H2S - 57

H2S CONTINGENCY PLAN

2009

H_2S 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 H_2S 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 *actua*l installation of the well, associated injection facilities and additional monitoring where and if applicable.

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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 "H_2S 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**

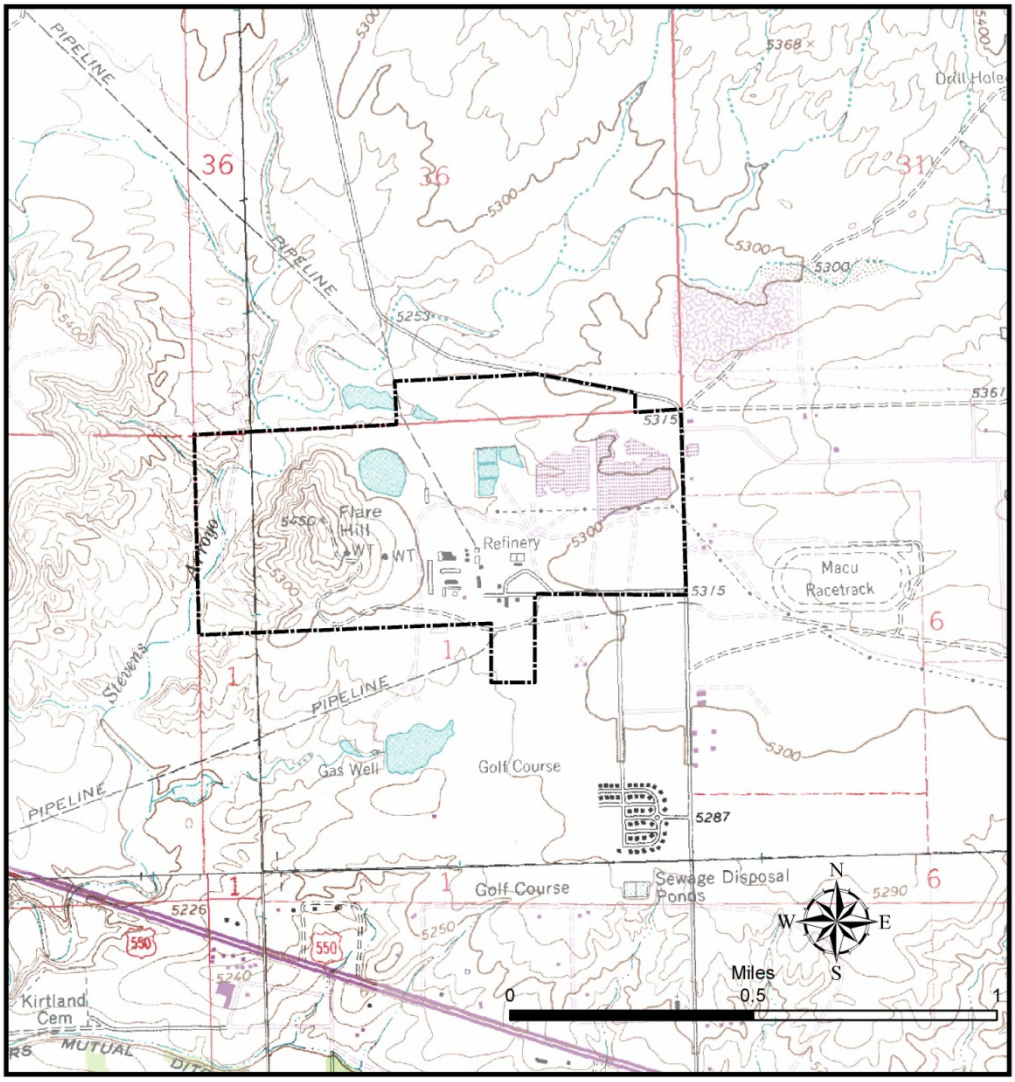
2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

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 (H_2S) 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S PLAN

The H_2S 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 H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 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 H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

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_2S
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		
ppm	**%**	**Physical Effect**
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 ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

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

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 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 H_2S 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 H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S 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 H_2S 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 H_2S 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 H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. A control panel in the Plant control room establishes which H_2S 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 H_2S perimeter monitor at Emergency Assembly Area 1 has a H_2S 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 H_2S 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 H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. In addition, a fixed H_2S perimeter monitor at Assembly Area 2 has a H_2S 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 H_2S 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 H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S levels at the Plant.

   c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 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 H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S 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 value 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 H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S 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 H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S 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 H_2S 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 6500and 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 H_2S/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.

