

30-025-39981



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H2S CONTINGENCY PLAN
DRILLING and COMPLETIONS
OPERATIONS

Blinebry Wells
CP Falby Federal B #6, CP Falby Federal B #7
CP Falby Federal A #9, WT McComack #31
WT McComack #32
Lea County, NM
7/2/10

CONTINGENCY PLAN

INDEX

1. Scope & Objective
2. Location Information / Map
3. Emergency Notification / Evacuation Plan
4. Emergency Procedures and Responsibilities
5. Igniting Well Instructions
6. Training Procedures and Materials
7. Well Location Layout and Equipment

SCOPE & OBJECTIVE

SCOPE

This contingency plan establishes guidelines for the public; all company employees, and contract employees whose work activities may involve exposure to Hydrogen Sulfide gas (H₂S).

OBJECTIVE

1. Prevent any and all accidents, and prevent the uncontrolled release of Hydrogen Sulfide into the atmosphere.
2. Provide proper evacuation procedures.
3. Provide immediate and adequate medical attention should an injury occur.

DIRECTIONS TO LOCATION

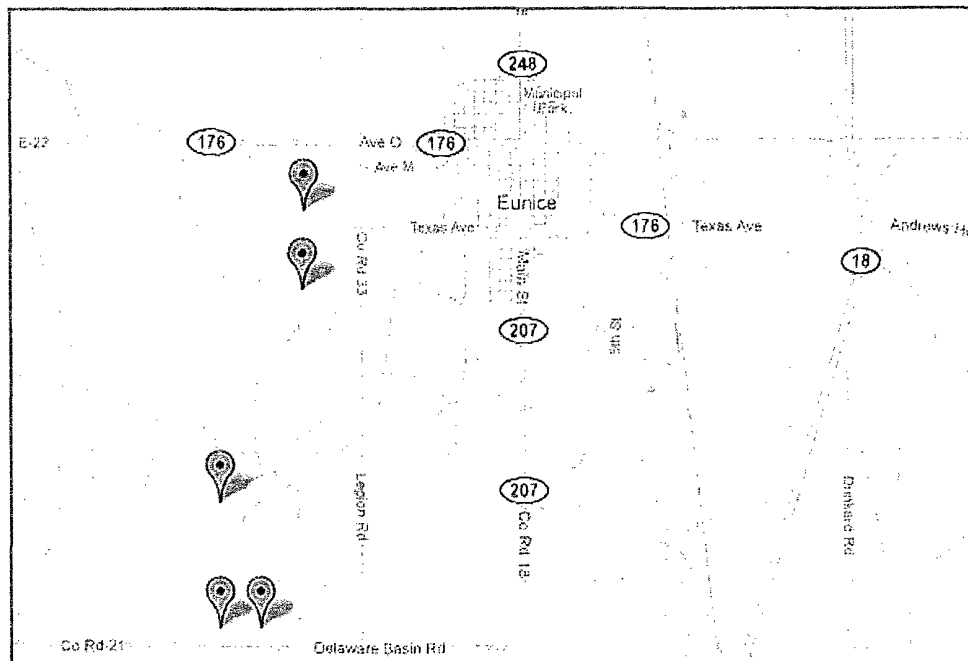
WT McCormack Wells:

From Eunice New Mexico go west on Hwy 176 approximately one mile and look for Rig Sign either to the North or South of Hwy 176.

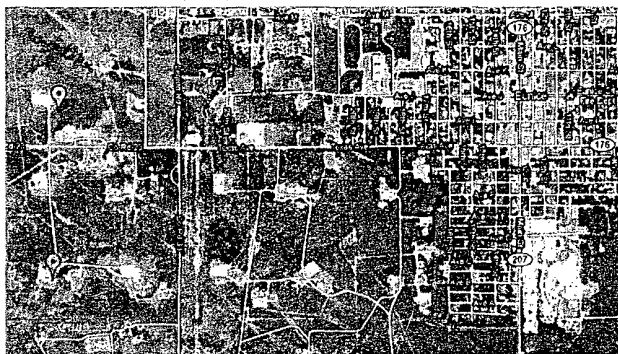
CP Falby Federal Wells:

From Eunice New Mexico, go west on HWY 176 approximately $\frac{3}{4}$ of a mile. Turn left and drive South on County Road 33 approximately 2 miles and look for the rig sign on the right side of the road.

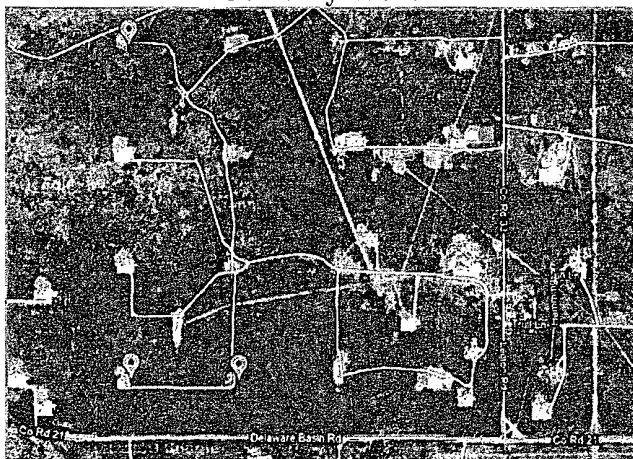
MAP (All well locations)



