



# H<sub>2</sub>S CONTINGENCY PLAN

Celero Energy II LP  
Caprock Field Area  
Chaves & Lea Cos.  
New Mexico  
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## I. INTRODUCTION

This plan covers Caprock Area operations involving hydrogen sulfide which are subject to the provisions of New Mexico Oil Conservation Rule #118. Celero-operated leases covered under this plan are the Rock Queen Unit (RQU), Drickey Queen Sand Unit (DQSU), West Cap Queen Sand Unit (WCQSU), Trigg Federal Lease, Zimmerman Federal Lease, N. M. Federal "V" Lease, Karankawa Federal Lease, and the Wakan Tanka Federal Lease.

Fixed monitors have been installed to detect the release of H<sub>2</sub>S before the gas reaches the concentrations which could endanger public areas. A 24-hour call out service has also been established to report emergencies. This number for this service is. (800)-586-6909.

## II. PURPOSE

The purpose of this plan is to provide procedures for the logical, efficient, and safe action necessary by all Caprock personnel to protect the general public and employees in the event of an accidental release of a potentially hazardous quantity of hydrogen sulfide (H<sub>2</sub>S) gas.

## III. EMERGENCY ACTIONS

The employee discovering or detecting the release of a potentially hazardous volume of H<sub>2</sub>S immediately activates this contingency plan by initiating and carrying out the following actions:

- A. Notify the supervisor in charge of the affected facility and request emergency assistance.
- B. Summarize the nature and severity of the incident. Include injuries to personnel, any special equipment needed, and/or precautions to take when approaching the scene.
- C. Request additional assistance. Rescue and provide first aid to any injured personnel only if you are properly trained and can do so without compromising your personal safety.
- D. The Supervisor at the scene will coordinate the activities at the scene to include requesting additional equipment or assistance as needed and assessing the need for roadblocks, public evacuation, and/or downwind monitors.

A potentially hazardous volume of H<sub>2</sub>S is defined as one which could result in a ground level concentration of 10 ppm or higher where people are known or expected to be.

Special Warning to Employees. In the event of the release of a potentially dangerous volume of H<sub>2</sub>S, it is likely that some employees at these locations will be exposed earlier and to higher concentrations of H<sub>2</sub>S than the general public. Even more likely is a gas release which is not large enough to endanger the general public but still large enough to pose a hazard to employees. Caprock employees, by virtue of their special training and knowledge of the potential hazards, should be alert and take appropriate precautions to protect themselves. This plan should be applied to employee safety as well as to the safety of the public.

- E. The Supervisor at the office directs phone calls for emergency services such as an ambulance, the fire department, and the police. The Supervisor shall also provide directions to emergency services, and assign someone to manage incoming calls. The Supervisor will designate a staging area and proceed to the staging area to direct: employee assignments, public evacuation, roadblocks, equipment movement, personnel to monitor downwind H<sub>2</sub>S concentrations, and the manner in which to deal with the news media or curiosity seekers. The Supervisor will notify Celero Management and various regulatory agencies as required. The Caprock Area "Emergency Response Plan" can be activated if warranted.
- F. All employees shall refrain from using the telephone as much as possible during the emergency. If at the incident scene, use your best judgment to assist by rendering aid, spotting for emergency vehicles, etc. If you are not near the scene, report to the staging area for instructions unless otherwise directed by a supervisor. Emergency phone lists and contractor lists can be found in the "Emergency Response Plan" and are attached as Exhibit 6.

- G. Alert and evacuate the people within the exposure area. Once the escape of H<sub>2</sub>S has been stopped completely, begin monitoring evacuated areas for H<sub>2</sub>S and combustible gas concentrations. When total absence of H<sub>2</sub>S and combustible gas is confirmed throughout the evacuated area, notify the local law enforcement officials so that evacuees can return to the area. Advise all parties previously notified that the emergency has ended.

#### **IV. POST-EMERGENCY ACTIONS**

In the event this plan is ever activated, the following post-emergency actions shall be taken in an effort to reduce the possibility of a recurrence of the type of problem that required its activation and to assure that any future activation will be as effective as possible:

- A. Clean up, recharge, restock, repair, and replace emergency equipment as necessary and return it to its original location.
- B. Critique all actions and procedures. Identify and provide additional training to employees as need is indicated.
- C. Review the cause of the emergency and modify operating, maintenance, and surveillance procedures as warranted.