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8. FIRST-AID STATION

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

FIRST AID KITS are located:

- **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 H_2S 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 H_2S 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 H_2S 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 H_2S certification. Medical clearance review for work in a H_2S 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

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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 CACULATION

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

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 H_2S 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
H_2S conc = 6000 ppm or 0.60 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(6000*.000001)*(50,000,000]^{0.6258}$$

500-ppm ROE = 1634 feet

100-ppm RADIUS OF EXPOSURE CALCULATION

$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$
$$[(1.589)*(6000*.000001)*(50,000,000)]^{0.6258}$$

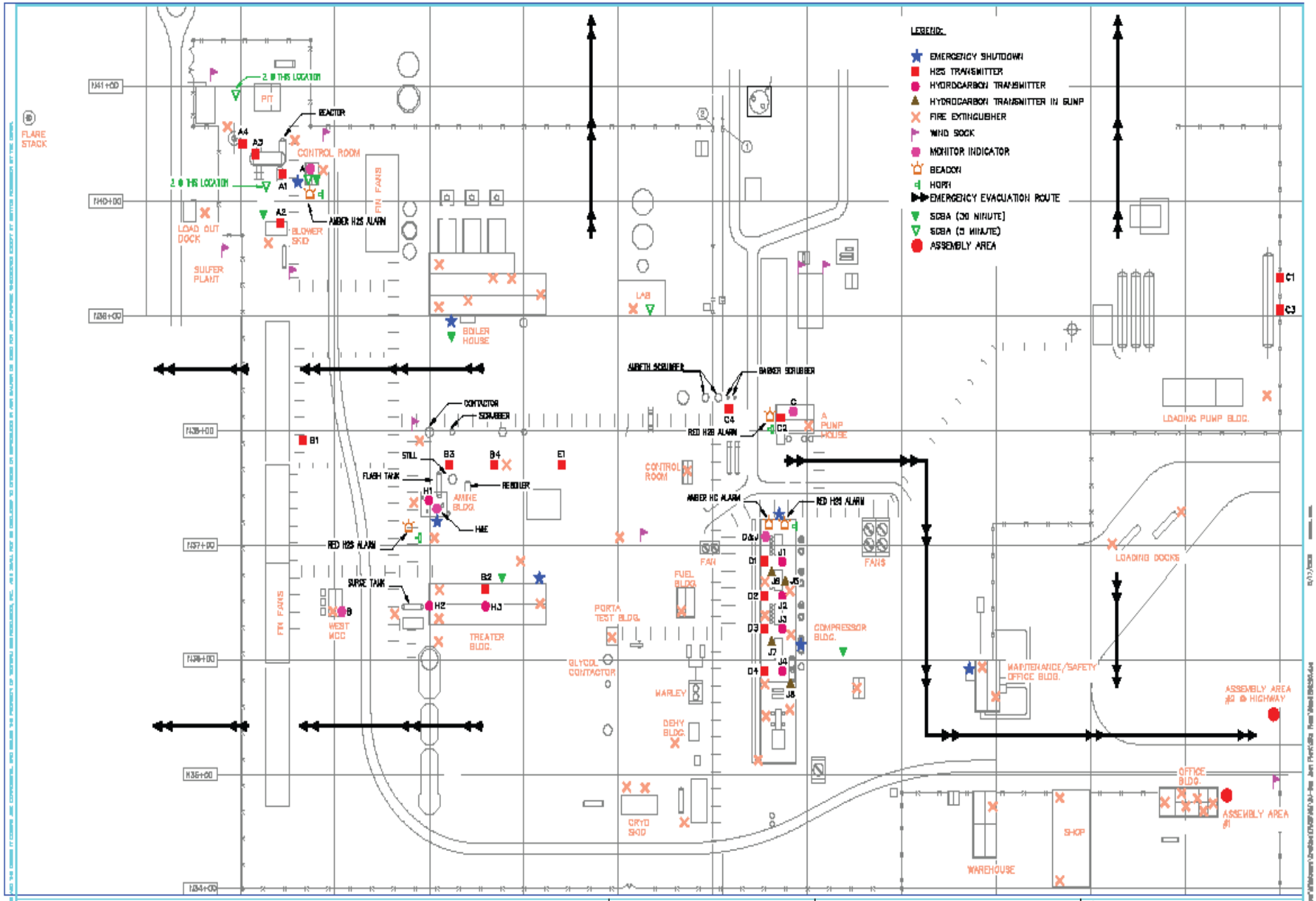
100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM RADIUS OF EXPOSURE MAP SHOWING LOCATION OF ADDITIONAL OFF-SITE H_2S MONITORS AND LOCATION OF ROADBLOCKS

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS



NOTES:

REFERENCE DRAWINGS	REVISIONS

Western Gas Resources, Inc.

SAN JUAN RIVER PLANT

EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT

APPENDIX E

DESCRIPTION OF H_2S 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 H_2S 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 values 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 H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S 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 H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S 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

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S 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 H_2S 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 H_2S 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 H_2S 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

H_2S 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 H_2S 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

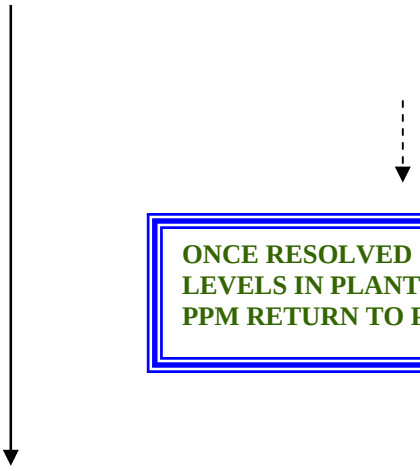
- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)**

NOTIFY NMOCD WITHIN ONE HOUR
MAKE OTHER AGENCY REPORTS AS PER H_2S 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 H_2S 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 Pigging 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 Lodermilk		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/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S 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

