

GW - ____33____

**H2S CONTINGENCY
PLAN**

(Gas Plant & AGI Well)

APPROVED

Oct. 7, 2009

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, April 21, 2011 1:23 PM
To: Perrin, Charlie, EMNRD
Cc: VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD
Subject: Anadarko San Juan Gas Plant H2S Release Reporting above Federal RQ Notification

Charlie:

Good afternoon. I don't think any actions are needed from OCD on this notification of an exceedence of the Federal RQ of 100 lbs.

Notification is primarily to the NRC and the caller indicated that the 10 ppm H2S alarms never activated; thus, the H2S CP was not implemented.

OCD H2S Notification Regulation:

19.15.11.16 NOTIFICATION OF THE DIVISION: The person shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan as soon as possible, but no more than four hours after plan activation, recognizing that a prompt response should supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.
[19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

The caller info. and time is as follows:

Julie
Anadarko
(832) 636-2609.
Date and Time of Notification: 4/21/2011 @ 13:00.

Thanks.

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

"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
<http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>)



October 7, 2009

Mr. Brad Jones
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: H₂S Contingency Plan

Dear Mr. Jones:

Pursuant to NMAC 19.15.11, Western Gas Resources Asset Holding Company LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation respectfully submits the final H₂S Contingency Plan Amendment for the San Juan River Gas Plant in regards to the proposed acid gas injection well and subsequent increase in radii of exposure. A hard copy of the plan as well as a compact disk containing the electronic files is enclosed.

If you have any questions or require additional information, please contact me at (832) 636-2609.

Sincerely,

A handwritten signature in black ink, appearing to read "Julie Betik", written over a horizontal line.

Julie Betik
Sr. Staff Environmental Analyst

RECEIVED OCD
2009 OCT - 8 P 12:38



H₂S CONTINGENCY PLAN

(Amendment Related to Acid Gas Injection Well)

San Juan River Gas Plant
Kirtland, New Mexico

**WESTERN GAS RESOURCES ASSET HOLDING
COMPANY, LLC, a wholly owned subsidiary of Anadarko
Petroleum Corporation**

(October 2009)

Preface

This amendment addresses the H₂S Contingency Plan to be implemented with the installation of an acid gas injection well and associated equipment at the San Juan River Gas Plant. In that this Plan addresses *proposed* conditions, it should be noted that the Plan and associated appendices will be updated and a revised Plan duly distributed to reflect the *actual* installation of the well, associated injection facilities and additional monitoring where and if applicable.

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
A. PLANT DESCRIPTION & MAP (Figure 1)	
B. DESCRIPTION OF OPERATIONS	
II. THE PLAN	3
A. RESPONSIBILITY FOR CONFORMANCE WITH THE H ₂ S PLAN	
B. REVISIONS TO THE PLAN	
C. AVAILABILITY OF THE H ₂ S PLAN	
D. CONTENT OF THE PLAN	
III. PLAN DESIGN CONSIDERATIONS	4
A. CHARACTERISTICS OF HYDROGEN SULFIDE, SULFUR DIOXIDE AND OTHER	
1. Hydrogen Sulfide	
2. Sulfur Dioxide	
3. Carbon Dioxide	
B. RADII OF EXPOSURE (ROE)	
IV. EMERGENCY ACTION PROCEDURES	9
A. EMERGENCY RESPONSE ORGANIZATION	
B. EMERGENCY RESPONSE	
1. Objective	
2. Plant Evacuation and Emergency Assembly Areas	
3. Immediate Action Plan	
4. Emergency Shut Down System	
5. Notifications and Reports	
6. Site Security	
7. Sign & Markers	
8. First-Aid Station	
9. Media Site	
10. Emergency and Safety Equipment	
V. TRAINING AND DRILLS	20

APPENDICES

Appendix A – Worst Case Scenario for H₂S Release

Appendix B – Calculation for Radius of Exposure

Appendix C – Radius of Exposure (ROE) Map Showing H₂S Monitor and Road Block Locations

Appendix D – Plant Diagram - Evacuation Routes, H₂S Monitoring and Alarm Locations

