Are you clear on the instructions? Do you have any special needs that require assistance to evacuate? Thank you and we are sorry for the inconvenience.

8.4 Ignition Procedure

The following procedure has been developed as a general guideline that may be followed to ignite an H_2S leak. Special situations may require deviations from these procedures in order to maintain the maximum degree of safety for the public and operating personnel.

The approval to ignite an H_2S release or to deviate from these procedures must be obtained from the **Field Superintendent.**

8.4.1 Decision Criteria

Criteria for the decision to ignite escaping gas include, but are not limited to, the following:

- Large volume of gas and liquid escaping.
- Obvious total system failure.
- Potential immediate effect to unprotected general public.
- Ignition of escaping gas is not a threat to the general public.

8.4.2 Ignition Team

The following equipment and manpower are required to support an "ignition team":

- One (1) man designated as the "igniter" wearing a minimum of a 30-minute SCBA.
- Two (2) men in a clear area equipped with 30-minute SCBA's capable of rescuing the igniter.
- Two (2) 25mm type flare guns with flares.
- Two (2) spare SCBA air bottles.
- LEL gas detection meter.

8.4.3 Ignition Procedure

1. Determine the perimeter of the flammable area using a flammable gas detector with personnel wearing a self-contained breathing apparatus (SCBA). *The flammable perimeter should be established at 10% of the lower explosive limit.*
2. After the flammable perimeter is established, all employees and citizens must be removed from the area.
3. The ignition team should move to the up-wind side of the leak perimeter and fire a flare into the area. *If the leak is not ignited on first attempt, move in 20 or 30 feet and fire again.*
4. Continue moving in and firing until the leak is ignited, or the flammable gas detector indicates the ignition team is moving into a hazardous area (50% of lower explosive limits). *If trouble is incurred igniting by firing toward the leak, try firing 45° to 90° to each side of the area previously attempted.*

If ignition is not possible due to the make-up of the gas, the toxic leak perimeter must be maintained to ensure no one enters the area and continues until the hazard is controlled.

8.5 First Aid Treatment Procedure

8.5.1 Inhalation

As H_2S in the bloodstream oxidizes rapidly, symptoms of acute poisoning diminish when inhalation of the gas ceases. It is important, therefore, to get the poisoned victim to fresh air as quickly as possible. The victim should be kept at rest and chilling should be prevented. If respiration is slow, labored, or impaired, artificial respiration may be necessary. Most people overcome by H_2S may be revived if artificial respiration is begun before heart action ceases. Victims of poisoning should be under the care of a physician as soon as possible. Irritation due to sub-acute poisoning may lead to serious complications such as pneumonia.

8.5.2 Contact with Eyes

Eye contact with liquid and/or gas containing H_2S will cause painful irritation. Flush/irrigate eyes for five (5) minutes with water or saline. Keep victim in a darkened room, apply ice compresses to eyes, put ice on forehead and send for a physician. Eye irritation caused by exposure to H_2S requires treatment by a physician, preferably an eye specialist.

8.5.3 Contact with Skin

Skin absorption is very low. Skin discoloration is possible after contact with liquids containing H_2S. If such skin contact is suspected, the area should be thoroughly washed.

SHOULD ANY PERSON FALL VICTIM TO H_2S POISONING, AND EMERGENCY MEDICAL SERVICES ARE CALLED OUT, AN ATTEMPT SHOULD BE MADE TO GET THE VICTIM OUT OF THE RADIUS OF EXPOSURE SO THAT EMERGENCY MEDICAL PERSONNEL NEED NOT ENTER THE RADIUS OF EXPOSURE.

8.6 Re-entering to the Affected Site

When the emergency alarm shuts off, all personnel will be instructed to head upwind for at least 15 minutes. The responsible official will perform two (2) points tests using multiple portable H_2S monitors at multiple locations. If the H_2S concentration is below the harmful level, all personnel can re-enter the affected zone.

9. SYSTEM INFORMATION AND MAPS

9.1 Independence Gas Gathering System

The Independence Gas Gathering System consists of approximately 26.85 miles of low-pressure natural gas gathering pipelines in Lea County, NM. As the System's calculated ROE is broken down by segment in Section 9.1.1. Public roads within each segment calculated 500 ppm ROE of the System have been identified, as have public impact points (PIPs) within the calculated 100 ppm ROE of each segment.

9.1.1 Gathering System Radius of Exposure

Table 9-1. Independence Gas Gathering System Radius of Exposure

Segment	County	H_2S Concentration (ppm)	H_2S Concentration (% mol)	Gas Escape Rate, Q, (Mcf/day)	500 ppm (ft)[1]	100 ppm (ft)[2]	Miles
Pinestraw to 3750	Lea County, NM	15,000	1.50	14,000	1,307	2,861	2.04
Desoto to 3750		15,000	1.50	14,000	1,307	2,861	6.46
3750 to ETC		7,400	0.74	14,000	840	1,839	4.67
Central System to Desoto		20,000	2.00	93,500	5,136	11,240	3.69
South System To Desoto (Includes Texas)		20,000	2.00	52,000	3,558	7,786	7.82
Lucid Extension (3 lines)		20,000	2.00	2,800	572	1,251	2.17
						Total:	**26.85**

9.2 Leak Prevention and Safety Systems

9.2.1 Site Detection & Monitoring Systems and On-site Safety Equipment

- The System shall be monitored 24 hours a day by control room. Monitoring will be conducted by observing the SCADA data to ensure there is no loss of pressure in the system.
- Each employee shall be equipped with personal H_2S detectors.

9.2.2 System Safety Equipment

- Block valves to isolate portions of the pipeline
- Pressure relief/flares at production facilities along the pipeline system
- H_2S monitoring system equipped with audible-visual beacons & wind socks located at production facilities
- Remote real-time SCADA data monitoring (pressure & flow rates)

[1] 500 ppm ROE (ft) = [0.4546 * mol% H_2S * Q (cf/day)] $^{0.6258}$

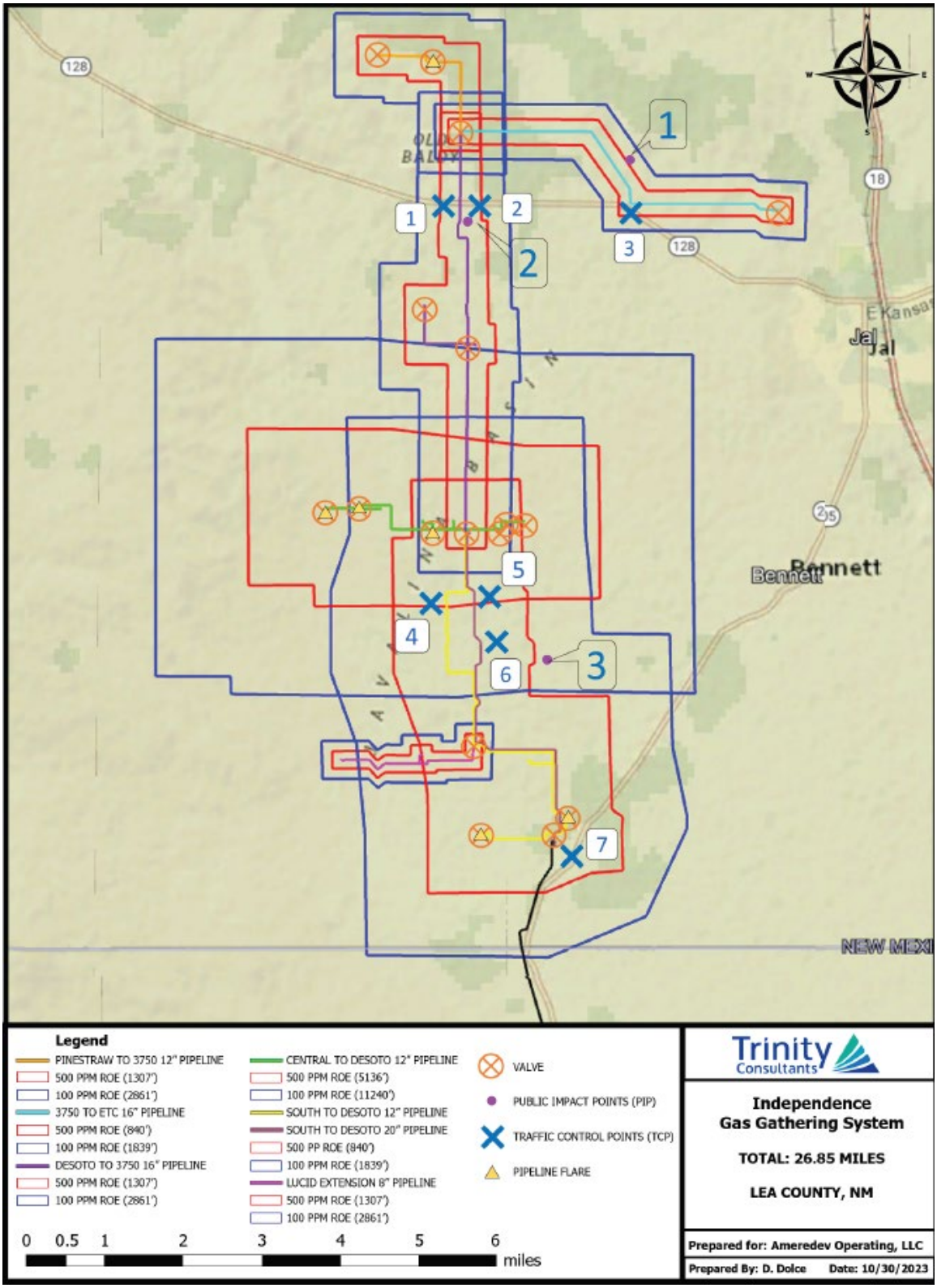
[2] 100 ppm ROE (ft) = [1.589 * mol % H_2S * Q (cf/day)] $^{0.6258}$