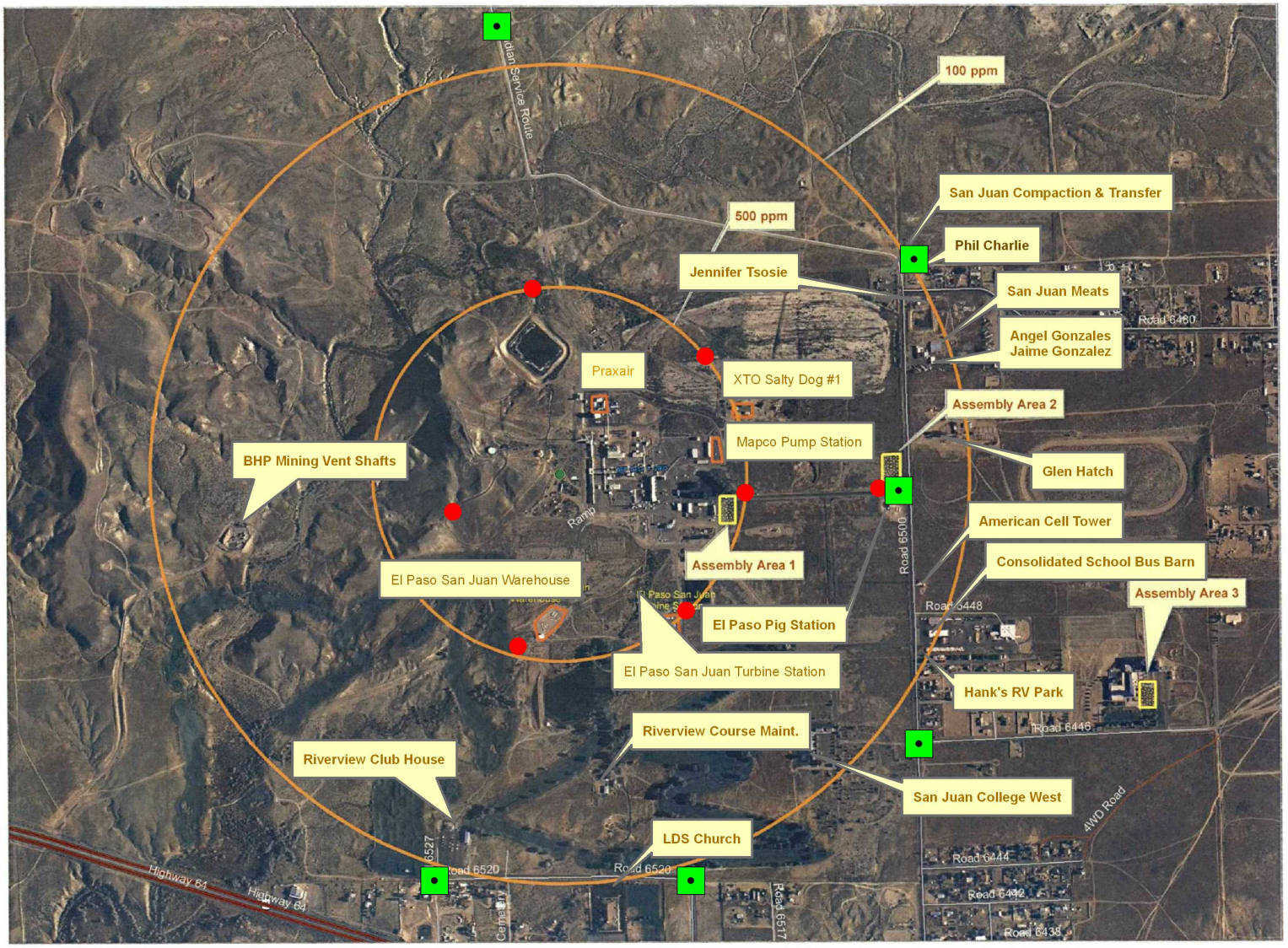
San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office



N
W E
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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 MMscfd @ 6000 ppm H_2S

- H_2S Monitors
- Road Blocks

Anadarko Petroleum Corporation

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

September 21, 2009

Ms. Kris Dixon
P.O. Box 6575
Farmington, New Mexico 87499

RE: Anadarko San Juan River Gas Plant (GW- 33) Contingency Plan
Anadarko Petroleum Corporation
Location: N/2 Section 1, Township 29 North, Range 15 West, NMPM
San Juan County, New Mexico

Dear Ms. Dixon:

The Oil Conservation Division (OCD) appreciates the concerns expressed in your email, dated September 17, 2009, to Mr. Glenn von Gonten of our Division. In response, the OCD wishes to inform you that it has completed a review of Anadarko Petroleum Corporation's (Anadarko) revised San Juan River Gas Plant Hydrogen Sulfide (H_2S) Contingency Plan, dated September 17, 2009, and has determined it to be adequate for the existing gas plant. Anadarko has submitted a H_2S contingency plan that demonstrates compliance with the applicable provisions of 19.15.11 NMAC. An electronic copy of the contingency plan and a hardcopy of the applicable rule (19.15.11 NMAC) are provided in this packet.

The OCD is awaiting a second submittal (an amendment) from Anadarko that will address the operation of the proposed acid gas injection well. The anticipated amendment should include recalculated radius of exposures, identification of the potentially impacted parties within the determined radii, amendments regarding additional notices, and the re-establishment of assembly and road block areas. The OCD will forward a copy of the amendment to you upon the completion of our review, if you wish.