Appendix E – Description of Emergency Response Equipment

Appendix F – H₂S Contingency Plan - Response Flow Diagram(s)

Appendix G – Emergency Call List

Appendix H – H₂S Plan Distribution List

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the “Plant”) is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the “H₂S Plan” or “the Plan”) has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API “Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide,” RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will be implemented to ensure a coordinated, efficient and immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29N, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:

Latitude: 36.453 N Longitude: 108.220 W

2. Its physical address is:

99 County Road 6500, Kirtland, New Mexico 87417

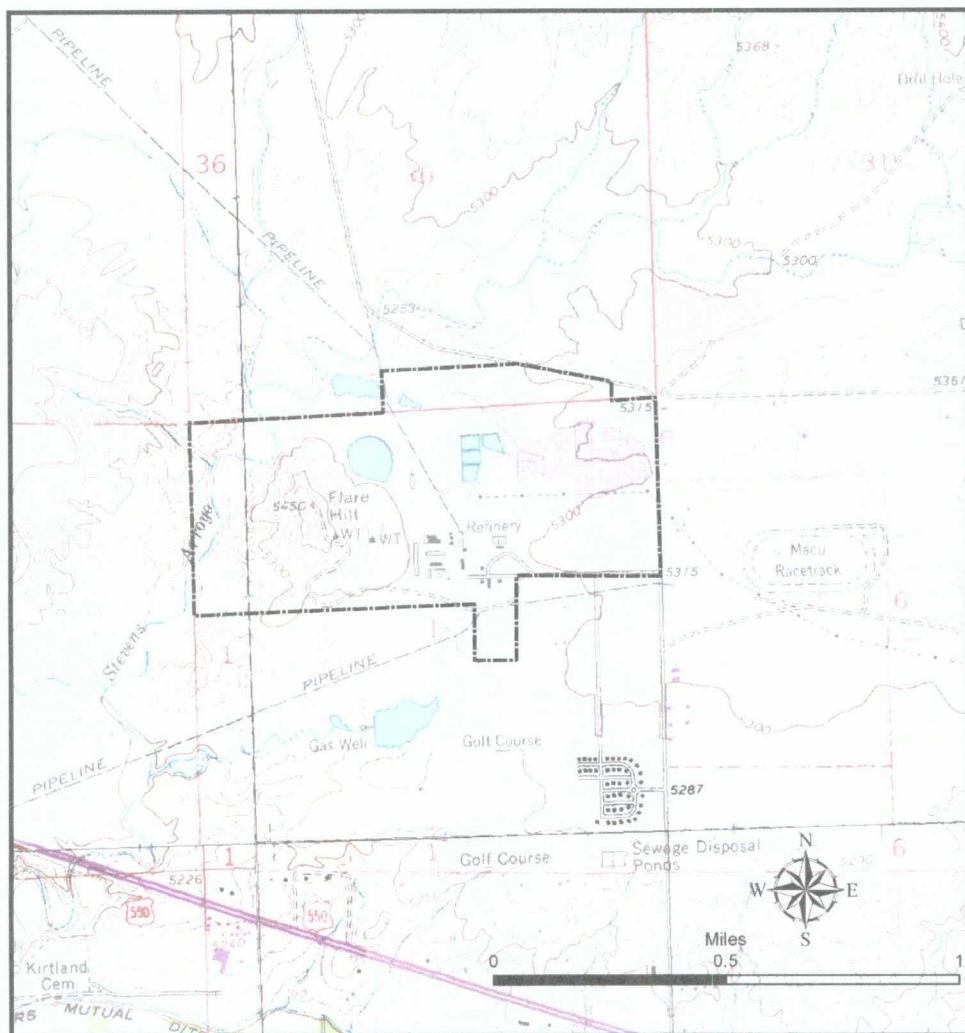
3. Its mailing address is:

P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

From the intersection of US Highway 64 and the La Plata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.



**Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant**

Figure 1 Anadarko San Juan River Plant Location

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.
2. Because the natural gas that is gathered at the Plant contains hydrogen sulfide (“sour gas”), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H₂S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H₂S is routed to an incinerator where it is combusted into sulfur dioxide.
3. The Plant anticipates the need to process a higher volume of natural gas due to the development of additional natural gas resources in the area. This increased processing capacity will necessitate an expansion of the Plant. The Plant predicts an increase in inlet volume to 50 MMCFD with about 6000 ppm H₂S content. The Plant has proposed the installation of an acid gas injection (AGI) well to accommodate disposal of the acid gas stream generated by existing and expanded operations. The expanded operation is expected to generate approximately 3.80 MMCFD of acid gas for disposal. The existing sulfur reduction unit (SRU) currently being used to treat the acid gas will be replaced by the AGI well following approval of the AGI well permit by NMOCD and successful completion of the AGI well.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H₂S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H₂S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H₂S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information

and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H₂S PLAN

The H₂S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H₂S Distribution List**, which lists all the additional entities that have been provided a copy of the H₂S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H₂S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H₂S or SO₂ release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H₂S and SO₂, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H₂S, SO₂ AND CARBON DIOXIDE

1. Hydrogen Sulfide (H₂S)

The proposed inlet gas streams into the Plant will contain approximately 6,000 ppm (or 0.60 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H ₂ S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F

Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		Physical Effect
ppm	%	
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide (SO₂)

Sulfur dioxide is produced as a by-product of H₂S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

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

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

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

3. Carbon Dioxide

The proposed inlet gas streams to the Plant will contain approximately 7% carbon dioxide based on the anticipated additional gas to the Plant which will be confirmed with inlet gas monitoring readings. Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO ₂
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	Effect
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the “Radius of Exposure” for both 500-ppm and 100-ppm of H₂S gas was determined using the “escape rate”, which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations**. Also refer to **Appendix C - map showing 500-ppm ROE and the 100-ppm ROE**.

500-ppm ROE	1634 feet
100-ppm ROE	3576 feet

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H₂S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H₂S Plan contained herein.

The Plant Superintendent or his designee shall determine:

- 1) Plant Shutdowns
- 2) Isolation of pipeline segments
- 3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H₂S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H₂S or SO₂ emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H₂S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in **Appendix F**.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H₂S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H₂S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 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 ROE boundary is greater than 3000 ft from the site of release, a Level 3 response would occur before the escape of the 24 hour release volume.

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

- A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H₂S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel in evacuating to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is

downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D**.

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

**Area at Plant Rd and Hwy 6500
(see Appendix C)**

The Emergency Assembly Area 3 is:

**Kirtland Elementary School Parking Lot , 30 Road 6446
(see Appendix C)**

- B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action Plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H₂S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H₂S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H₂S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H₂S. A control panel in the Plant control room establishes which H₂S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the intermittent alarm or the flashing red beacon,

each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). A fixed H₂S perimeter monitor at Emergency Assembly Area 1 has a H₂S concentration read out to assure safety or further evacuation to Assembly Area 2 (>10 ppm). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. All entities within the 500 ppm ROE (see **Appendices C and G**) and BHP Mines will be notified of a release by personnel designated by the Plant Superintendent or his designee. The nature of the release and status of containment will be conveyed. Parties will be advised to report the incident to employees working near the Plant and to alert any third party contractors or service companies working in the Plant vicinity or imminently scheduled to work in the Plant vicinity of the release. All should be instructed to leave the area and not to enter/re-enter area until further notice.
3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H₂S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor as well as with the fixed monitor.
4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H₂S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H₂S level. In addition, a fixed H₂S perimeter monitor at Assembly Area 2 has a H₂S concentration read out. If evacuation to Emergency Assembly Area 2 occurs, a road block to the Plant entrance will be established. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter the Plant. BHP, Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) will be notified once release is contained and monitored H₂S levels are less than 10 ppm. The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H₂S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H₂S greater than 20 PPM. Flashing red beacons indicate a H₂S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. A control panel in the Plant control room establishes which H₂S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the

continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix C**). necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate, if they have not already. All entities within the 100 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release. The nature of the release and status of containment will be conveyed. Depending on release status and prevailing wind conditions, some entities within the 100 ppm ROE may be asked to shelter in place or evacuate. Notifications will include but are not limited to the following:
 - Praxair, BHP and all unmanned businesses will be instructed to alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They should be instructed to immediately leave and/or not enter/re-enter the Plant vicinity until further instruction.
 - BHP will be advised to check ventilation shaft status within the 500 and 100 ppm ROE and take internal company pre-emptive safety action(s) as deemed appropriate.
 - Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.
 - San Juan College will be notified of the release and depending on prevailing wind conditions may be requested to shelter in place or evacuate.
 - Other entities within the 100 ppm ROE, depending on release status and prevailing wind conditions, will be asked to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
3. The LEPC and law enforcement will be contacted by phone and notified of the release and status of containment. The Plant Superintendent or his designee will assign personnel notification responsibility.

4. Operator(s) with 30 minute SCBA will assess the release and attempt to resolve it. If after 15 minutes there is no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.
5. If monitored H₂S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.
 - a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.
 - b) If release is resolved and monitored levels of H₂S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan. All entities previously notified will be informed that the release has been resolved and advised of the current monitored H₂S levels at the Plant.
 - c) No resolution requires activation of full H₂S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H₂S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H₂S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.
2. Road blocks will be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock will be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant) (see **Appendix C.**)
3. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Evacuation of all entities within the 500 ppm ROE will have been confirmed. Implement full H₂S Plan with all notifications and public agency involvement. Notifications to all entities within the 100 ppm ROE will include the nature of the release and status of containment. Notifications will include but are not limited to the following:
 - All businesses within the 100 ppm ROE will be instructed to immediately alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the

release and evacuation status of the Plant. They will be instructed to immediately leave and/or not enter/reenter the area within the roadblocks until further instruction.

- All other entities (including private residents) within the 100 ppm ROE will be instructed to immediately shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
 - BHP will be advised to check ventilation shaft status within the Plant vicinity and take internal company pre-emptive safety action(s) as deemed appropriate.
 - Riverview Golf Course will be instructed to immediately clear the course of both employees and golfers and to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.
 - San Juan College will be notified of the release and advised to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction. Depending on the event circumstances, the IC commander will make a summary judgment, based on but not limited to H₂S concentration and wind direction, whether a safe evacuation should be implemented and advise on evacuation route.
4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.
 5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.
 6. Initiate and maintain a Chronological Record of Events log.
 7. Within one hour after the activation of the H₂S Plan, begin agency notifications by calling OCD and NRC.
 8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.
 9. Once resolved and monitored levels in the Plant and at Assembly Area 2 are less than 10 ppm, roadblocks will be removed, and all entities within the 100 ppm ROE will be allowed to return. All entities previously notified will be informed

that the release had been resolved and advised of the current monitored H₂S levels.

10. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H₂S monitoring devices to assist them in detecting the presence of unsafe levels of H₂S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H₂S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devices are to be worn as low on the body as possible since H₂S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a valve or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:
 - Name, telephone number, and location of person reporting the situation; and
 - Type and severity of the emergency; and

- Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
 - The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
 - Description of injuries and report of damage to property and structures; and
 - Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.
2. If the Plant personnel detect H₂S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H₂S Plan activated if necessary.
 3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.
 4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H₂S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H₂S Plan. The Company has compiled a list of various public, private, state and local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations of its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. All entities within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant and recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public; and
- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public Roads:

Public Road 6500 is within the 100 ppm radius of exposure, and portions of Public Roads 6520, 6257 and Cemetery Road are slightly within the southernmost extension of the 100 ppm radius of exposure. Similarly, a small portion of Public Roads 6448 and 6480 are slightly within the eastern portion of the 100 ppm radius of exposure (see **Appendix C**). The specific residences included within the 100 ppm radius of exposure are listed on **Appendix G** along with addresses and contact phone numbers.

2. Businesses or Other Public Areas:

All businesses included in **Appendix G** will be provided with a copy of the H₂S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:

The public areas located within the 100 ppm radius of exposure are identified in **Appendix G**.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, there are active BHP Mining ventilation pipe ducts within the 100 ppm radius of exposure and inactive ventilation pipe ducts within the 500 ppm radius of exposure.