9.2.3 Operations Employee Vehicle Safety Equipment

- First Aid Kit
- Personal H_2S Detector
- One (1) 4-Gas Monitor (LEL $H_2S/CO/O_2$)
- One (1) 20-lb. Fire Extinguisher
- Self-Contained Breathing Apparatus (SCBA)

9.3 System Maps

Figure 1: Independence Gas Gathering System Map



9.4 Pinestraw to 3750 12" Pipeline

9.4.1 Gathering System Radius of Exposure

Table 9-2: Pinestraw to 3750 (12" pipeline) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE (ft)	100 ppm ROE (ft)
14,000	15,000	1,307	2,861

9.4.2 Traffic Control Points (TCP)

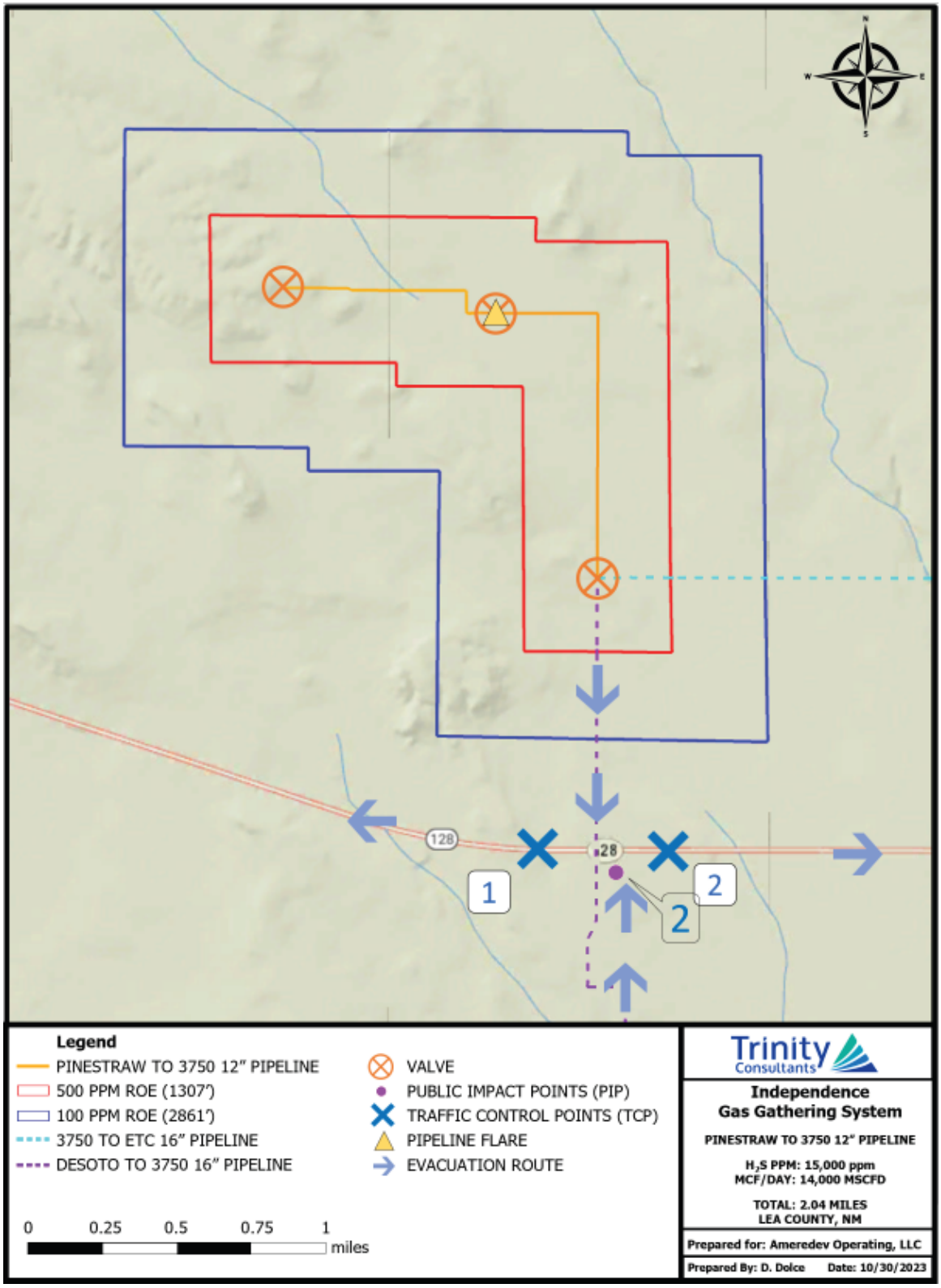
Table 9-3: Pinestraw to 3750 (12" pipeline) traffic control points (TCP)

TCP ID*	GPS Coordinates (NAD 83)	Description
1	32.137783°, -103.2853°	ON W NM HWY 128. 6 Ml W OF ST HWY 18 & HWY 128
2	32.137783°, -103.2779°	ON W NM HWY 128. 5.52 Ml W OF ST HWY 18 & HWY 128

** TCP are placed 1,000 ft back from 100 ppm ROE for an additional buffer*

9.4.3 Pinestraw to 3750 (12" pipeline) System Map

Figure 2: Pinestraw to 3750 (12" pipeline) System Map



9.5 3750 to ETC 16" Pipeline

9.5.1 Gathering System Radius of Exposure

Table 9-4: 3750 to ETC (16" pipeline) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE (ft)	100 ppm ROE (ft)
14,000	7,400	840	1,839

9.5.2 Public Impact Points within 100 ppm ROE

Table 9-5: 3750 to ETC (16" pipeline) public impact points within 500 ppm ROE

PIP ID	Address/GPS (NAD 83)	Phone Number	Notes
1	Ameredev Operating Portable Field Office 32.146313°, -103.245624°	Ameredev Control Room (512) 364-8569	Packet Left 12/14/2020

9.5.3 Traffic Control Points (TCP)

Table 9-6: 3750 to ETC (16" pipeline) traffic control points (TCP)

TCP ID*	GPS Coordinates (NAD 83)	Description
1	32.137783°, -103.2853°	ON W NM HWY 128. 6 MI W OF ST HWY 18 & HWY 128
2	32.137783°, -103.2779°	ON W NM HWY 128. 5.52 MI W OF ST HWY 18 & HWY 128
3	32.135972°, -103.2444°	ON W NM HWY 128. 3.54 MI W OF ST HWY 18 & HWY 128