If there are any questions regarding this matter, please do not hesitate to contact me at (505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Brad A. Jones
Environmental Engineer

BAJ/baj

Attachments: Electronic copy of contingency plan (dated September 17, 2009)
Hardcopy of 19.15.11 NMAC
Email Correspondence (dated September 17, 2009)

cc: OCD District III Office, Aztec

Jones, Brad A., EMNRD

From: VonGonten, Glenn, EMNRD
Sent: Monday, September 21, 2009 9:55 AM
To: Jones, Brad A., EMNRD
Subject: FW: Kirtland injection well... and "BLM opposes two injection wells"

From: KDIX@aol.com [mailto:KDIX@aol.com]
Sent: Thursday, September 17, 2009 2:15 PM
To: VonGonten, Glenn, EMNRD
Subject: Re: Kirtland injection well... and "BLM opposes two injection wells"

Glenn,
Thank you for the quick reply. I would like to see the revised plan.
My mailing address is
K Dixon, PO Box 6575, Farmington, NM 87499
Thanks so much.
Kris

In a message dated 9/17/2009 2:08:12 P.M. Mountain Daylight Time, Glenn.VonGonten@state.nm.us writes:

> Ms. Dixon,
>
> Case 14329 has been continued (postponed) until October 15, 2009. OCD has worked with Anadarko to ensure that its H2S Contingency Plan, as revised, will meet all the regulatory requirements. OCD does not plan to opposed the revised plan at the hearing. The revised plan is too large to email; however, I will send you a copy on a CD-ROM if you send me your mailing address.
>
> Glenn

From: KDIX@aol.com [mailto:KDIX@aol.com]
Sent: Thursday, September 17, 2009 1:56 PM
To: VonGonten, Glenn, EMNRD
Subject: Kirtland injection well... and "BLM opposes two injection wells"

Dear Mr. von Gonten,

I saw too late that Case 14329 is on today's docket. I hope that the Kirtland injection well will <u>not</u> be authorized.

The Kirtland installation is already deficient with no contingency plan on file since the plant was built.

This installation should be required to process the H2S onsite to reduce it to less hazardous elements or compounds so as not to endanger either the residents or add pollution to the ground by injecting it. I understand that a surface located process of reduction has not even been seriously considered. Shameful.

I don't understand why planning for the health and safety of the surrounding residents is not being addressed. The draft plan clearly lays out the exposure danger for workers. Eight hours at a very minimum exposure of 10 ppm is apparently considered a limit for workers. Higher levels are deadly, of course. This plant should probably not even be operating in this area at all.

The contingency draft you sent me for the injection well reads only to protect the company and employees. Very little is directed at protecting the area residents, even to the extent that only a few local people will be on the local notify list. But there is no indication in the plan that "immediate notification" of the area needs to be done. That location is just waiting for a disaster to happen. A catastrophic, especially nighttime, release would endanger the residents all the way down the slope to the river several miles away.

The draft contingency plan only addressed releases that were assumed would stay within or near the plant boundaries and not reach the residential areas that are very close to the plant ...and downhill ...and downwind. The plan also used only one point of release as the center. There are several points of potential release and I believe the calculations should have been based on a cumulative "cloud"area... or bubble plot... to draw the 100 ppm and 500 ppm radii around each of those potential release points. The discussion on the "Estimate of Atmospheric Dispersion" contains many points of reservation on the concentration estimation results. For instance: "Slight errors in the estimation of wind direction, especially under stable conditions when pollutant plumes are relatively narrow, can result in tremendous errors of concentration at specific locations. This is also the principal reason why so many hour-to-hour field concentration measurements relate rather poorly with concentration estimates." And, there is also the issue of "plume trapping" which with H2S is likely to be real since it is heavier than air and has a propensity to travel along the ground and would therefore not necessarily mix easily with the upper air layer.

Everything I read in the plan seemed to be calculated to minimize the potential problems instead of realistically stating and addressing a potential major release.

There is no area-wide alert procedure in the draft plan to inform or warn the residents immediately. The obvious intent of the plan was to keep knowledge of any releases private within the company and any required but delayed official state notification. In the event of a serious release, people could die and/or be injured unnecessarily purely as a result of this weak plan and lack of immediate notification.

Below is an article showing that even BLM is getting skittish about some types of injection wells.

If it is not too late for the hearing officers to receive information, I would appreciate it if you would forward these comments to them.

Thank you.

Kris Dixon

http://telluridenews.com/articles/2009/09/17/news/doc4ab1a0a09434e522049306.txt

BLM opposes two injection wells in west end

EnCana had hoped to inject some of its wastewater

By Matthew Beaudin

Published: Thursday, September 17, 2009 8:12 AM CDT

In the West, it always comes back to water. In this case, it's waste water from natural gas fields that's drawn some concern from regulators.

The Bureau of Land Management recently declined requests from EnCana Oil and Gas, Inc. that sought to allow the company to inject its wastewater — mostly saltwater — into the geologic formations in the Dry Creek Basin, near Basin, Colo.

EnCana is the premier operator in the region, with two oil and gas fields between here and Utah.

The BLM declined because the tests and operations could damage

groundwater resources, according to letters and an official.