#### **V. NON-CELERO OPERATOR EMERGENCY**

In the event that an employee of Caprock Area discovers a potentially hazardous leak from a pipeline or other facility that is not maintained by Celero, the employee should lend assistance without endangering himself. Generally, such assistance would include the following actions:

- A. Alert and assist any persons in immediate danger.
- B. Notify your supervisor of the emergency.
- C. Notify the owner/operator of the pipeline or other facility, if possible.

#### **VI. POTENTIAL EXPOSURE AREAS AND CONDITIONS**

The New Mexico Oil Conservation Rule #118 specifically indicates concern with the 100 and 500 ppm radius of exposure. The "radius of exposure" is the contaminated area around the incident site that contains a specific (or greater) concentration of H<sub>2</sub>S. A chart of the 100 ppm and 500 ppm exposure areas for various Caprock facilities is included as Exhibit 1. These levels are singled out because of the increasingly toxic effects on people as shown in Exhibit 4. Monograms to quickly determine the estimated 100 ppm and 500 ppm radius of exposure are also provided as Exhibits 2 and 3. Everyone involved in H<sub>2</sub>S safety must be aware that the results of the exposure radius calculations are not precise, "life or death" decisions shall not be made on that basis that they are precise.

#### **VII. PRE-EMERGENCY ACTIONS**

The key part of this plan are the emergency actions of Section III. However, pre-emergency measures are extremely, if not equally, important. It is not considered necessary to review in detail all appropriate pre-emergency actions since most of them are generally on-going, common sense activities. The following minimum actions are suggested but are not meant to be all-inclusive:

- A. Conduct surveillance and preventative maintenance to minimize the possibility of an accidental release of gas,
- B. Conduct annual training of employees in H<sub>2</sub>S characteristics, detection, breathing apparatus use and maintenance,
- C. Test the contingency plan with annual hypothetical drills,
- D. Make training records available to public agencies having authority to request it, and
- E. Assure the readiness of emergency equipment.

#### **VIII. NEWS MEDIA INQUIRIES**

The news media will get involved any time the public is affected in an emergency situation. Celero's policy is to have an Officer of the Company coordinate the Company's response to any news media inquiry. The news media will not be allowed into an affected area if the danger of H<sub>2</sub>S still exists. Once the danger has been eliminated, media personnel may only enter the affected area accompanied by a Celero representative and then only after approval is received from an Officer of the Company.

## IX. EMPLOYEE H<sub>2</sub>S EMERGENCY ACTION PROCEDURES

The average H<sub>2</sub>S concentration in produced gas may be 20,000 ppm, the tank headspace concentrations may exceed 35,000 ppm, and the water injected may be as much as 60,000 ppm. In order to ensure the safety of the employee and the public, fixed H<sub>2</sub>S monitors have been installed at all production batteries, production satellites, drilling well sites, and on workover rigs. It is important to note that these fixed alarms supplement but are not intended to replace the protection afforded by personal H<sub>2</sub>S monitors. Ask your supervisor if you have any questions concerning what to do when working in an H<sub>2</sub>S environment.

This emergency action procedure was written to address what actions each employee must take when working in an H<sub>2</sub>S environment or when responding to an H<sub>2</sub>S emergency. If the emergency could endanger the public, the employee should immediately notify the appropriate supervisor and begin implementing the emergency actions required in this plan.

## X. PERSONAL H<sub>2</sub>S MONITOR - ACTION PROCEDURES

Each employee in the Caprock area must wear a personal H<sub>2</sub>S monitor at all times while working in the field. Personal monitors are set to alarm at 10 ppm because respiratory protection is mandatory when working in an area containing 10 ppm or more H<sub>2</sub>S. When a personal monitor alarms, the following action must be taken:

- A. Immediately evacuate the area. Move upwind or at right angles to upwind depending on the location of the exit and the location of the source of the H<sub>2</sub>S.
- B. You may approach the suspected area with a personal monitor only after donning a **Self-Contained Breathing Apparatus(SCBA)**.
- C. An atmospheric check will be conducted by a qualified person. Should the H<sub>2</sub>S concentration reach 300 ppm, immediately evacuate the area and notify your supervisor. At this point, entry into the area is prohibited until a standby worker arrives. The standby worker must put on a **SCBA** and have access to a cell phone to call for help should an emergency arise.