** TCP are placed 1,000 ft back from 100 ppm ROE for an additional buffer*

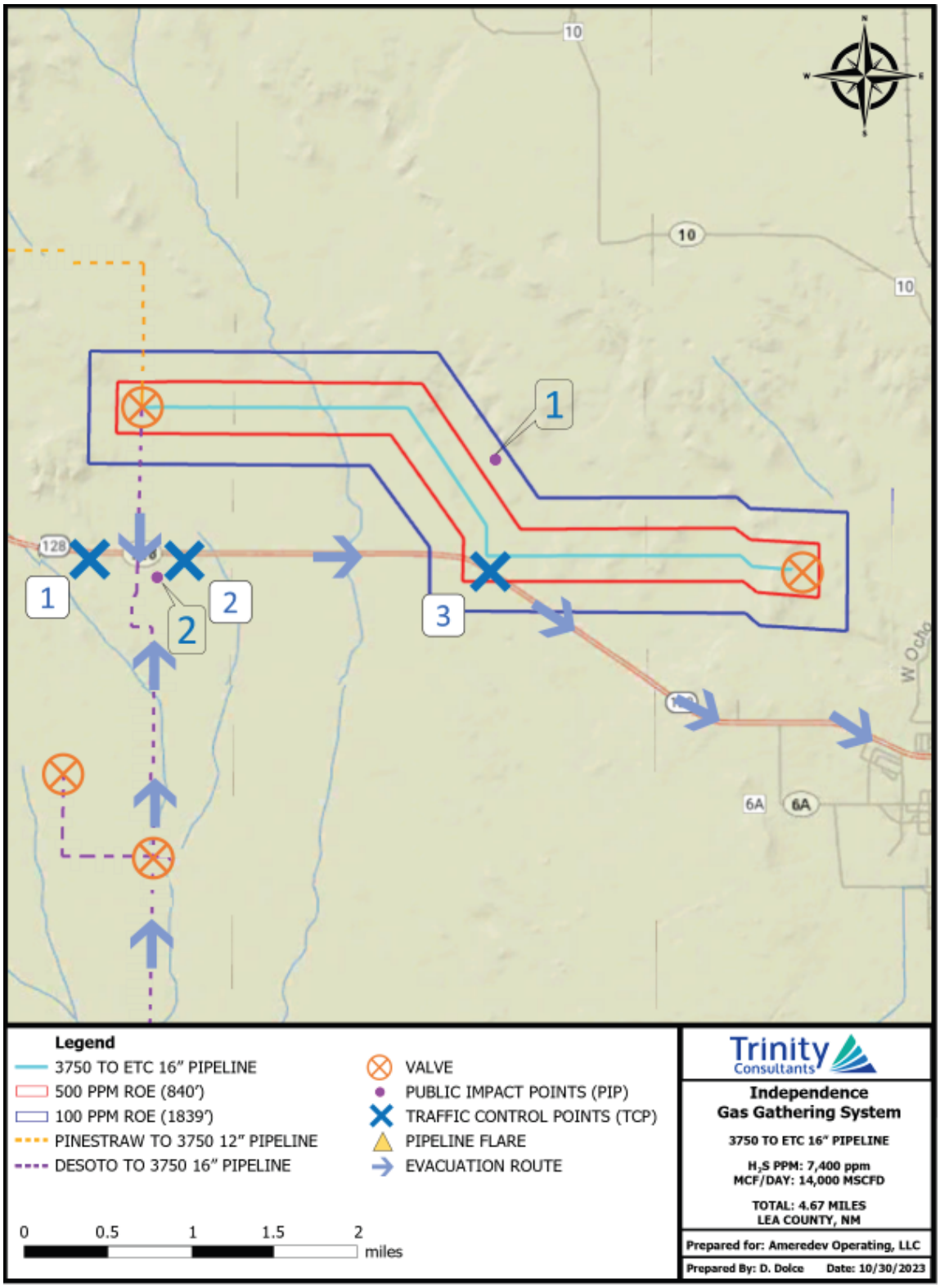
9.5.4 Public Roads within 500 ppm ROE

Table 9-7: 3750 to ETC (16" pipeline) public roads within 500 ppm ROE

Road
W NM HWY 128

9.5.5 3750 to ETC (16" pipeline) System Map

Figure 3: 3750 to ETC (16" pipeline) system map



9.6 Desoto to 3750 16" Pipeline

9.6.1 Gathering System Radius of Exposure

Table 9-8: Desoto to 3750 (16" pipeline) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE	100 ppm ROE
14,000	15,000	1,307	2,861

9.6.2 Public Impact Points within 100 ppm ROE

Table 9-9: Desoto to 3750 (16" pipeline) public impact points within 500 ppm ROE

PIP ID	Address/GPS (NAD 83)	Phone Number	Notes
2	Global Water Solutions Portable Field Office 32.136268°, -103.280603°	Donnie Hill (575) 390-1207	No Contact made. Packet Left 12/14/2020

9.6.3 Traffic Control Points (TCP)

Table 9-10: Desoto to 3750 (16" pipeline) traffic control points (TCP)

TCP ID*	GPS Coordinates (NAD 83)	Description
1	32.137783°, -103.2853°	ON W NM HWY 128. 6 MI W OF ST HWY 18 & HWY 128
2	32.137783°, -103.2779°	ON W NM HWY 128. 5.52 MI W OF ST HWY 18 & HWY 128
3	32.135972°, -103.2444°	ON W NM HWY 128. 3.54 MI W OF ST HWY 18 & HWY 128
4	32.065004°, -103.2889°	ON ANTHONY RD. 4.45 MI W OF FRYING PAN RD & ANTHONY RD
5	32.064945°, -103.2754°	ON ANTHONY RD. 3.68 MI W OF FRYING PAN RD & ANTHONY RD

** TCP are placed 1,000 ft back from 100 ppm ROE for an additional buffer*

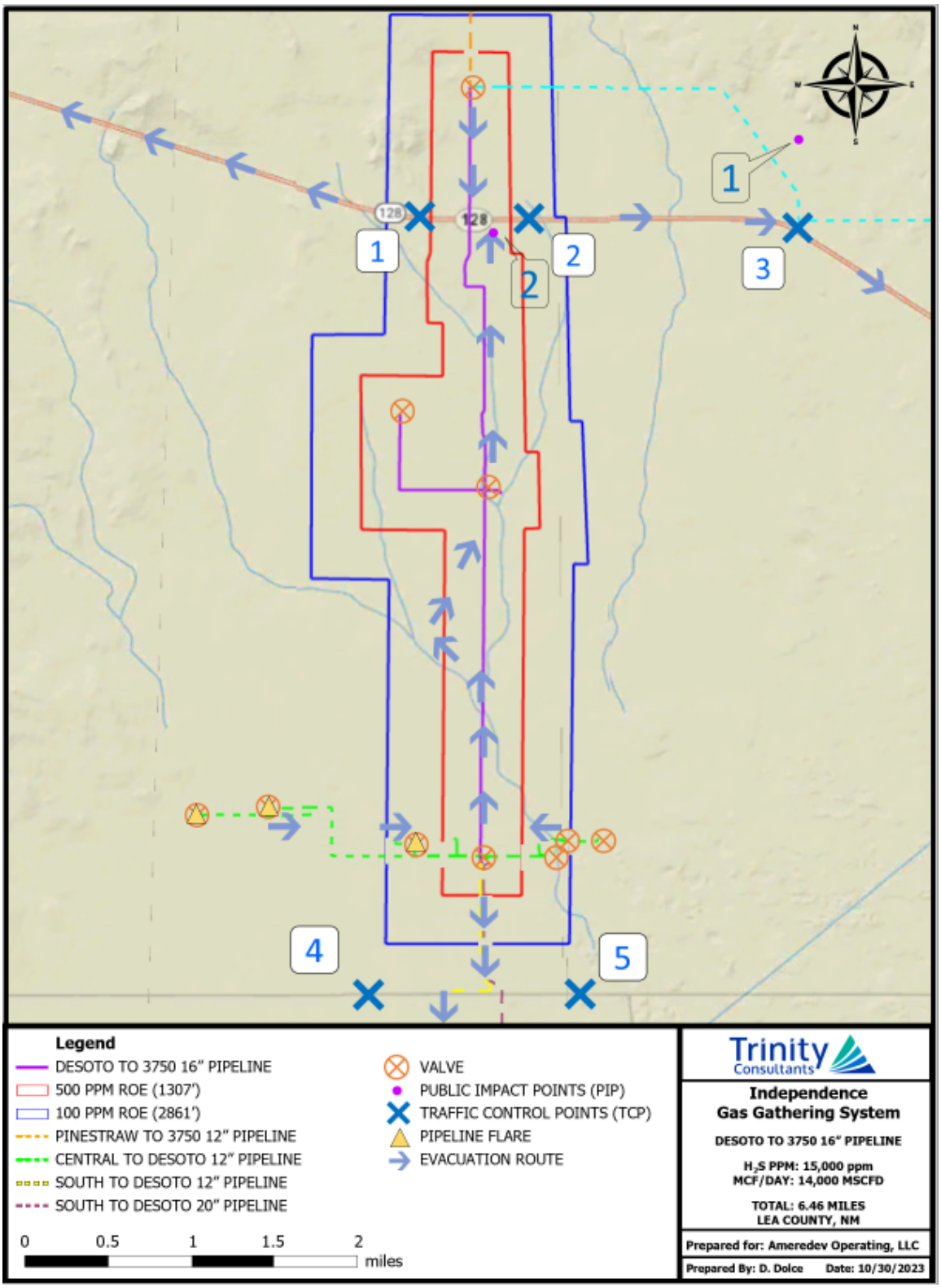
9.6.4 Public Roads within 500 ppm ROE

Table 9-11: Desoto to 3750 (16" pipeline) public roads within 500 ppm ROE

Road
W NM HWY 128

9.6.5 Desoto to 3750 (16” pipeline) System Map

Figure 4: Desoto to 3750 (16” pipeline) system map



9.7 Central System to Desoto 12" Pipeline

9.7.1 Gathering System Radius of Exposure

Table 9-12: Central System to Desoto (12" pipeline) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE (ft)	100 ppm ROE (ft)
93,500	20,000	5,136	11,240

9.7.2 Public Impact Points within 100 ppm ROE

Table 9-13: Central System to Desoto (12" pipeline) public impact points within 100 ppm ROE

PIP ID	Address/GPS (NAD 83)	Phone Number	Notes
3	Intrepid Potash-New Mexico LLC 32.0524876°, -103.26168°	Head Office: (303) 296-3006	No contact made.