Injection wells are a commonly used method to dispose of water from oil and gas operations. When companies mine for oil and natural gas, water is created as a waste product. In some situations, the companies will then "inject" the water back into the geologic formation it came from at a high pressure. The water is usually pushed 4,000 feet below ground level, and the rocks then take the water back and disperse it throughout the formation.

The fluid is mostly saltwater, according to the BLM, but can have trace amounts of metals from the rock formations below.

The wells, the BLM said, could affect aquifers in the Dry Creek Basin, which is anything but dry. "It is not dry. It's amazing," said Pamela Leschak, the San Juan Public Lands Center BLM fluids geologist. "There's a lot of good water resources."

In one case, EnCana wanted to run a test to see if injection would be effective and in another, they wanted to raise the level of injection from 4,000 to 2,000 feet because the rock they were currently using wasn't taking enough of the waste.

That, though, drew the concern of the BLM: even though there were no aquifers in the immediate area, the forced water could, they said, forge channels in the rocks and potentially contaminate water that is, at least now, used for livestock watering.

The formation in discussion is the Navajo Formation; it is, essentially, the rock that looks like a slickrock sea around Moab, Utah.

"It's a big, white sandstone formation all over the Four Corners that represents a big desert that was once here," Leschak said. "That formation probably would take the water, but it's shallow, and we're not comfortable with that."

EnCana, she said, may resubmit an application with more data.

"If the rock is weak... you could start to fracture that rock and fluids start moving... And that's our concern," she said. "That's everybody's concern."

Dave Schneck, San Miguel County's environmental health director, said the county had "great concerns" about the wells. "I'm happy they made that decision," he said of the BLM.

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

July 16, 2009

RE: Summary of the Review of the H_2S Contingency Plan
Anadarko San Juan River Gas Plant: GW- 33
Anadarko Petroleum Corporation
Location: N/2 Section 1, Township 29 North, Range 15 West, NMPM
San Juan County, New Mexico

The Oil Conservation Division (OCD) has reviewed Anadarko Petroleum Corporation's (Anadarko) San Juan River Gas Plant Hydrogen Sulfide (H_2S) Contingency Plan, dated July 8, 2009. Anadarko is required to submit a H_2S contingency plan that demonstrates compliance with the applicable provisions of 19.15.11 NMAC. The submittal has been determined to be incomplete. Therefore, the OCD requests additional information and modifications. Enclosed is a list of items that must be addressed prior to completing the review.

D. EMERGENCY NOTIFICATION, *1. Evacuation Plan*

In accordance with Subparagraph (a) of 19.15.11.B (2) NAMC, the contingency plan shall contain am immediate action plan as described in paragraph 7.6 of API RP-55. The immediate action plan is a separate plan required to be submitted within the contingency plan. The actions identified within subparagraphs (a) through (i) and their sequence recommended to be followed unless altered to fit the prevailing situation. Such actions as donning proper personal breathing equipment, assisting personnel in distress, and accounting for on-site personnel during the evacuation procedures, as identified in subparagraph (a) of paragraph 7.6 of API RP-55, are not identified with the proposed contingency plan.

The proposed plan does not identify H_2S and $S0_2$ concentrations levels provided in subparagraph (a) of paragraph 7.6 of API RP-55 to alert the public that a release of concern has occurred. These are maximum airborne concentrations below which nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action. The proposed plan does identify concentration levels in which certain activities should be initiated.

If there are any questions regarding this matter, please do not hesitate to contact me at (505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Brad A. Jones
Environmental Engineer

BAJ/baj

cc: OCD District III Office, Aztec

19.15.11 NMAC CHECKLIST
H2S CONTINGENCY PLAN FOR THE ANADARKO SAN JUAN RIVER GAS PLANT

TITLE 19 NATURAL RESOURCES AND WILDLIFE **CHAPTER 15 OIL AND GAS** **PART 11 HYDROGEN SULFIDE GAS** **19.15.11.7 7DEFINITIONS:**	
A. "ANSI" means the American national standards institute.	Anadarko has redefined certain definitions - *"Definitions used in this plan"*
B. "Area of exposure" means the area within a circle constructed with a point of escape at its center and the radius of exposure as its radius.	
C. "Dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of hydrogen sulfide gas in the atmosphere.	
D. "Escape rate" means the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth in 19.15.11 NMAC.	
(1) For existing gas facilities or operations, the escape rate is calculated using the **maximum daily rate of the gaseous mixture** produced or handled or the best estimate thereof. For an existing gas well, the escape rate is calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.	Anadarko failed to use the correct equation and failed to use the maximum daily rate.
(2) For new gas operations or facilities, the escape rate is calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate is calculated using the maximum open-flow rate of offset wells in the pool or reservoir, or the pool or reservoir average of maximum open-flow rates.	
(3) For existing oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate of the maximum daily production rate.	
(4) For new oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate of offset wells in the pool or reservoir, or the pool or reservoir average of the producing gas/oil ratio multiplied by the maximum daily production rate.	
(5) For facilities or operations not mentioned, the escape rate is calculated using the actual flow of the gaseous mixture through the system or the best estimate of the actual flow of the gaseous mixture through the system.	The SJRGP has been around since 1983 - it is an old facility and is permitted as GW033.