## XI. FIXED H<sub>2</sub>S MONITOR - ACTION PROCEDURES

The primary purpose of fixed H<sub>2</sub>S monitors is to ensure the safety of the public and to warn an employee of a release of H<sub>2</sub>S. Fixed monitors were not installed to eliminate the need to carry a personal monitor.

At drilling and workover well sites, production batteries, and satellites the alarm will activate as evidenced by a flashing light when the H<sub>2</sub>S concentration reaches 10 ppm. The flashing light warns that the H<sub>2</sub>S concentration is 10 ppm OR MORE in the area and that safety precautions **MUST BE** taken.

**Self-Contained Breathing Apparatus(SCBA)** is **mandatory** before entering any facility or well site if the fixed H<sub>2</sub>S monitor alarm is sounding or flashing regardless of the reading on the personal monitor.

**ACTION PROCEDURE** - Light is flashing (H<sub>2</sub>S is present in concentrations greater than 10 ppm)

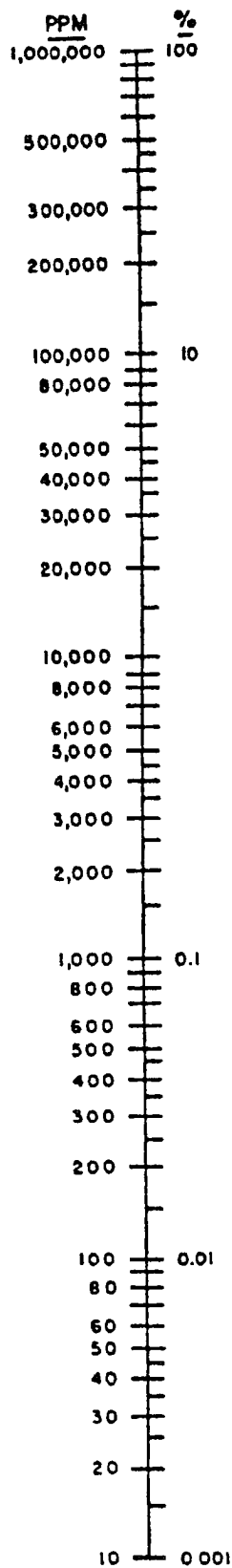
1. Note the wind direction by looking at a windsock. Plan an evacuation route based on the location of the exits, the wind direction, and the potential location of the H<sub>2</sub>S leak.
2. Enter the facility while monitoring the H<sub>2</sub>S concentration on the personal monitor. If at any time the personal monitor alarms, leave the area and don a **SCBA** before re-entry. A standby worker is **mandatory** if the H<sub>2</sub>S concentration in the area is 300 ppm or greater. NOTE: The action procedures listed above for "Personal H<sub>2</sub>S Monitor Alarms" always take precedent. **Never do anything which compromises personal safety!**
3. At tank batteries, locate the source of the H<sub>2</sub>S by checking the H<sub>2</sub>S control panel and finding the sensor(s) causing the alarm.
4. Approach the suspected source of the H<sub>2</sub>S from upwind, monitoring the H<sub>2</sub>S concentration on the personal monitor.
5. Take action to eliminate the source of the H<sub>2</sub>S.