9.7.3 Traffic Control Points (TCP)

Table 9-14: Central System to Desoto (12" pipeline) traffic control points (TCP)

TCP ID*	GPS Coordinates (NAD 83)	Description
4	32.065004°, -103.2889°	ON ANTHONY RD. 4.45 MI W OF FRYING PAN RD & ANTHONY RD
5	32.064945°, -103.2754°	ON ANTHONY RD. 3.68 MI W OF FRYING PAN RD & ANTHONY RD
6	32.059651°, -103.2800°	ON ANTHONY RD. 3 MI W OF FRYING PAN RD & ANTHONY RD

* *TCP are placed 1,000 ft back from 100 ppm ROE for an additional buffer*

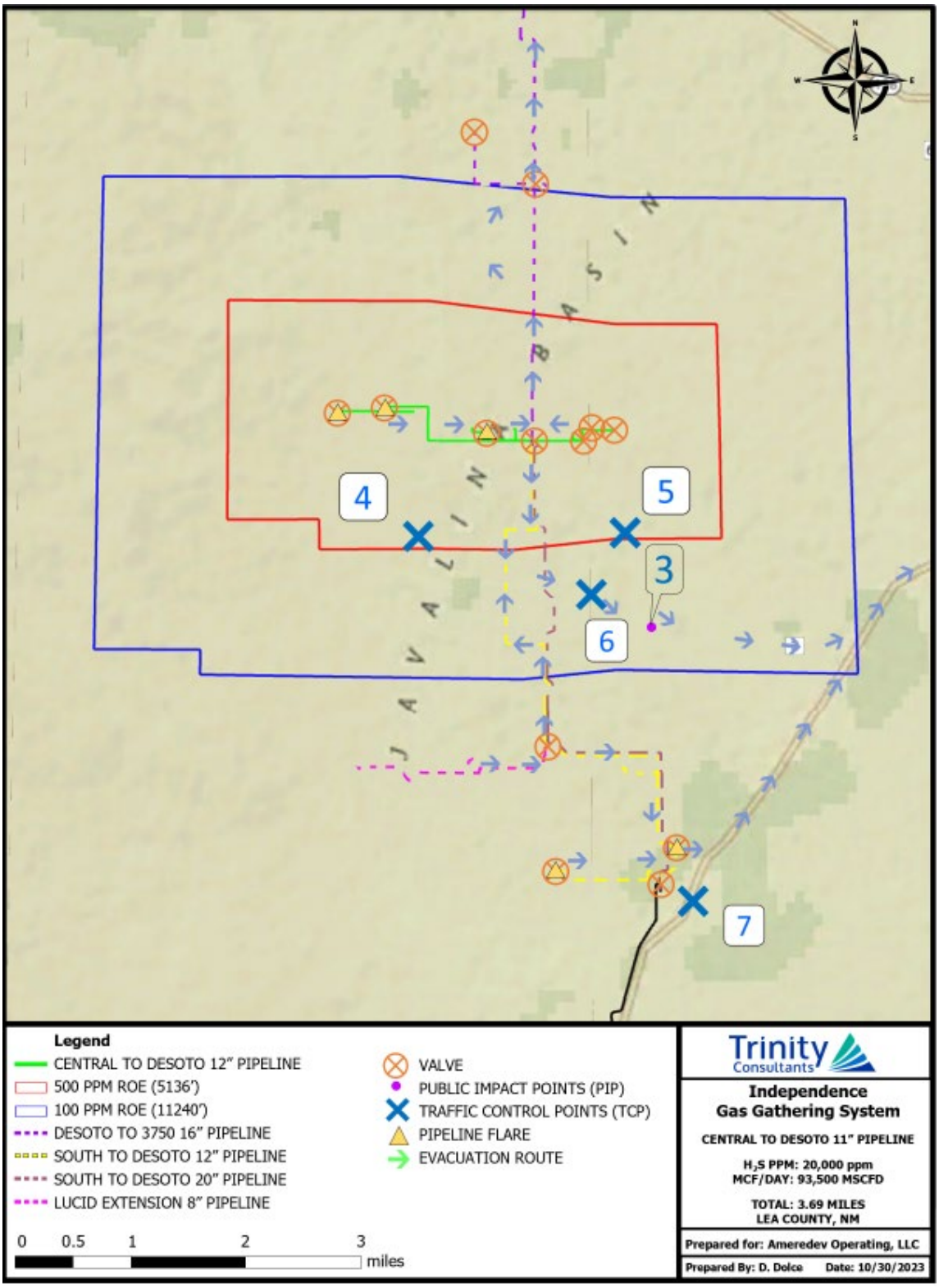
9.7.4 Public Roads within 500 ppm ROE

Table 9-15: Central System to Desoto (12" pipeline) public roads within 500 ppm ROE

Road
FRYING PAN RD (J-3)

9.7.5 System Map

Figure 5: Central System to Desoto (12" pipeline) system map



9.8 South System to Desoto 12" Pipeline (Includes Texas)

9.8.1 Gathering System Radius of Exposure

Table 9-16: South system to Desoto (12" pipeline) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE (ft)	100 ppm ROE (ft)
52,000	20,000	3,558	7,786

9.8.2 Public Impact Points within 100 ppm ROE

Table 9-17: South system to Desoto (12" pipeline) public impact points within 100 ppm ROE

PIP ID	Address/GPS (NAD 83)	Phone Number	Notes
3	Intrepid Potash-New Mexico LLC 32.0524876°, -103.26168°	Head Office: (303) 296-3006	No contact made.

9.8.3 Traffic Control Points (TCP)

Table 9-18: South system to Desoto (12" pipeline) traffic control points (TCP)

TCP ID*	GPS Coordinates (NAD 83)	Description
4	32.065004°, -103.2889°	ON ANTHONY RD. 4.45 MI W OF FRYING PAN RD & ANTHONY RD
5	32.064945°, -103.2754°	ON ANTHONY RD. 3.68 MI W OF FRYING PAN RD & ANTHONY RD
6	32.059651°, -103.2800°	ON ANTHONY RD. 3 MI W OF FRYING PAN RD & ANTHONY RD
7	32.015571°, -103.2631°	ON BECKHAM RD. 0.29 MI W OF FRYING PAN RD & BECKHAM RD

** TCP are placed 1,000 ft back from 100 ppm ROE for an additional buffer*

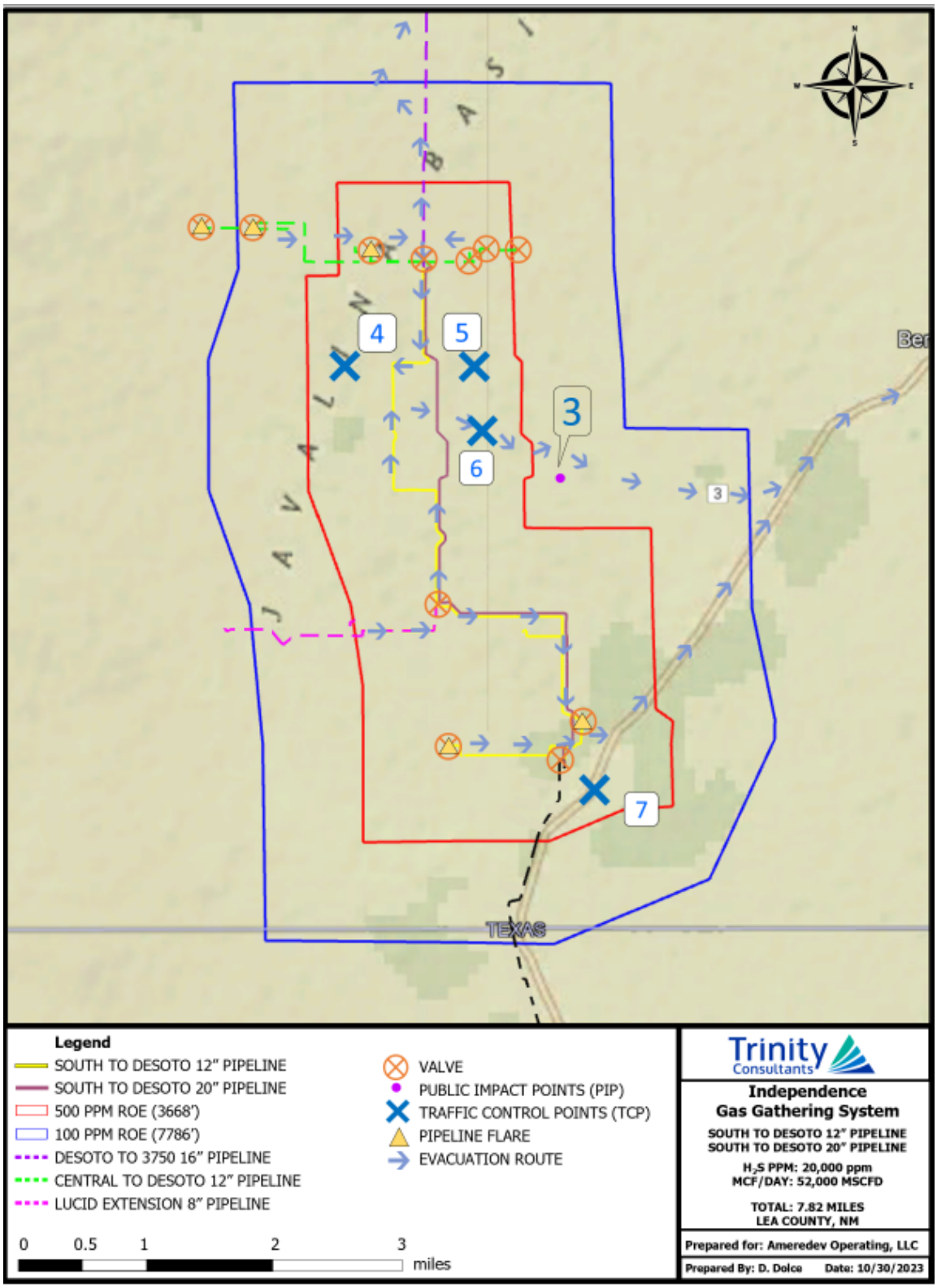
9.8.4 Public Roads within 500 ppm ROE

Table 9-19: South system to Desoto (12" pipeline) public roads within 500 ppm ROE