19.15.11 NMAC CHECKLIST
H2S CONTINGENCY PLAN FOR THE ANADARKO SAN JUAN RIVER GAS PLANT

E. "GPA" means the gas processors association.	
F. "LEPC" means the local emergency planning committee established pursuant to the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. section 11001.	
G. "NACE" means the national association of corrosion engineers.	
H. "Potentially hazardous volume" means the volume of hydrogen sulfide gas of such concentration that:	Anadarko's attempt to calculate the ROE in its own fashion means that it does not have a "Potentially hazardous volume."
(1) the 100-ppm radius of exposure includes a public area;	The 100-ppm ROE includes a "public area"
(2) the 500-ppm radius of exposure includes a public road; or	The 500-ppm ROE includes a "public road"
(3) the 100-ppm radius of exposure exceeds 3000 feet.	The 100-ppm ROE = 4924 feet.
I. "Public area" means a building or structure that is not associated with the well, facility or operation for which the radius of exposure is being calculated and that is used as a dwelling, office, place of business, church, school, hospital or government building, or a portion of a park, city, town, village or designated school bus stop or other similar area where members of the public may reasonably be expected to be present.	Anadarko's attempt to calculate the ROE in its own fashion means that it does not have a public area. OCD's calculation of the ROE indicate that a huge "public area" comes into play, extending into the Town of Kirtland.
J. "Public road" means a federal, state, municipal or county road or highway.	The ROE 100 PPM extends to south of HWY 64 and crosses several CRs.
K. "Radius of exposure" means the radius constructed with the point of escape as its starting point and its length calculated using the following Pasquill-Gifford derived equation, or by such other method as the division may approve:	Anadarko failed to use the specified equation and used a ridiculously small release volume of ~2300 cubic feet vs. the 5,000,000 cubic feet that it intends to inject.
(1) for determining the **100-ppm radius of exposure:** X = [(1.589)(hydrogen sulfide concentration)(Q)](0.6258), where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees fahrenheit);	X = [(1.589)(0.10)(5,000,000)]e(0.6258) **= 4924 feet for 100 ppm** Anadarko failed to document how it determined the H2S concentration that it refers to.

(2) for determining the **500-ppm radius of exposure:** X = [(0.4546)(hydrogen sulfide concentration)(Q)](0.6258), where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees fahrenheit);	X = [(0.4546)(0.10)(5,000,000)]e(0.6258) **= 2250 feet for 500 ppm**
(3) for a well being drilled, completed, recompleted, worked over or serviced in an area where insufficient data exists to calculate a radius of exposure but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100-ppm radius of exposure equal to 3000 feet is assumed.	DNA for Class I injection well
19.15.11.8 REGULATORY THRESHOLD:	
A. Determination of hydrogen sulfide concentration.	
(1) Each person shall determine the hydrogen sulfide concentration in the gaseous mixture by testing a sample from each well, facility or operation; testing a representative sample; or using process knowledge in lieu of testing.	Anadarko specifies that the H2S is 10% (100,000 ppm) but does not specify how it determined this concentration.
(2) The person shall conduct the tests in accordance with applicable ASTM or GPA standards or by another division-approved method.	
(3) If the person conducted a test prior to January 31, 2003 that otherwise meets the requirements of Paragraphs (1) and (2) of Subsection A of 19.15.11.8 NMAC, new testing is not required.	
(4) If a change or alteration occurs operators shall make a new determination	
B. Concentrations determined to be below 100 ppm. If less than 100 ppm, the person is not required to take further actions pursuant to 19.15.11 NMAC.	
C. Concentrations determined to be above 100 ppm.	
(1) If the person determines the hydrogen sulfide concentration in a given well, facility or operation is 100 ppm or greater, then the person shall calculate the radius of exposure and comply with applicable requirements of 19.15.11 NMAC.	Anadarko has improperly calculated the ROE.
(2) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide results of the hydrogen sulfide concentration determination and the calculation of the radius of exposure to the division. For a well, facility or operation, the person shall accomplish the determination, calculation and	

submission 19.15.11.8 NMAC requires before operations begin.	
D. Recalculation. The person shall calculate the radius of exposure if the hydrogen sulfide concentration in a well, facility or operation increases to 100 ppm or greater. The person shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of 25 percent in a well, facility or operation that previously had a hydrogen sulfide concentration of 100 ppm or greater. If calculation or recalculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide the results to the division within 60 days.	
19.15.11.9 HYDROGEN SULFIDE CONTINGENCY PLAN:	Anadarko's application indicates that it is submitting a "Draft" Contingency Plan - not acceptable
A. When required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, the person shall develop a hydrogen sulfide contingency plan that the person will use to alert and protect the public in accordance with the Subsections B through I of 19.15.11.9 NMAC.	
B. Plan contents.	
(1) API guidelines. The person shall develop the hydrogen sulfide contingency plan with due consideration of paragraph 7.6 of the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, most recent edition, or with due consideration to another division-approved standard.	
(2) Required contents. The hydrogen sulfide contingency plan shall contain information on the following subjects, as appropriate to the well, facility or operation to which it applies.	
(a) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures the person will follow in the event of a release and shall include, at a minimum, information concerning the responsibilities and duties of personnel during the emergency, an immediate action plan as described in the API document referenced in Paragraph (1) of Subsection B of 19.15.11.9 NMAC, and telephone numbers of emergency responders, public agencies, local government and other appropriate public authorities. The plan shall also include the locations of potentially affected public areas and public roads and shall describe proposed evacuation routes, locations of road blocks and procedures for notifying the public,	