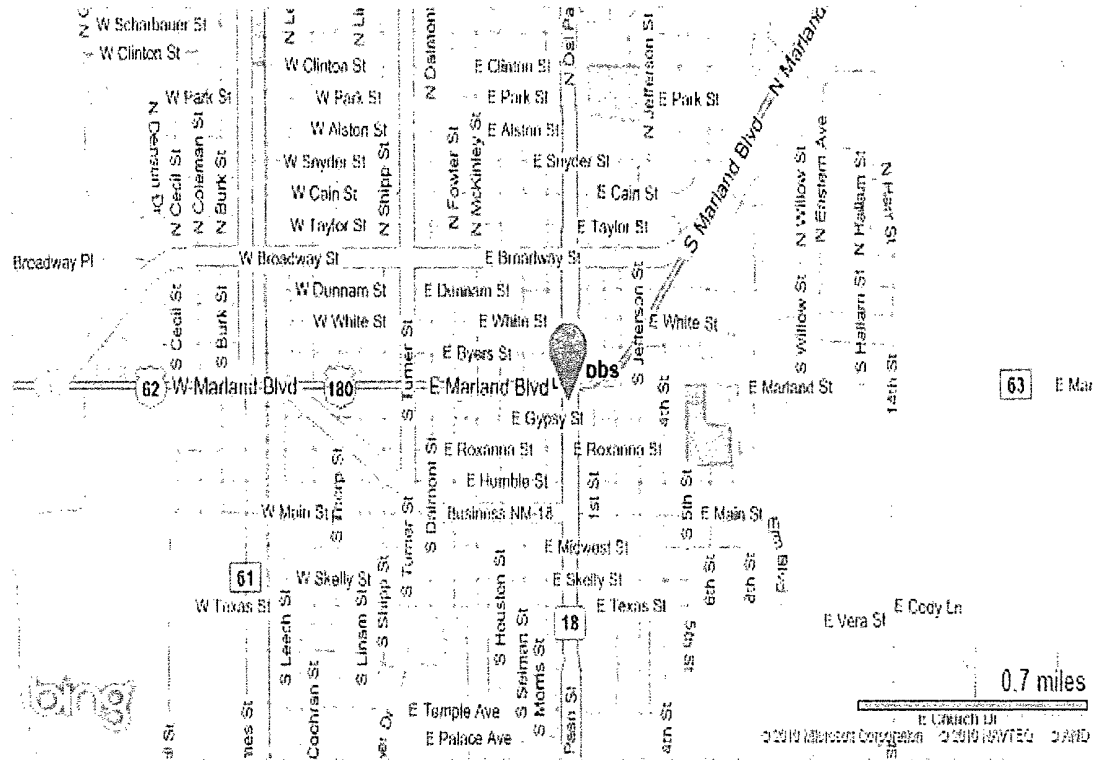
WT McCormack Wells



CP Falby Wells



DIRECTIONS TO HOSPITAL



EMERGENCY PROCEDURES AND RESPONSIBILITIES

It is the Chevron policy in all operations to do everything possible to insure the safety of its employees and the contractor's employees on the job site; additionally, to provide for the safety and comfort of persons near the operations by protecting the environment to the fullest degree possible.

The primary purpose of the procedures outlined herein is to guide the personnel on location in the event that Hydrogen Sulfide (H₂S) reaches the surface.

**TO PROTECT THEIR OWN SAFETY AND THE SAFETY OF OTHERS,
ALL PERSONNEL ON THE JOB SITE WILL RIGIDLY ADHERE TO
THIS PLAN.**

Initial Suspected Problem Zone: Yates at ±2610'

Expected Concentration: ±5000 ppm

ROE @ 100 ppm = 163 feet

ROE @ 500 ppm = 74 feet

The plan should be implemented before drilling into the Yates.

The cementing, casing and mud program are contained in the Chevron Drilling Well Design Program.

EMERGENCY NOTIFICATION / EVACUATION PLAN

EVACUATION PLAN

The following general plan has been developed in the event that any public evacuation becomes necessary.

1. Chevron has requested and has been assured the support of the various public safety entities in the area.
2. Any evacuation will be conducted by the Lea County Sheriff's Department and supported by the State Police Department, Highway Patrol Division.
3. Assistance from other public safety entities may be requested if required.
4. The included maps detail the area of the well site including the inventory or the public within the radius of exposure of the well.
5. In the event that there is any suspected problem on the well, the well site supervisor will notify the Lea County Sheriff's office 575-395-2121 (Hobbs) or 575-394-2020 (Eunice) for ALERT STATUS.
6. ALERT STATUS will require that available public support personnel will proceed to the Lea County Sheriff's office in Hobbs, NM and standby for instructions.
7. If isolation and evacuation are necessary, then units will be dispatched to points marked on the map with instructions to maintain road blocks.
8. Evacuation teams will then proceed to sectors to be evacuated. Evacuation procedure will follow appropriate consideration for wind conditions.
9. Personnel from on site will establish safe perimeters using H2S detectors.
10. New Mexico Oil Conservation Division and other authorities will be notified as soon as possible.
11. Other supplemental contractors will be contacted and called in as needed.