# EXHIBIT 1

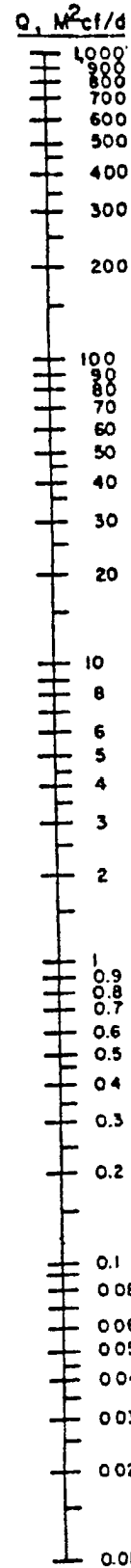
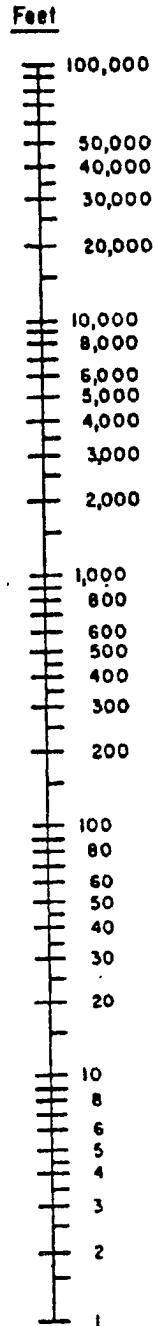
## CAPROCK FIELD AREA H<sub>2</sub>S RADIUS OF EXPOSURE

Location	DATE	SAMPLING POINT	Hydrogen Sulfide Concentration ppm	Estimated Zero Back pressure FLOW RATE cubic feet/day	Estimated Zero Back pressure FLOW RATE mcf/day	Estimated Zero Back pressure FLOW RATE mmcf/day	100 ppm Radius of Exposure-feet from source	500 ppm Radius of Exposure-feet from source
RQU Common Bat & Satellite 1	9/7/2010	Separator	3.4	27,000	27.0	0.0270	<1.0	<1.0
RQU Satellite 20	9/7/2010	Separator	50.0	6,000	6.0	0.0060	<1.0	<1.0
RQU Satellite 13	9/7/2010	Separator	40.0	6,000	6.0	0.0060	<1.0	<1.0
RQU Satellite 11	9/7/2010	Separator	12,107	27,000	27.0	0.0270	50.0	23.0
DQSU Battery 2	2/24/2009	Separator	10,080	800	0.8	0.0008	5.0	2.0
DQSU Battery 3	12/16/2010	Separator	0.0	3,200	3.2	0.0032	N/A	N/A
DQSU Battery 1 (under constr)	N/A	N/A	est. 10080	6,000	6.0	0.0060	17.0	8.0
WCQSU Battery	12/16/2010	Separator	0.0	1,000	1.0	0.0010	N/A	N/A
Trigg Federal Battery	12/16/2010	Separator	10.0	1,400	1.4	0.0014	<1.0	<1.0
Wakan Tanka/Karankawa Battery	12/16/2010	Separator	0.1	3,000	3.0	0.0030	<1.0	<1.0