either through direct telephone notification using telephone number lists or by means of mass notification and reaction plans. The plan shall include information on the availability and location of necessary safety equipment and supplies.	
(b) Characteristics of hydrogen sulfide and sulfur dioxide. The hydrogen sulfide contingency plan shall include a discussion of the characteristics of hydrogen sulfide and sulfur dioxide.	
(c) Maps and drawings. The hydrogen sulfide contingency plan shall include maps and drawings that depict the area of exposure and public areas and public roads within the area of exposure.	
(d) Training and drills. The hydrogen sulfide contingency plan shall provide for training and drills, including training in the responsibilities and duties of essential personnel and periodic on-site or classroom drills or exercises that simulate a release, and shall describe how the person will document the training, drills and attendance. The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate on the proper protective measures to be taken in the event of a release, and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans.	
(e) Coordination with state emergency plans. The hydrogen sulfide contingency plan shall describe how the person will coordinate emergency response actions under the plan with the division and the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan.	
(f) Activation levels. The hydrogen sulfide contingency plan shall include the activation level and a description of events that could lead to a release of hydrogen sulfide sufficient to create a concentration in excess of the activation level.	
C. Plan activation. The person shall activate the hydrogen sulfide contingency plan when a release creates a hydrogen sulfide concentration greater than the activation level set forth in the hydrogen sulfide contingency plan. **At a minimum, the person shall activate the plan whenever a release may create a hydrogen sulfide concentration of more than 100 ppm in a public area, 500 ppm at a public road or 100 ppm 3000 feet from the site of release.**	Anadarko's ROE, when correctly calculated, includes a public area and a public road. The 100-ppm ROE exceeds 3000 feet.
D. Submission.	
(1) Where submitted. The person shall submit the hydrogen sulfide contingency plan	

to the division.	
(2) When submitted. The person shall submit a hydrogen sulfide contingency plan for a new well, facility or operation before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation shall be on file with the division before operations commence and may be submitted separately or along with the APD or may be on file from a previous submission. A person shall submit a hydrogen sulfide contingency plan within 180 days after the person becomes aware or should have become aware that a public area or public road is established that creates a potentially hazardous volume where none previously existed.	
(3) Electronic submission. A filer who operates more than 100 wells or who operates an oil pump station, compressor station, refinery or gas plant shall submit each hydrogen sulfide contingency plan in electronic format. The file may submit the hydrogen sulfide contingency plan through electronic mail, through an Internet filing or by delivering electronic media to the division, so long as the electronic submission is compatible with the division's systems.	Anadarko failed to submit its application in electronic format.
E. Failure to submit plan. A person's failure to submit a hydrogen sulfide contingency plan when required may result in denial of an application for permit to drill, cancellation of an allowable for the subject well or other enforcement action appropriate to the well, facility or operation.	
F. Review, amendment. The person shall review the hydrogen sulfide contingency plan any time a subject addressed in the plan materially changes and make appropriate amendments. If the division determines that a hydrogen sulfide contingency plan is inadequate to protect public safety, the division may require the person to add provisions to the plan or amend the plan as necessary to protect public safety.	
G. Retention and inspection. The hydrogen sulfide contingency plan shall be reasonably accessible in the event of a release, maintained on file at all times and available for division inspection.	
H. Annual inventory of contingency plans. On an annual basis, each person required to prepare one or more hydrogen sulfide contingency plans pursuant to 19.15.11 NMAC shall file with the appropriate local emergency planning committee and the state emergency response commission an inventory of the wells, facilities and operations for which plans are on file with the division and the name, address and telephone number of a point of contact.	

19.15.11 NMAC CHECKLIST
H2S CONTINGENCY PLAN FOR THE ANADARKO SAN JUAN RIVER GAS PLANT

I. Plans required by other jurisdictions. The person may submit a hydrogen sulfide contingency plan the BLM or other jurisdiction require that meets the requirements of 19.15.11.9 NMAC to the division in satisfaction of 19.15.11.9 NMAC.	
19.15.11.10 SIGNS, MARKERS:	
For each well, facility or operation involving a hydrogen sulfide concentration of 100 ppm or greater, the person shall install and maintain signs or markers that conform with the current ANSI standard Z535.1-2002 (Safety Color Code), or some other division-approved standard. The sign or marker shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. The person shall prominently post signs or markers at locations, including entrance points and road crossings, sufficient to alert the public that a potential danger exists.	
19.15.11.11 PROTECTION FROM HYDROGEN SULFIDE DURING DRILLING; COMPLETION, WORKOVER AND WELL SERVICING OPERATIONS:	
A. API standards. The person shall conduct drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publications Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide, RP-68, and Recommended Practices for Drilling and Well Servicing Operations Involving Hydrogen Sulfide, RP-49, most recent editions, or some other division-approved standard.	
B. Detection and monitoring equipment. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include hydrogen sulfide detection and monitoring equipment as follows.	
(1) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the hydrogen sulfide's ambient air concentration reaches a predetermined value the operator sets, not to exceed 20 ppm. The operator shall locate a sensing point at the shale shaker, rig floor and bell nipple for a drilling site and the cellar, rig floor and circulating tanks or shale shaker for a completion site.	