Additional businesses within the 100 ppm radius of exposure are listed on **Appendix G** and they will be notified if the Plan is activated as per the various levels of the immediate action Plan described above. These businesses or their

corporate offices (in the case of unmanned facilities) will be notified if the Plan is activated as per the immediate action Plan.

Within the 500 ppm ROE:

One manned business (Praxair) is located within the 500 ppm radius of exposure (see **Appendix G**). Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate. The corporate offices of the four unmanned businesses will also be notified immediately if the Plan is activated according to the level specific procedures described above.

Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

6. SITE SECURITY

- A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.
- B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.
- C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.
- D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.
- E. For any evacuation to Emergency Assembly Area 2, a road block at the Plant entrance will be established to prevent further entrance to the Plant.
- F. For a Level 3 release a road block would be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock would be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant).

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H₂S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- | |
|--|
| <ul style="list-style-type: none">• Plant Superintendent Office Building,• Maintenance/Safety Office Building, and• Each company vehicle |
|--|

9. MEDIA SITE

- A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 3.
- B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E and Appendix D** for information pertaining to the Plant's emergency and Safety equipment. In addition, see **Appendix C** for the location of additional H₂S sensors that will be installed outside the Plant boundary as part of the Plant expansion related to the AGI well permit.

V. TRAINING/DRILLS/EDUCATION

A. TRAINING

1. Training on the H₂S Plan
 - Inclusion of local officials and LEPC
 - Public areas and businesses (within the ROE)
 - Those on the Plan distribution list
2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H₂S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.
- Hydrogen Sulfide and Sulfur Dioxide Training -- All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.
- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H₂S certification. Medical clearance review for work in a H₂S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.
- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.
- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.
2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans
3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:
 - a. Description or scope of the drill, including date and time
 - b. Attendees and Participant to the drill
 - c. Summary of activities and responses
 - d. Post drill de-brief and reviews

C. EDUCATION

1. All businesses and residents within the 100 ppm ROE will be educated as to plant alarms, when they will be contacted and what it means to shelter in place.
2. All businesses and or residents that could be asked to evacuate will be advised as to best evacuation routes.

APPENDIX A

WORST CASE SCENARIO

The basis for worst case scenario calculations is as follows:

- 6000 parts per million (ppm) or 0.60 mole percent of hydrogen sulfide in the inlet natural gas stream into the San Juan River Gas Plant; and
- a maximum daily (24 hour) processing volume of 50,000 MMCF.
- The worst case scenario radius of exposure (ROE) also assumes an uncontrolled instantaneous release from the area around the AGI well of the above referenced volume and concentration. Because the Plant is a throughput process plant there is no actual way that the entire throughput volume of the Plant could be released instantaneously as is assumed in the worst case scenario calculations of the ROE in **Appendix B** and shown in **Appendix C**; however, to comply with NMAC 19.15.11, we have used that assumption in our worst case scenario formulas/calculations provided in Appendix B.

It should further be noted that the reason this rate, used as worst case, could not be released over a 24 hour period is the Plant's Emergency Shutdown (ESD) systems that would be activated. The ESD would prevent the flow of gas into the Plant in the event of an emergency. The ESD system is discussed in greater detail in **Appendix E**.

APPENDIX B

RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CALCULATION

$$X = [(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{0.6258}$$

Where:

X = Radius of exposure in feet

Hydrogen Sulfide Concentration = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture

Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

- a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant, after the installation of the AGI well, the Company is using for contingency planning purposes an "escape rate" equal to the anticipated (maximum) inlet gas volume of 50,000 MCFD. The (actual) inlet gas volume at the Plant will be somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. The assumed 50,000 MCFD inlet gas volume has been selected as the "escape rate" because it is the highest anticipated inlet volume that the Plant would handle under its proposed operations and is considered worst case interpretation of the volume of gas. It should be noted that the plan will remain effective as long as the processed volume and H₂S content equate to the same ROE. As addressed below.