**EXHIBIT 2**  
**100 ppm H<sub>2</sub>S**  
**EXPOSURE RADIUS NOMOGRAM**



**HYDROGEN SULFIDE**  
**100 PPM EXPOSURE RADIUS**



At X = 3000 Ft.  
 Q = 226,547 PPM

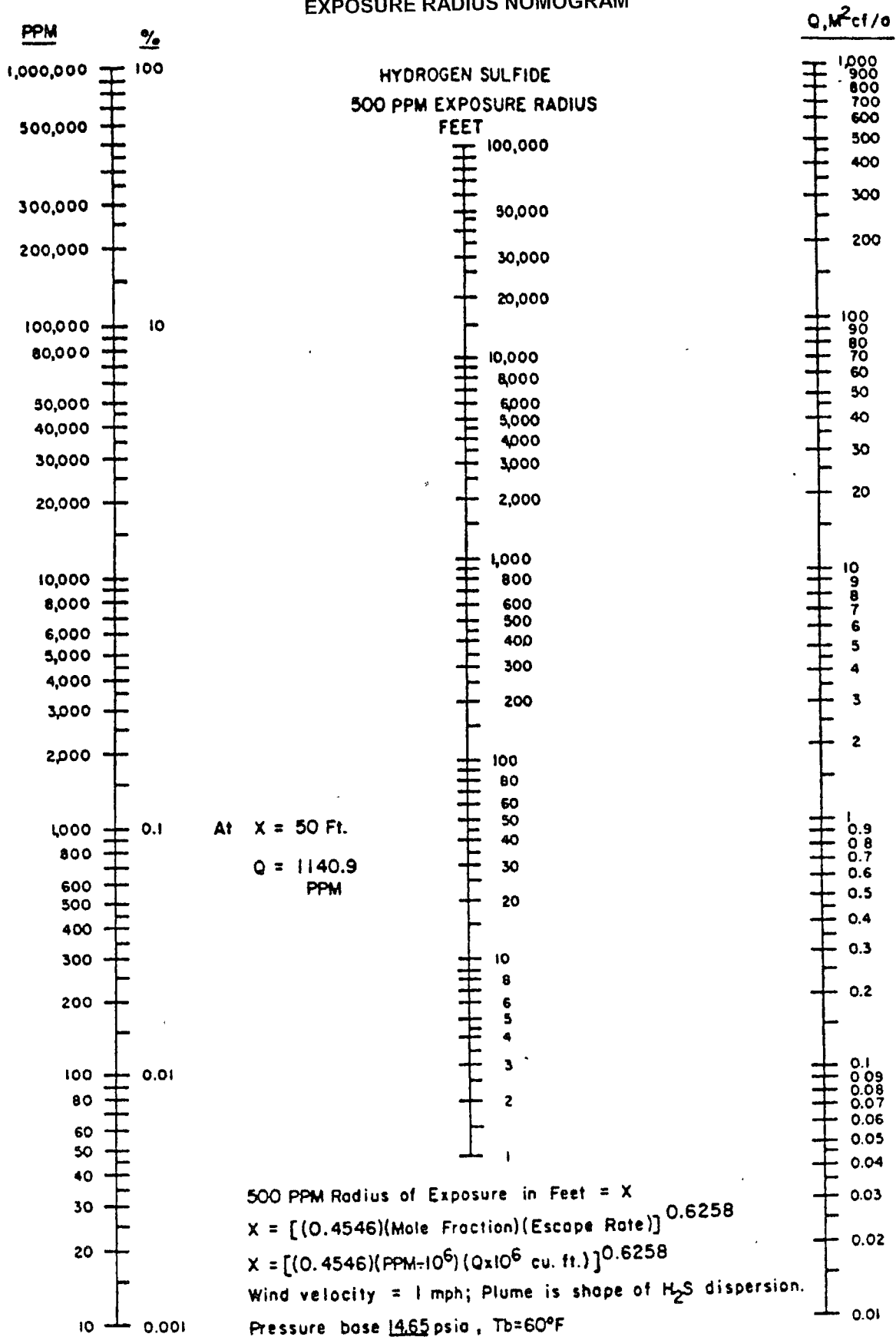
At X = 50 Ft.  
 Q = 326.4 PPM

Below 100 PPM  
 Rule 36 N.A.

$$\begin{aligned}
 &100 \text{ PPM Radius of Exposure in Feet} = X \\
 &X = [(1.589)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258} \\
 &= [(1.589)(\text{PPM})(Q \text{ in M}^2\text{cf/d})]^{0.6258}
 \end{aligned}$$

P<sub>b</sub> 14.65 psia T 60 °F

**EXHIBIT 3**  
**500 ppm H<sub>2</sub>S**  
**EXPOSURE RADIUS NOMOGRAM**





## **EXHIBIT 4**

### **H<sub>2</sub>S TOXICITY AND CHARACTERISTICS**

#### **TOXICITY**

- 1 ppm The odor of rotten eggs can be smelled clearly.
- 10 ppm Because of wide variations in individual susceptibility, a small percentage of individuals may experience discomfort from H<sub>2</sub>S at or below this concentration. The maximum time that an individual may be exposed to this concentration is eight hours.

#### **OVER 10 PPM, PROTECTIVE EQUIPMENT WILL BE NECESSARY**

- 15 ppm Short term exposure limit is 15 minutes.
- 100 ppm At this level, H<sub>2</sub>S will kill the sense of smell within three to fifteen minutes and it may burn the eyes and throat. The effects will be a slight headache or upset stomach and an increase in the pulse rate. Irritation of the eyes, throat, and skin are also possible.
- 200 ppm Kills sense of smell rapidly and burns eyes and throat.