Road
FRYING PAN RD (J-3)
ANTHONY RD

9.8.5 System Map

Figure 6: South system to Desoto (12" pipeline) system map



9.9 Lucid Extension 8" Pipeline (3 Lines)

9.9.1 Gathering System Radius of Exposure

Table 9-20: Lucid extension (8" pipeline, 3 lines) system radius of exposure

Gas Rate (MCFD)	H_2S Concentration (ppm)	500 ppm ROE (ft)	100 ppm ROE (ft)
2,800	20,000	572	1,251

APPENDIX A. FORMS

Appendix A. Forms

1. Contingency Plan Revision Log

REV	EFFECTIVE DATE	DESCRIPTION OF MODIFICATION	APPROVED BY
0	12/15/2020	Original Plan	
1	8/11/2023	Updates to various gas rates and incorporation of additional pipelines.	
2	10/30/2023	Various updated to address OCD comments and incorporate changes to gas flow rates and additional pipelines.	

Hydrogen Sulfide Contingency Plan Independence Gas Gathering System	
APPENDIX A Issue Date: 12/15/2020	**FORMS**

2. Leak Event/Notification Log

Date:	Time:	Call Received from:
Caller's Telephone Number for Next 2 hours: *Note: Tell them to keep people away from the area. Company will react to the situation immediately.*		
Nearest Intersection:	County:	State:
Type of Incident: ☐Gas Release ☐Sour Gas Release ☐Explosion ☐Fire ☐Liquid Spill ☐Odor ☐Vehicle Accident ☐Personal Injury ☐Other:		
Type of Facility: ☐Gas Pipeline ☐Liquid Pipeline ☐Well ☐Gas Plant ☐Compressor station ☐ Production Site ☐Other:		
Are there any injuries or fatalities: ☐Yes ☐No. If yes, explain:		
Weather Conditions: ☐Clear ☐Cloudy ☐Rain ☐Fog ☐Snow ☐Cold ☐Windy ☐Other:		
What actions have already been taken: ☐Operated Remote Valves ☐Notified Personnel or Agencies ☐Other:		
Are nearby public affected? ☐Yes ☐No. If yes, explain:		
Cause (if known, Do not speculate, but give facts such as third party damage, equipment failure, etc.):		
Other Relevant Information:		

3. Event Checklist "A"

System: _____

Notification Source: _____

Date: _____ Time: _____

Time contact made with Leak Control Coordinator: _____

Name of Leak Control Coordinator: _____

Time contact made with Public Safety entity: _____

Leak Control Coordinator reaches location (Time): _____

Leak Control Coordinator assessment of system condition and problem:

Onsite weather conditions: _____

Public Safety agencies contacted: _____

Agency contacted #1: _____ Time: _____

Agency contacted #2: _____ Time: _____

Agency contacted #3: _____ Time: _____

Regulatory agencies contacted: _____

Regulatory Agency contacted #1: _____ Time: _____

Regulatory Agency contacted #2: _____ Time: _____

Regulatory Agency contacted #3: _____ Time: _____

Area Manager contacted (Name & Time): _____ Time: _____

Additional Company personnel Contacted: _____

Company Person contacted #1: _____ Time: _____

Company Person contacted #2: _____ Time: _____

Company Person contacted #3: _____ Time: _____

Company Person contacted #4: _____ Time: _____

Leak Site Coordinator (Name): _____

Leak Site Coordinator on site (Time): _____

Leak Site Coordinator assessment of system condition and problem:

Leak Site Coordinator assessment of severity of problem:

Leak Site Coordinator assessment of time required to secure: _____

Decision made to activate telephone notification system (Time): _____

Leak Affected Area(s) chosen: _____

Telephone Notification system activated (Time): _____

Summary of message delivered to residents via telephone notification:

Site penetration begins (Time): _____

Leak Site Coordinator establishes safe area perimeter (Time): _____

Staging Area location chosen (Time): _____

Location of Staging Area: _____

4. Event Checklist "B"

Hydrogen Sulfide Contingency Plan Independence Gas Gathering System	
APPENDIX A Issue Date: 12/15/2020	**FORMS**

Company personnel begin arriving at Staging Area (Time): _____

Public Safety personnel begin arriving at Staging Area (Time): _____

Contact begins with non-responsive general public (Time): _____

Traffic Control Teams in place (Time): _____

Traffic Control Points Chosen (List by number):

Decision to evacuate: ___ YES _____ NO

Assessment and decision on evacuation (Time): _____

Decision made by: _____

Leak Affected Area(s) designated for evacuation:

Telephone Notification Service instructed to send out evacuation message (Time): _____

Begin making direct contact with non-responsive general public (Time): _____

Assessment and decision on ignition of escaping gas (Time): _____

Decision to ignite escaping gas: _____ YES _____ NO

Decision made by: _____

Ignition complete (Time): _____

Corrective measures to be taken:

Correction Vendor Resources selected to take corrective action:

Correction Resources notified (Time): _____

Evacuation completed (Time): _____

Problem secure (Time): _____

Stand down procedure begun (Time): _____

All response personnel accounted for (Time): _____

Exercise Terminated – All clear given (Time): _____

Evacuated Public notified of all clear (Time): _____

Remarks:

APPENDIX B. EMERGENCY NOTIFICATION CALL LISTS

Appendix B. Emergency Notification Call Lists

1. 24-hour Emergency & Leak Report Phone Number

(737) 300-4799

2. Company Plant/Office Contact List

AMEREDEV OPERATING, LLC			
OFFICE	LOCATION	MAIN PHONE	24-HR PHONE
Corporate Office	2901 Via Fortuna Ste 600 Austin, TX 78746	(737) 300-4700	(737) 300-4799

3. Company & Responder Contact List

AMEREDEV OPERATING, LLC			
NAME	TITLE	OFFICE PHONE	CELL PHONE
Floyd Hammond	Chief Operating Officer	(737) 300-4724	(512) 783-6810
Jeremy Short	Field Supervisor		(806) 789-0261
Ameredev Control Room			(512) 364-8569
Dayeed Khan	Midstream and EHS Manager		(281) 928-4692

Hydrogen Sulfide Contingency Plan Independence Gas Gathering System	
APPENDIX B Issue Date: 12/15/2020	**EMERGENCY NOTIFICATION CALL LISTS**

4. Public Safety Group Contact List

LEA COUNTY, NM		
FIRE DEPARTMENT(S)		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Knowles Fire Department Maljamar Fire Department Monument Fire Department	1923 N. Dal Paso, Suite A Hobbs, NM 88240	911 or (575) 391-2983 (575) 391-2988
Jal Fire Department	400 S. 4th St. Jal, NM 88252	911 or (575) 395-2501
SHERIFF'S DEPARTMENT		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Lea County Sheriff's Department	1417 S. Commercial Street Lovington, NM 88260	911 or (575) 396-3611
LOCAL POLICE DEPARTMENT(S)		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Hobbs Police Department	300 N. Turner Street Hobbs, NM 88240	911 or (575) 397-9265
Jal Police Department	3421 NM-18 Jal, NM 88252	911 or (575) 395-2501
NEW MEXICO STATE POLICE		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
New Mexico State Police Hobbs, NM	5100 Jack Gomez Blvd. Hobbs, NM 88240	911 or (575) 392-5880
EMERGENCY MANAGEMENT		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Lea County Emergency Management Director Lorenzo Velasquez	1019 E. Bender Blvd. Hobbs, NM 88240	911 or (575) 391-2983 (575) 942-8222 - Cell
GAME WARDEN		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
NMDGF Conservation Lea County Andrew Jolliff	1912 W. Second St. Roswell, NM 88201	(575) 624-6135 - Area Office (505) 629-7114 – Cell
LEPC/SERC		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
SERC Administrator: Henry Jolly	P.O. Box 27111 Santa Fe, NM 87502	(505) 476-9635- Emergency (505) 476-0617 – Cell henry.jolly@state.nm.us