As to hydrogen sulfide concentration of the inlet gas, daily monitoring data of current operations indicates variable concentrations, but concentration will not exceed 6000 ppm or 0.60 mole percent. Therefore, 6000 ppm or 0.60 mole percent has been used in the worst case scenario for the expanded operations with the AGI well for contingency planning purposes.

Using:

Q = 50,000,000

H₂S conc = 6000 ppm or 0.60 mole%

$$\frac{[(0.4546)(\text{H}_2\text{S concentration})(\text{gas volume (Q)})]^{0.6258}}{[(0.4546)(6000 \cdot 0.000001)(50,000,000)]^{0.6258}}$$

500-ppm ROE = 1634 feet

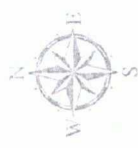
100-ppm RADIUS OF EXPOSURE CALCULATION

$$\frac{[(1.589)(\text{H}_2\text{S concentration})(\text{gas volume})]^{0.6258}}{[(1.589)(6000 \cdot 0.000001)(50,000,000)]^{0.6258}}$$

100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM
RADIUS OF EXPOSURE MAP
SHOWING LOCATION OF ADDITIONAL
OFF-SITE H₂S MONITORS AND
LOCATION OF ROADBLOCKS



San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure

PROPOSED OPERATIONS

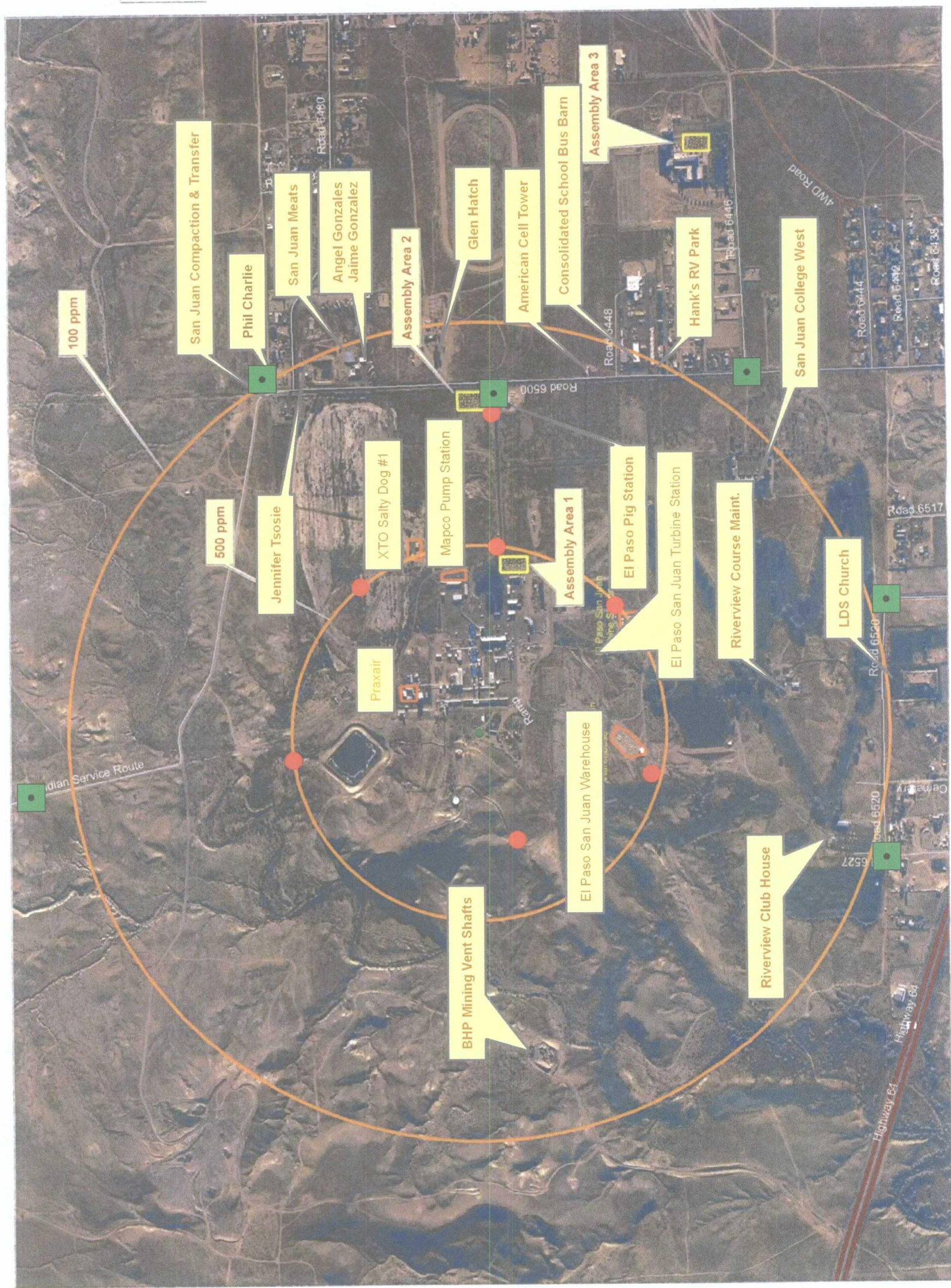
AGI Well *

Radius of Exposure

- 1634 ft (500 ppm)
- 3576 ft (100 ppm)
- Assembly Area
- Business

*Based on 50 MMiscfd @ 6000 ppm H₂S

- H₂S Monitors
- Road Blocks



APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS

APPENDIX E

DESCRIPTION OF H₂S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (**Appendix D**). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H₂S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When any one of the eight (8) manual stations is activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant, on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block valves furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

The proposed acid gas injection facilities will contain emergency shutdown systems in case of surface equipment failure and/or well failure. The ESD system for the proposed facilities and injection well will be further documented in the Plan upon construction.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.
2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H₂S. The frequency of this intermittent alarm will increase as the concentration of the H₂S release increases. The alarm will become continuous when the concentration of the H₂S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.
3. A flashing red beacon signifies an H₂S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.
4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or

evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.