#### **OVER 300 PPM, A STANDBY WORKER IS REQUIRED**

- 500 ppm The gas attacks the nerve center in the brain resulting in a loss of reason and balance. Will lead to stoppage of breathing within 15 minutes or less. At this point, the victim needs prompt artificial respiration.
- 700 ppm The victim will become unconscious quickly. Breathing will stop and death will result if not rescued promptly. Immediate artificial resuscitation is necessary.
- 1000 ppm The victim will become unconscious at once. Breathing will stop and death will result if not rescued promptly. Immediate artificial resuscitation is necessary.

## H<sub>2</sub>S CHARACTERISTICS

1. Extremely toxic ranking second to Hydrogen Cyanide; five (5) to six (6) times more toxic than Carbon Monoxide.
2. Colorless.
3. Offensive odor often described as that of rotten eggs.
4. Heavier than air. Specific gravity 1.189 (Air = 1.00 @ 60°F). Vapors may travel considerable distance to a source of ignition and flashback.
5. Forms an explosive mixture with air in concentrations between 4 and 46 volume percent.
6. Auto-ignition point of 500°F.
7. Burns with a blue flame and produces sulfur dioxide (SO<sub>2</sub>) which is as toxic as H<sub>2</sub>S and can cause serious injury to eyes and lungs.  

Sulfur Dioxide (SO<sub>2</sub>): Specific Gravity = 2.21 (air=1.0); Threshold Limit Value = 2 ppm  
Lethal Concentration = 1000 ppm
8. Soluble in both water and liquid hydrocarbons.
9. Produces irritation to eyes, throat, and respiratory system.
10. Threshold Limit Value (TLV) - Maximum of eight (8) hour exposure without respiratory equipment is 10 ppm.
11. Corrosive to all electrochemical series metals.
12. Boiling point (-79°F).

## **EXHIBIT 5**

### **CAPROCK FIELD AREA**

### **LIST OF EMERGENCY EQUIPMENT & LOCATION**

#### **LOCATION OF BREATHING EQUIPMENT**

30-minute Self Contained Breathing Apparatus (SCBA) is carried in the following company vehicles:

- Operations Supervisor
- Electrician
- Field Specialist
- Contractor Gang Trucks
- Artificial Lift Representative
- Workover Representative

Additional 30-minute air packs are kept in the warehouse.

#### **LOCATION OF TELEPHONES**

Each company employee and the field office are equipped with cell phones.

#### **PERSONAL MONITORS**

All Celero employees working in the field will carry personal H<sub>2</sub>S monitors. Additional H<sub>2</sub>S monitors are available in the Caprock Field office.

#### **PORTABLE FIRE FIGHTING EQUIPMENT**

Each company vehicle contains a portable fire extinguisher. Additional 10-pound fire extinguishers are available at the Caprock Field office and outbuildings.

## EXHIBIT 6

### CAPROCK FIELD AREA EMERGENCY PHONE NUMBERS

Government agencies notified in the event of an incident at a CAPROCK Facility.

	<u>Daytime Phone &amp; 24 Hr. Phone</u>	
1. <u>Fire</u>		
Roswell Fire Dept. (non-emergency)	575-624-6500	
Emergency	911	
Lovington Fire Dept.	575-396-7318	
Hobbs Fire Dept.	575-397-9308	
2. <u>Oil Spill -Land</u>		
New Mexico Oil Conservation Division (State Land)	505-393-6161	
<u>Oil Spill - Navigable Water</u>		
National Response Center	1-800-424-9300	
4. <u>Flammable Gas Release</u>		
New Mexico Oil Conservation Division	505-393-6161	
CUDD Pressure Control	432-563-3356	
New Mexico State Police	505-392-5588	
5. <u>Hazardous Material Release</u>		
New Mexico Environmental Department	505-393-4302	
New Mexico State Police	505-392-5588	
New Mexico Oil Conservation Division	505-393-6161	
6. <u>Bomb Threat</u>		
Chaves County Sherriff	911	
	575-624-6500	
Lea County Sherriff Dept.	911	
	575-393-2515	
Roswell Police Department	911	
	575-624-6500	
Lovington Police	911	
FBI - Midland	432-570-0255	
FBI - El Paso	432-533-7451	
7. <u>Miscellaneous</u>		
Total Safety U.S. Inc.	575-392-2973	
Roswell Ambulance	575-624-6500	
Roswell Regional Hospital	575-627-7000	
Lea Regional Medical Center	575-492-5000	
8. <u>Celero Company Callout List</u>		
Evan L Wauhob	432-813-5439	Superintendent
Eddie Taylor	575-631-2805	Const. Foreman
Leon Grigry	575-631-1905	Prod. Foreman
Arnie Baeza	575-631-2086	Pumper
Bo Taylor	575-631-1026	Pumper
Rey Guzman	575-631-1496	Pumper