(2) For workover and well servicing operations, the person shall locate one operational sensing point as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.	
(3) The operator shall provide and maintain as operational hydrogen sulfide detection and monitoring equipment during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.	
C. Wind indicators. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. The person shall have equipment to indicate wind direction present and visible at all times. The person shall install at least two devices to indicate wind direction at separate elevations that visible from all principal working areas at all times. When a sustained hydrogen sulfide concentration is detected in excess of 20 ppm at a detection point, the person shall display red flags.	
D. Flare system. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous hydrogen sulfide volume will be encountered, the person shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. The person shall locate flare outlets at least 150 feet from the well bore. Flare lines shall be as straight as practical. The person shall equip the flare system with a suitable and safe means of ignition. Where noncombustible gas is to be flared, the system shall provide supplemental fuel to maintain ignition.	
E. Well control equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment is required.	
(1) Drilling. The person shall install a remote-controlled well control system that is operational at all times beginning when drilling is within 500 vertical feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system shall include, at a minimum, a pressure and hydrogen-sulfide-rated well control choke and kill system including manifold and blowout preventer that meets or exceeds the specifications in API publications Choke and Kill Systems, 16C and Blowout Prevention Equipment Systems for Drilling Wells, RP 53 or other division-approved specifications. The person shall use mud-gas separators. The person shall test and maintain these systems pursuant to the specifications referenced, according to the requirements of 19.15.11 NMAC, or as the	

division otherwise approves.	
(2) Completion, workover and well servicing. The person shall install a remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other division-approved specifications that is operational at all times during a well's completion, workover and servicing.	
F. Mud program. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall use a hydrogen sulfide mud program capable of handling hydrogen sulfide conditions and well control, including de-gassing.	
G. Well testing. Except with prior division approval, a person shall conduct drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater only during daylight hours and not permit formation fluids to flow to the surface.	
H. If hydrogen sulfide encountered during operations. If hydrogen sulfide was not anticipated at the time the division issued a permit to drill but is encountered during drilling in a concentration of 100 ppm or greater, the operator shall satisfy the requirements of 19.15.11 NMAC before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that the operator has or is taking as soon as possible, but no later than 24 hours following discovery. The division may grant verbal approval to continue drilling operations pending preparation of a required hydrogen sulfide contingency plan.	
19.15.11.12 PROTECTION FROM HYDROGEN SULFIDE AT OIL PUMP STATIONS, PRODUCING WELLS, TANK BATTERIES AND ASSOCIATED PRODUCTION FACILITIES, PIPELINES, REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS:	
A. API standards. A person shall conduct operations at oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, latest edition or some other division-approved standard.	

B. Security. A person shall protect well sites and other unattended, fixed surface facilities involving a hydrogen sulfide concentration of **100 ppm or greater from public access by fencing with locking gates when the location is within 1/4 mile of a public area.** For the purposes of Subsection B of 19.15.11.12 NMAC, a surface pipeline is not considered a fixed surface facility.	Anadarko must address this requirement.
C. Wind direction indicators. Oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater shall have equipment to indicate wind direction. The person shall install wind direction equipment that is visible from all principal working areas at all times.	
D. Control equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required.	
(1) The person shall install and maintain in good operating condition safety devices, such as automatic shut-down devices, to prevent hydrogen sulfide's escape. Alternatively, the person shall establish safety procedures to achieve the same purpose.	
(2) A well shall possess a secondary means of immediate well control through the use of an appropriate christmas tree or downhole completion equipment. The equipment shall allow downhole accessibility (reentry) under pressure for permanent well control.	
E. Tanks or vessels. The person shall chain each stair or ladder leading to the top of a tank or vessel containing 300 ppm or more of hydrogen sulfide in the gaseous mixture or mark it to restrict entry.	
19.15.11.13 PERSONNEL PROTECTION AND TRAINING:	
The person shall provide persons responsible for implementing a hydrogen sulfide contingency plan training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.	
19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE:	
Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE	

Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide's corrosive effects.	
19.15.11.15 EXEMPTIONS:	
A person may petition the director or the director's designee for an exemption to a requirement of 19.15.11 NMAC. A petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the person will protect public safety. The director or the director's designee, after considering all relevant factors, may approve an exemption if the circumstances warrant and so long as the person protects public safety.	
19.15.11.16 NOTIFICATION OF THE DIVISION:	
The person shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan as soon as possible, but no more than four hours after plan activation, recognizing that a prompt response should supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.	
C-108 REQUIREMENTS	
XIV. PROOF OF NOTICE All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location. Where an application is subject to **administrative approval**, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located.	Anadarko refers to DRAFT notice in its application and indicates that it will provide notice at least 20 days before the hearing and will provide affidavits at the hearing.
OTHER ISSUES - GW033	3107C. The discharger shall notify the secretary of any facility expansion, production increase or process modification

	that would result in any significant modification in the discharge of water contaminants. (see Permit Condition 5).
	Anadarko did not comply with Permit Condition 21 - it failed to notify OCD that it had taken over operations of the San Juan River Gas Plant from Western Gas Resources.
OTHER ISSUES - BHP COAL MINE	Any release of H2S would endanger the coal miners - Anadarko's H2S Contingency Plan does not address this.