6. Additional permanent off-site H₂S monitors will be placed on the perimeter of the Plant coincident with the calculated radii of exposure as shown on **Appendix C**. These monitors will assist Anadarko in appropriate notification of potentially affected entities in the vicinity of the Plant within the calculated 100 ppm radius of exposure. The perimeter monitors give the operators an indication of H₂S leaving the plant boundaries. The perimeter monitors will activate the plant horn and flashing red beacon as described above. A control panel in the Plant control room/operators building indicates which monitor has triggered the alarm be it a plant monitor or perimeter monitor. All perimeter monitors have an external read out of H₂S concentration. Perimeter monitors can only be monitored from the Plant control room or by a walk up visual reading. In the event the control room is evacuated, the plant ESD system will be activated, substantially reducing the ROE, where perimeter monitors can be safely manually read.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H₂S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operator's PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm. The additional off-site sensors shown on **Appendix C** will be of the same type and calibrated as described in this paragraph for the Plant sensors.
2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating Plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors; these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H₂S of all the Plant sensors on their control/monitor PLC located in the operator's building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly. Proposed perimeter monitors will be calibrated quarterly as well.
3. Hand held gas detection monitors are available to Plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment.

There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H₂S with a beeping sound at 10 ppm. The beeps change in tone as H₂S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H₂S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H₂S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.
2. The respirator containers are identified in the process area and the locations are identified on **Appendix D**.
3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.
2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D**.
3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H₂S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

**H₂S DETECTED GREATER THAN 10 PPM
&/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS
ACTIVATED**

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM**
(Operators are allowed under OSHA to work for up to 8 hours in 10ppm H₂S environment)
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H₂S LEVELS AT ASSEMBLY AREA VIA FIXED H₂S MONITOR READ OUT OR HAND HELD**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