Hydrogen Sulfide Contingency Plan Independence Gas Gathering System	
APPENDIX B Issue Date: 12/15/2020	**EMERGENCY NOTIFICATION CALL LISTS**

5. Emergency Medical Support Contact List

LEA COUNTY, NM		
AMBULANCE SERVICE(S)		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Hobbs Ambulance Service	301 E White Street Hobbs, NM 88240	911 or (575) 397-9308
EMS - Lovington	213 S. Love Lovington, NM 88260	911 or (575) 396-2359
EMS- Jal	400 S 4th St. Jal, NM 88252	911 or (575) 395-2501
HOSPITAL(S)		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Lea County Regional Medical Center	5419 N. Lovington Hwy. Hobbs, NM 88240	(575) 492-5000
Nor-Lea General Hospital	1600 N. Main Ave. Lovington, NM 88260	(575) 396-6611
DOCTOR(S)		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
Lea County Regional Medical Center	5419 N. Lovington Hwy. Hobbs, NM 88240	(575) 492-5000
Nor-Lea General Hospital	1600 N. Main Ave. Lovington, NM 88260	(575) 396-6611
Lea County Medical Group Primary & Urgent Care	5320 N. Lovington Hwy Hobbs, NM 88240	(575) 392-1973

6. Regulatory Agency Contact List

LEA COUNTY, NM		
REGULATORY AGENCIES		
DESCRIPTION	**LOCATION**	**PHONE NUMBER**
New Mexico Environment Department (NMED) District III Lea County Discharge Reporting	726 E. Michigan, Suite 160 Hobbs,NM 88240	(575) 391-0464 (575) 393-4302 FAX
New Mexico Environment Department (NMED) Emergency		(505) 827-9329 (24 Hour)
New Mexico Environment Department (NMED) Non-Emergency		(866) 428-6535 (24 Hour Voice Mail)
New Mexico Energy,Minerals and Natural Resource Department (NMEMNRD-OCD)	1625 N. French Drive Hobbs,NM 88240	(575) 370-3186 Emergency (575) 241-7063 (575) 393-0720 FAX Santa Fe Office: (505) 476-3441
New Mexico Public Regulation Commission - Pipeline Safety Bureau (NMPRC-PSB)	1120 Paseo De Peralta,Rm. 416 P.O. Box 1269 Santa Fe,NM 87504	(505) 490-2375 - Emergency (505) 476-0298

Hydrogen Sulfide Contingency Plan Independence Gas Gathering System	
APPENDIX B Issue Date: 12/15/2020	**EMERGENCY NOTIFICATION CALL LISTS**

FEDERAL & STATE

REGULATORY AGENCIES

DESCRIPTION	LOCATION	PHONE NUMBER
Environmental Protection Agency (EPA) – Region 6 Main Office	1445 Ross Ave., Suite 1200 Dallas, TX 75202	(800) 887-6063 (214) 665-2760
National Response Center (NRC)	2100 2nd St. SW Stop 7238 Washington, DC 20593	(800) 424-8802
US Coast Guard District 8 Office	Hale Boggs Federal Building 500 Poydras Street, Suite 1240 New Orleans, LA 70130	(504) 589-6225
Occupational Safety and Health Administration (OSHA) Region 6	525 Griffin St. Ste 602 Dallas, TX 75202	(972) 850-4145
National Weather Service Albuquerque, NM	2341 Clark Carr Loop SE Albuquerque, NM 87106-5633	(505) 243-0702
State Emergency Response Commission (SERC) – New Mexico	PO Box 27111 Santa Fe, NM 87502	(505) 476-9635
New Mexico Oil Conservation Division District 1 – Lea County	1625 N. French Drive Hobbs, NM 88240	(575) 393-6161
New Mexico Pipeline Safety Bureau	1120 Paseo De Peralta, Rm. 416 PO Box 1269 Santa Fe, NM 87504	(505) 476-0298 Emergency (505) 490-2375
New Mexico Department of Transportation – District 2 Roswell	4505 W. Second, Roswell, NM P.O. Box 1457 Roswell, NM 88202-1457	(575) 840-3035
New Mexico Department of Health – Lea County	1923 N. Dal Paso, Suite B Hobbs, NM 88240	(575) 397-2463
New Mexico Department of Health – Lovington County	302 N. 5th Street Lovington, NM 88260	(575) 396-2853
New Mexico Department of Public Safety (NMDPS)	4491 Cerrillos Rd. Santa Fe, NM 87507	(505) 827-9207
New Mexico Department of Public Safety (NMDPS) – District 3 Hobbs	5100 Jack Gomez Blvd. Hobbs, NM 88240	(575) 392-5580

APPENDIX C. HYDROGEN SULFIDE INFORMATION

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™
The National Institute for Occupational Safety and Health (NIOSH)
Promoting productive workplaces through safety and health research NIOSH

Hydrogen sulfide

SYNONYMS & TRADE NAMES

Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen

CAS NO.

7783-06-4

RTECS NO.

MX1225000

DOT ID & GUIDE

1053 117

FORMULA

H_2S

CONVERSION

1 ppm = 1.40 mg/m^3

IDLH

100 ppm
See: 7783064

EXPOSURE LIMITS

NIOSH REL
C 10 ppm (15 mg/m^3) [10-minute]
OSHA PEL
C 20 ppm 50 ppm [10-minute maximum peak] See Appendix G

MEASUREMENT METHODS

NIOSH 6013;
OSHA ID141
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless gas with a strong odor of rotten eggs. [Note: Sense of smell becomes rapidly fatigued & can NOT be relied upon to warn of the continuous presence of H_2S. Shipped as a liquefied compressed gas.]

MOLECULAR WEIGHT	BOILING POINT	FREEZING POINT	SOLUBILITY	VAPOR PRESSURE	IONIZATION POTENTIAL
34.1	-77°F	-122°F	0.4%	17.6 atm	10.46 eV

	FLASH POINT	UPPER EXPLOSIVE LIMIT	LOWER EXPLOSIVE LIMIT	RELATIVE GAS DENSITY	
	NA (Gas)	44.0%	4.0%	1.19	

Flammable Gas

INCOMPATIBILITIES & REACTIVITIES

Strong oxidizers, strong nitric acid, metals

EXPOSURE ROUTES

inhalation, skin and/or eye contact

SYMPTOMS

irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite

TARGET ORGANS

Eyes, respiratory system, central nervous system

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: When wet (flammable)
Change: No recommendation
Provide: Frostbite wash

FIRST AID

(See procedures)
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

RESPIRATOR RECOMMENDATIONS

NIOSH

Up to 100 ppm:
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0165

Page last reviewed: October 30, 2019
Content source: National Institute for Occupational Safety and Health

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration

Hydrogen Sulfide

Hydrogen Sulfide Menu

Workers' Rights

Hazards

Health Hazards

Hydrogen sulfide gas causes a wide range of health effects. Workers are primarily exposed to hydrogen sulfide by breathing it. The effects depend on how much hydrogen sulfide you breathe and for how long. Exposure to very high concentrations can quickly lead to death.

Short-term (also called acute) symptoms and effects are shown below:

Worker Exposure Limits
NIOSH REL (10-min. ceiling): 10 ppm
OSHA PELs: General Industry Ceiling Limit: 20 ppm General Industry Peak Limit: 50 ppm (up to 10 minutes if no other exposure during shift) Construction 8-hour Limit: 10 ppm Shipyard 8-hour limit: 10 ppm
NIOSH IDLH: 100 ppm
IDLH: immediately dangerous to life and health (level thatinterferes with the ability to escape) (NIOSH) **PEL:** permissible exposure limit (enforceable) (OSHA) **ppm:** parts per million **REL:** recommended exposure limit (NIOSH)

Concentration (ppm)	**Symptoms/Effects**
0.00011-0.00033	Typical background concentrations
0.01-1.5	Odor threshold (when rotten egg smell is first noticeable to some). Odor becomes more offensive at 3-5 ppm. Above 30 ppm, odor described as sweet or sickeningly sweet.
2-5	Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep. Airway problems (bronchial constriction) in some asthma patients.
20	Possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness.
50-100	Slight conjunctivitis ("gas eye") and respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite.
100	Coughing, eye irritation, loss of smell after 2-15 minutes (olfactory fatigue). Altered breathing, drowsiness after 15-30 minutes. Throat irritation after 1 hour. Gradual increase in severity of symptoms over several hours. Death may occur after 48 hours.
100-150	Loss of smell (olfactory fatigue or paralysis).
200-300	Marked conjunctivitis and respiratory tract irritation after 1 hour. Pulmonary edema may occur from prolonged exposure.
500-700	Staggering, collapse in 5 minutes. Serious damage to the eyes in 30 minutes. Death after 30-60 minutes.