## **EXHIBIT 7**

### **NAMES AND NUMBERS OF OCCUPIED PUBLIC AREAS AND CAPROCK RESIDENCES**

Caudill Ranch House (Jim Owens).....(575) 399-8631

The Caudill Ranch House is occasionally occupied and is located approximately 1300 feet west of RQU well number 99 in Section 34.

Home of Shannon Kizer (Shannon Kizer).....(575) 760-9160

The home of Shannon Kizer is located in Section 18, T14S, R32E---roughly one mile east of the eastern boundary of the Drickey Queen Sand Unit. Although not physically located in the area of operations covered by this plan, access to the home is by travel over Highway 172 and ranch road which are in the area of operations of this plan.

## EXHIBIT 8

### CAPROCK FIELD AREA EMERGENCY ACTION SHEET H2S RELEASE

#### **EMPLOYEE (At Scene):**

1. Notify Supervisor and request emergency assistance.
2. Summarize the nature and severity of the incident. Include any personnel injuries, special equipment needed, or precautions to take when approaching the scene.
3. Request additional assistance. Attempt to rescue any injured personnel and administer first aid only if you are properly trained and if you can do so without compromising your personal safety.

#### **PERSON IN CHARGE (At Scene):**

1. Establish a safe area.
2. Restrict access to affected area.
3. Coordinate the activities at the scene.
4. Request and/or direct additional equipment or assistance as needed.
5. Assess the need for roadblocks, public evacuation, or downwind monitors.

#### **SUPERVISOR (At Office):**

1. Direct phone calls to emergency services (ambulance, fire dept., police, etc.) Provide directions to emergency services.
2. Assign someone to manage incoming calls.
3. Designate a staging area, proceed to the staging area and direct employee assignments.
4. Coordinate Public Evacuation, roadblocks, and equipment movement. Assign personnel to monitor downwind concentrations.
5. Control access to the scene by news media and curiosity seekers.
6. Make required notification to regulatory agencies.
7. As time permits, consult the Emergency Procedures Manual located in the Field Office.

#### **ALL EMPLOYEES (During the Emergency):**

1. If you are near the scene, use your best judgment and assist by rendering aid, spotting for emergency vehicles, etc.
2. Report to the staging area for instructions if you are directed by a supervisor.

# **EXHIBIT 8 CAPROCK FIELD AREA EMERGENCY ACTION SHEET**

## **SPILLS**

Notify the Supervisor who will determine the extent of the hazard from the MSDS.

- If the substance cannot be identified, it must be assumed to be flammable and toxic; use appropriate personal protective equipment
- When possible to do so safely, shut off the flow of the fluid or disconnect the power source to the incident area to eliminate any further discharge. If equipment may act as a source of ignition as is the case with fired vessels or electrical equipment, shut off the power or fuel to prevent a fire or explosion only if it can be done safely and only if it will not provide an ignition source.
- Attempt to identify the material being discharged.
- Proceed with spill containment and cleanup procedures to prevent further damage.

## **FIRES**

Identify the material on fire and consult the MSDS for proper extinguishing agent, special precautions, and required personal protective equipment.

- If possible to do so safely, shut off the fuel feeding the fire.
- If the fire is small, attempt to contain it or put it out with portable fire extinguishers, shovels, or water only if you are properly trained and can do so without compromising your personal safety.
- If unable to control the fire, contact and cooperate with local fire agency. Take direction from local fire agency as necessary.

**EXHIBIT 9**  
**ARIEL PHOTO OF CAPROCK AREA**  
**LEASES AND UNITS**

**A 1" = 1000 foot areal photo of the leases and units operated by Celero Energy that are covered by this plan is attached and is named:**

**Caprock Field Unit Boundaries**  
**Tank Battery Locations**  
**Areal Image---circa 2000**