**CALL 911
IF INJURY OR
DEATH
FOR EMERGENCY
ASSISTANCE**

**ONCE RESOLVED & MONITORED
LEVELS IN PLANT ARE LESS THAN 10
PPM RETURN TO PLANT**

**IF H₂S LEVELS AT ASSEMBLY AREA 1
EXCEED 10PPM**

EVACUATE TO ASSEMBLY AREA 2

**NOTIFY NMOCD WITHIN ONE HOUR
MAKE AGENCY REPORTS AS
NECESSARY**

AT ASSEMBLY AREA 2

- **ESTABLISH ROAD BLOCK OF PLANT ENTRANCE**
- **MONITOR H₂S LEVELS AT ASSEMBLY AREA VIA FIXED H₂S MONITOR READ OUT OR HAND HELD**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

**NOTIFY LEPC AND OTHER
PUBLIC OFFICIALS AND
EMERGENCY SUPPORT SERVICES**

LEVEL 2 RESPONSE

H₂S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- ALL OTHERS EVACUATE TO ASSEMBLY AREA 2
- ESTABLISH ROAD BLOCK TO PLANT ENTRANCE
- EVACUATE PRAXAIR, BHP AND ALL OTHERS WITHIN 500 PPM ROE
- NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE.
- NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

AT ASSEMBLY AREA #2

- MONITOR H₂S LEVELS AT ASSEMBLY AREA AND MONITOR H₂S LEVELS VIA FIXED H₂S MONITOR READ OUT OR HAND HELD
- IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)

CALL 911
IF INJURY OR
DEATH
FOR EMERGENCY
ASSISTANCE

ONCE RESOLVED & MONITORED
LEVELS IN PLANT ARE LESS THAN 10
PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- ACTIVATE FULL H₂S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)

NOTIFY NMOC WITHIN
ONE HOUR
MAKE OTHER AGENCY
REPORTS AS PER H₂S
PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- **ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 3**
- **ESTABLISH ROAD BLOCKS AS PER IMMEDIATE ACTION PLAN**
- **EVACUATE PRAXAIR AND ALL ENTITIES WITHIN 500 PPM ROE**
- **IMPLEMENT FULL H₂S PLAN WITH ALL NOTIFICATIONS**
- **NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES**

ONCE RESOLVED & MONITORED
LEVELS IN PLANT ARE LESS THAN 10
PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED**

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	Contact Person	Phone Number
El Paso Natural Gas Warehouse	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
El Paso Natural Gas Turbine Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy Salty Dog #1	2700 Farmington Ave. Farmington, NM 87401		505-324-1090

While BHP has no active vent shafts within the 500ppm ROE, they will be notified along with others entities contained within the 500ppm ROE to assure that no vents have been activated that would be affected. BHP contact information is below.

BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
-------------------	--	-------------------------------	----------------------------------

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	Contact Person	Phone Number
San Juan Co. Compaction and Transfer	141 County Rd 6500 Kirtland, NM 87417		505-334-4520
Phil Charlie	2 County Rd 6480 Kirtland, NM 87417		505-860-0602
Jennifer Tsosie	136 County Rd 6500 Kirtland, NM 87417		505-809-5145
San Juan Meats	118 County Rd 6500 Kirtland, NM 87417		505-598-5060
Angel Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-0372
Jamie Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-5129
Glen Hatch	106 County Rd 6500 Kirtland, NM 87417		505-598-1356
San Juan College West	69 County Road 6500 Kirtland, NM 87417		505-598-5897
El Paso Natural Gas Piggling Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
American Cell Tower	88 Rd 6500 Kirtland, NM 87417		877-518-6937
Central Consolidated School Bus Barn	76 County Rd 6500 Kirtland, NM 87417		505-598-0132
Hank's RV Park	72 County Rd 6500 Kirtland, NM 87417		505-325-7150
San Juan College	69 County Rd 6500 Kirtland, NM 87417		505-598-5897
Later Saints Church	10 County Rd 6523 Kirtland, NM 87417		505-598-5247 505-598-9297
BHP Mine Vent	300 County Rd 6900 Kirtland, NM 87417		505-598-5558
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140

All entities located within the 500 ppm ROE (listed above) are also located within the 100 ppm ROE and must be called when these entities are contacted.

**COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL**

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

**COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS**

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	911
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	911
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors – General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

OTHER PRODUCERS (which may be notified in the event of a Plant shut down)

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Loder milk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		http://weather.noaa.gov/weather/current/KF MN.html
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H₂S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office