Concentration (ppm)	Symptoms/Effects
700-1000	Rapid unconsciousness, "knockdown" or immediate collapse within 1 to 2 breaths, breathing stops, death within minutes.
1000-2000	Nearly instant death

What about longer term health effects? Some people who breathed in levels of hydrogen sulfide high enough to become unconscious continue to have headaches and poor attention span, memory, and motor function after waking up. Problems with the cardiovascular system have also been reported at exposures above permissible exposure limits. People who have asthma may be more sensitive to hydrogen sulfide exposure. That is, they may have difficulty breathing at levels lower than people without asthma.

Safety Hazards

- Hydrogen sulfide is a highly flammable, explosive gas, and can cause possible life-threatening situations if not properly handled.
  In addition, hydrogen sulfide gas burns and produces other toxic vapors and gases, such as sulfur dioxide.

  The explosive range of hydrogen sulfide in air is 4.3 to 45 percent. This range is much higher than the PEL.
- In addition to exposure to hydrogen sulfide in the air, exposure to liquid hydrogen sulfide can cause "blue skin" or frostbite. If clothing becomes wet, avoid ignition sources, remove the clothing and isolate it in a safe area to allow it to evaporate.
- The effect called knockdown (rapid unconsciousness) often results in falls that can seriously injure the worker.

The following resources provide more information on the safety and health effects of hydrogen sulfide:

- Hydrogen Sulfide (H_2S). OSHA Fact Sheet, (October 2005). Provides a concise list of industrial sources, symptoms and health effects of exposure to hydrogen sulfide, and OSHA requirements for the protection of workers.
- Hydrogen Sulfide (H_2S). OSHA QuickCard™. Provides the important safety precautions for hydrogen sulfide.
- Hydrogen Sulfide. National Institute for Occupational Safety and Health (NIOSH) Workplace Safety and Health Topic. Provides a listing of NIOSH and related resources on hydrogen sulfide.
- NIOSH Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health (NIOSH) Publication No. 2005-149. Provides physical descriptions, exposure limits, measurement methods, personal protection and sanitation, first aid, respirator recommendations, exposure routes, symptoms, target organs, and other information about hydrogen sulfide.
- IDLH Documentation for Hydrogen Sulfide. National Institute for Occupational Safety and Health (NIOSH), (Revised August 16, 1996). Describes how NIOSH determined hydrogen sulfide Immediately Dangerous to Life and Health (IDLH).
- ToxFAQs for Hydrogen Sulfide. Agency for Toxic Substances and Disease Registry (ATSDR), (July 2006). Answers the most frequently asked health questions about hydrogen sulfide.
- Toxicological Profile for Hydrogen Sulfide. Agency for Toxic Substances and Disease Registry (ATSDR), (July 2006). More detailed technical information on hydrogen sulfide, health effects, chemical and physical properties, potential for human exposure, and analytical methods.
- Medical Management Guidelines for Hydrogen Sulfide. Agency for Toxic Substances and Disease Registry (ATSDR), (April 2006). Provides general information about hydrogen sulfide, its health effects, and specific medical treatments for hydrogen sulfide exposure.

Scroll to Top

OSHA Standards Enforcement Topics Media Center Contact Us

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration
200 Constitution Ave NW
Washington, DC 20210
1-800-321-OSHA
1-800-321-6742
www.osha.gov

FEDERAL GOVERNMENT

- White House
- Benefits.gov
- Coronavirus Resources
- Disaster Recovery Assistance
- DisasterAssistance.gov
- USA.gov
- Notification of EEO Violations
- No Fear Act Data
- U.S. Office of Special Counsel

OCCUPATIONAL SAFETY & HEALTH

- Frequently Asked Questions
- A - Z Index
- Freedom of Information Act - OSHA
- Read The OSHA Newsletter
- Subscribe to the OSHA Newsletter
- OSHA Publications
- Office of Inspector General

ABOUT THE SITE

- Freedom of Information Act
- Disclaimers
- Plug-ins Used on DOL.gov
- Accessibility Statement

Connect With OSHA

APPENDIX D. SULFUR DIOXIDE INFROMATION

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

Sulfur dioxide

SYNONYMS & TRADE NAMES

Sulfur oxide, Sulfurous acid anhydride, Sulfurous oxide

CAS NO.

7446-09-5

RTECS NO.

WS4550000

DOT ID & GUIDE

1079 125

FORMULA

SO_2

CONVERSION

1 ppm = 2.62 mg/m^3

IDLH

100 ppm
See: 7446095

EXPOSURE LIMITS

NIOSH REL
TWA 2 ppm (5 mg/m^3) ST 5 ppm (13 mg/m^3)
OSHA PEL
TWA 5 ppm (13 mg/m^3) See Appendix G

MEASUREMENT METHODS

NIOSH 3800 , 6004;
OSHA ID104 , ID200
See: NMAM or OSHA Methods

PHYSICAL DESCRIPTION

Colorless gas with a characteristic, irritating, pungent odor. [Note: A liquid below 14°F. Shipped as a liquefied compressed gas.]

MOLECULAR WEIGHT	BOILING POINT	FREEZING POINT	SOLUBILITY	VAPOR PRESSURE	IONIZATION POTENTIAL
64.1	14°F	-104°F	10%	3.2 atm	12.30 eV

	FLASH POINT	UPPER EXPLOSIVE LIMIT	LOWER EXPLOSIVE LIMIT	RELATIVE GAS DENSITY	
	NA	NA	NA	2.26	

Nonflammable Gas

INCOMPATIBILITIES & REACTIVITIES

Powdered alkali metals (such as sodium & potassium), water, ammonia, zinc, aluminum, brass, copper [Note: Reacts with water to form sulfurous acid (H_2SO_3).]

EXPOSURE ROUTES

inhalation, skin and/or eye contact

SYMPTOMS

irritation eyes, nose, throat; rhinorrhea (discharge of thin nasal mucus); choking, cough; reflex bronchoconstriction; liquid: frostbite

TARGET ORGANS

Eyes, skin, respiratory system

PERSONAL PROTECTION/SANITATION

(See protection codes)
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: When wet or contaminated (liquid)
Change: No recommendation
Provide: Frostbite wash

FIRST AID

(See procedures)
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

RESPIRATOR RECOMMENDATIONS

NIOSH

Up to 20 ppm:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern*
(APF = 10) Any supplied-air respirator*

Up to 50 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern*

Up to 100 ppm:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern*
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

SEE ALSO

INTRODUCTION ICSC CARD: 0074

Page last reviewed: October 30, 2019
Content source: National Institute for Occupational Safety and Health

APPENDIX E. NOTICE OF AN ADMINISTRATIVELY INCOMPLETE HYDROGEN SULFIDE CONTINGENCY PLAN

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Dylan Fuge, Division Director
Oil Conservation Division

BY ELECTRONIC MAIL ONLY

August 31, 2023

Floyd Hammond
Chief Operating Officer
Ameredev Operating, LLC
2901 Via Fortuna, Ste 600
Austin, TX 78746
737.300.4700
fhammond@ameredev.com

RE: Ameredev Operating, LLC - Notice of an Administratively Incomplete Hydrogen Sulfide Contingency Plan, Independence Gas Gathering System

Dear Mr. Hammond:

The New Mexico Energy, Minerals and Natural Resource Department's Oil Conservation Division (OCD) has reviewed the Hydrogen Sulfide (H_2S) Contingency Plan submitted to the OCD on December 17, 2020, by Ameredev Operating, LLC (Ameredev) for the Independence Gas Gathering System in Lea County, NM.

OCD has determined that the submitted H_2S Contingency Plan is incomplete. The H_2S Contingency Plan does not include all content components as required by 19.15.11 NMAC. Therefore, the OCD is requesting the below additional information, modifications, and/or clarification for administrative completeness of the submitted H_2S Contingency Plan:

1. Section 1.2 states, "The Plan will be activated prior to an intentional release..." Ameredev needs to explain what circumstances would require an intentional release.

2. Section 1.3.2 states, "Inspections of the System, and related equipment, are scheduled and performed regularly." Ameredev needs to elaborate on these inspections and specify their associated frequency. Also, Ameredev needs to include a discussion on the inspection and frequency of the corrosion coupons, analysis of liquids collected from the line, and the cathodic protection system. What does periodic mean in this instance? Lastly, this section states, "For a detailed list of all of the safety systems on each pipeline segment, refer to Section 9.1.3, Independence Gas Gathering System." The OCD was unable to locate this section therefore, Ameredev needs to add this information to the plan.

3. Section 1.3.6 states that door-to-door contact may be made if applicable. Ameredev needs to explain the applicability criteria.

4. Section 3.1.4, states, "In addition to the training programs outlined above, periodic emergency drills shall be held." Ameredev needs to explain the emergency drill program and the frequency of these drills.

5. Section 3.2 discusses liaison with public officials. This section states that briefing occurs in areas where H_2S may exist. Ameredev needs to elaborate on when the briefing occurs and the frequency.

6. Section 3.3 states that the public within the 100-ppm radius of exposure is periodically briefed. Ameredev needs to elaborate on when the briefing occurs and the frequency.

7. Section 3.4 states that training records will be retained for a minimum of one year. Although 19.15.11.9.G NMAC does not specify a time frame for the retention of training records, the OCD is requiring that training records be kept for a minimum of five (5) years for OCD inspection. This section needs to be modified to account for this requirement.

8. Section 5 states, "Emergency response procedures outlined in this Plan are always superseded by the site-specific response plan and the Company Emergency Response Plan." This statement is contradictory to what is stated in Section 1.1 which states, "The response plan is the same regardless of where a release takes place." The H_2S Contingency Plan must be comprehensive and apply to the location(s) specified in the plan. The goal of the H_2S Contingency Plan is to alert and protect the public and contain information on emergency procedures the person will follow in the event of a release. If this plan is not representative and comprehensive for all included locations, Ameredev must create and submit separate plans for their field locations.

9. In Section 7.1.1, explain what is meant by an intermittent alarm to activate a Level I and Level II response. What time frame would trigger the response level? Also, Ameredev needs to include a description of the events that could lead to a release of H_2S sufficient to create a concentration in excess of the activation level.

10. Ameredev needs to include in the plan the inspection/calibration frequency of all safety equipment used, including the SCBA.

11. In the Regulatory Agency Contact List for the OCD, Ameredev needs to change the second phone number to (575) 241-7063 and add the Santa Fe's office contact number of (505) 476-3441.

12. Ameredev needs to add a discussion on the procedure utilized to monitor the ambient air in the area(s) of exposure to determine when it is safe to re-enter.

13. Appendix C (Documentation) does not contain any information. Ameredev needs to add documentation/information to this Appendix.

14. Given the H_2S Contingency Plan applies to multiple sites, Ameredev needs to upload this plan to each applicable well pad, compressor station, gas plant, etc.

A "complete" amended H_2S Contingency Plan is due to the OCD by October 30, 2023 (60 days from email receipt). Please submit the revised H_2S Contingency Plan through the existing E-permitting application page for *all applicable sites* and email an updated plan to me. If you have any questions regarding this letter, please do not hesitate to contact me at (505) 709-5149 or via email.

Respectfully,

Joel Stone

Joel Stone
Environmental Scientist & Specialist
joel.stone@emnrd.nm.gov

CC: Bailey Black, Flatrock Engineering & Environmental, LLC
Leigh Barr, OCD

APPENDIX F. RESPONSES TO NOTICE OF AN ADMINISTRATIVELY INCOMPLETE HYDROGEN SULFIDE CONTINGENCY PLAN

1. Section 1.2 states, "The Plan will be activated prior to an intentional release..." Ameredev needs to explain what circumstances would require an intentional release.
   Circumstances that would require an intentional release have been addressed in Section 1.2 of the Plan.

2. Section 1.3.2 states, "Inspections of the System, and related equipment, are scheduled and performed regularly." Ameredev needs to elaborate on these inspections and specify their associated frequency. Also, Ameredev needs to include a discussion on the inspection and frequency of the corrosion coupons, analysis of liquids collected from the line, and the cathodic protection system. What does periodic mean in this instance? Lastly, this section states, "For a detailed list of all of the safety systems on each pipeline segment, refer to Section 9.1.3, Independence Gas Gathering System." The OCD was unable to locate this section therefore, Ameredev needs to add this information to the plan.
   Cathodic protection and corrosion coupons do not apply since the pipelines and gathering systems are made out of poly material. Section 1.3.2 has been updated to address the safety systems, which are also addressed in Section 9.2.1 and 9.2.2.

3. Section 1.3.6 states that door-to-door contact may be made if applicable. Ameredev needs to explain the applicability criteria.
   Section 1.3.6 has been updated to address the applicability criteria, including what conditions trigger a door-to-door direct contact to public receptors.

4. Section 3.1.4, states, "In addition to the training programs outlined above, periodic emergency drills shall be held." Ameredev needs to explain the emergency drill program and the frequency of these drills.
   Section 3.1.4 has been updated to address training and drills, training in the responsibilities and duties of essential personnel and periodic on-site classroom drills or exercises that simulate a release, and information regarding how the training, drills, and attendance will be documented in accordance with 19.15.11.9.B(2)(d) NMAC.

5. Section 3.2 discusses liaison with public officials. This section states that briefing occurs in areas where H2S may exist. Ameredev needs to elaborate on when the briefing occurs and the frequency.
   Section 3.2 has been updated to address that the public and public officials will only be addressed in the event of an emergency and will be briefed on an annual basis.

6. Section 3.3 states that the public within the 100-ppm radius of exposure is periodically briefed. Ameredev needs to elaborate on when the briefing occurs and the frequency.
   Section 3.3 has been updated to address how often and when briefings will occur.

7. Section 3.4 states that training records will be retained for a minimum of one year. Although 19.15.11.9.G NMAC does not specify a time frame for the retention of training records, the OCD is requiring that training records be kept for a minimum of five (5) years for OCD inspection. This section needs to be modified to account for this requirement.
   Section 3.4 has been updated to address the minimum retention of training records.

8. Section 5 states, "Emergency response procedures outlined in this Plan are always superseded by the site-specific response plan and the Company Emergency Response Plan." This statement is contradictory to what is stated in Section 1.1 which states, "The response plan is the same regardless of where a

release takes place." The H2S Contingency Plan must be comprehensive and apply to the location(s) specified in the plan. The goal of the H2S Contingency Plan is to alert and protect the public and contain information on emergency procedures the person will follow in the event of a release. If this plan is not representative and comprehensive for all included locations, Ameredev must create and submit separate plans for their field locations.
Section 1 and 5 have been updated to clarify that this Plan only applies to the pipeline gathering system. The plan is representative and comprehensive for all included locations. A separate plan is in development for operating facilities.

9. In Section 7.1.1, explain what is meant by an intermittent alarm to activate a Level I and Level II response. What time frame would trigger the response level? Also, Ameredev needs to include a description of the events that could lead to a release of H2S sufficient to create a concentration in excess of the activation level.
Section 7.1.1 has been updated to remove reference to intermittent alarms. A description of events that could lead to the release of H2S has been included in Section 7.1.2.

10. Ameredev needs to include in the plan the inspection/calibration frequency of all safety equipment used, including the SCBA.
Section 1.3.2 has been updated to address inspection/calibration frequency for all safety equipment used.

11. In the Regulatory Agency Contact List for the OCD, Ameredev needs to change the second phone number to (575) 241-7063 and add the Santa Fe's office contact number of (505) 476-3441.
This update has been made in Appendix B.

12. Ameredev needs to add a discussion on the procedure utilized to monitor the ambient air in the area(s) of exposure to determine when it is safe to re-enter.
Section 8.6 has been added to address procedures for determining when it is safe to re-enter affected areas.

13. Appendix C (Documentation) does not contain any information. Ameredev needs to add documentation/information to this Appendix.
This appendix has been removed.

14. Given the H2S Contingency Plan applies to multiple sites, Ameredev needs to upload this plan to each applicable well pad, compressor station, gas plant, etc.
This Plan applies to the pipeline gathering system. Each applicable well pad, compressor station, gas plant, etc. will have a separate plan. This plan applies to areas outside of specific operating facilities.

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Dylan M. Fuge
Deputy Secretary (Acting)

Dylan M. Fuge, Division Director
Oil Conservation Division

BY ELECTRONIC MAIL ONLY

November 7, 2023

Mr. Dayeed Khan
Midstream & EHS Manager
Ameredev Operating, LLC
2901 Via Fortuna, Ste 600
Austin, TX 78746
dkhan@ameredev.com

RE: Ameredev Operating, LLC - Notice of an Administratively Complete Hydrogen Sulfide Contingency Plan, Independence Gas Gathering System, Lea County, NM

Dear Mr. Khan,

The New Mexico Energy, Minerals and Natural Resource Department's Oil Conservation Division (OCD) has reviewed the updated Hydrogen Sulfide (H_2S) Contingency Plan submitted to the OCD on October 31, 2023, by Ameredev Operating, LLC (Ameredev) for the Independence Gas Gathering System in Lea County, NM. The submitted H_2S Contingency Plan included all content components as required by 19.15.11 NMAC; therefore, the OCD has determined that the submitted H_2S Contingency Plan is complete.

Please be advised that OCD's acceptance of this plan does not relieve Ameredev of responsibility should its operations fail to adequately detect, investigate, and/or undertake corrective actions to prevent or stop a hydrogen sulfide release. In addition, OCD's acceptance does not relieve Ameredev of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Please do not hesitate to contact me at (505) 709-5149 or via email should you have any questions.

Respectfully,

Joel Stone

Joel Stone
Environmental Scientist & Specialist
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Phone:(505) 334-6178 Fax:(505) 334-6170
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 281186

CONDITIONS

Operator: AMEREDEV OPERATING, LLC 2901 Via Fortuna Austin, TX 78746	OGRID: 372224
	Action Number: 281186
	Action Type: [UF-H2S] H2S Contingency Plan (H2S Plan)

CONDITIONS

Created By	Condition	Condition Date
joel.stone	None	11/7/2023