EMERGENCY NOTIFICATION / EVACUATION PLAN

CHEVRON RESOURCES EMERGENCY COMMUNICATION LIST

In the event of communication failure, personnel contacted for well control incidents may be called in order as listed below until satisfactory communication is accomplished. Please give a reasonable amount of time for response before the next contact is called.

Drilling Operations

	Name	Title	Office Number	Home Number	Cell Phone	Pager
1.	Jesus Capo	Engineer	713-372-7590			
2.	Rick Lauchner	Superintendent	713-372-1402		832-439-7583	
4.	Jeff Smith	Drilling Manager	281-561-3545	281-392-8785	281-460-6837	
5.	Jeff Dieffenbaugher	Drilling Manager	832-854-2625		936-827-6980	
6.	Bianca Keneally	D&C HES	713-372-7586		713-417-9428	

Completions Operations

	Name	Title	Office Number	Home Number	Cell Phone	Pager
1.	Jesus Capo	Engineer	713-372-7590			
2.	Boyd Schaneman	Superintendent	432-687-7402	432-520-5877	432-238-3667	
3.	Ivan Pinney	Completions Engineer	432-687-7949		281-796-9252	

4.	Jeff Smith	Drilling Manager	281-561-3545	281-392-8785	281-460-6837	
5.	Jeff Dieffenbaugher	Drilling Manager	832-854-2625		936-827-6980	
6.	Jake Nelson	D&C HES Advisor	432-687-7673	432-638-9390	907-230-8131	

MIDLAND WEO/DRILLING DEPARTMENT

NAME	CAI	CTN Office Phone	Office Location	Office Mailing Address City, State, and Zip	CELLULARNUMBER	POSITION	Home Phone
LOMBARDI, MARK	MLCV	687-7370	Midland	15 Smith Road Midland, TX 79705	432-413-5241	DRILLING SUPERINTENDENT	N/A
SCHANEMAN, BOYD	BDBS	687-7402	Midland	15 Smith Road Midland, TX 79705	432-238-3667	DRILLING SUPERINTENDENT	432-520-5877
BIRKELBACH, LARRY	LGBI	432-687-7106	Midland	15 Smith Road Midland, TX 79705	432-208-4772	REMEDIAL ENGINEER	432-520-7705
DUBLIN, MISTY	MDFT	687-7266	Midland	15 Smith Road Midland, TX 79705		OFFICE ASSISTANT	432-687-2636
HARMON, SHARON	SHDH	687-7290	Midland	15 Smith Road Midland, TX 79705		DRILLING TECH	432-683-3943
JIMINEZ, ANDREA	ARJI	687-7378	Midland	15 Smith Road Midland, TX 79705		TECHNICAL ASSISTANT	432-684-8137
MATTHEWS, RAY	RMHF	687-7224	Midland	15 Smith Road Midland, TX 79705	432-557-0623	DRILLING ENGINEER	432-697-0201
MORRISON, CHERYL	CHLM	281-561-3998	HOUSTON	15 Smith Road Midland, TX 79705	925-389-1798	DRILLING ENGINEER	713-850-0099
PREMENTINE, JIM	PREM	432-687-7348	MIDLAND	15 Smith Road Midland, TX 79705	432-238-2282	WORKOVER REPRESENTATIVE	432-699-1852
RHODES, DAVID	SDRH	432-687-7137	MIDLAND	15 Smith Road Midland, TX 79705	432-557-8311	WORKOVER REPRESENTATIVE	432-230-0895
SMITH, CHERYL	CLSG	687-7315	Midland	15 Smith Road Midland, TX 79705		OFFICE ASSISTANT	432-570-7270
STUMP, ZACH	ZSBD	432-687-7355	Midland	15 Smith Road Midland, TX 79705	432-425-9879	SAFETY SPECIALIST	432-694-6124
WALDROP, JAY	JWBX	432-687-7254	Midland	15 Smith Road Midland, TX 79705	432-556-3547	SAFETY SPECIALIST	432-523-9778

WEATHERFORD, LENEA	LWEA	432-687- 7678	Midland	15 Smith Road Midland, TX 79705		TECHNICAL ASSISTANT	432-694-6548
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GILL, TY	TYGI		MIDLAND	15 SMITH RD.	432-853-3652	DRLG REPRESENTATIVE	
HAUG, JORDAN	JHHV		MIDLAND	15 SMITH RD.	432-894-7908	DRLG REPRESENTATIVE	
HODGES, SHANE	SHBZ		MIDLAND	15 SMITH RD.	281-682-8410	DRLG REPRESENTATIVE	
HOLLAND, BOBBY	BOJH		MIDLAND	15 SMITH RD.	432-557-3364	DRLG REPRESENTATIVE	432-756-3411
LOVELL, JAMES	LMJA		MIDLAND	15 SMITH RD.	432-238-6179	DRLG REPRESENTATIVE	432-699-4340
LITTON, TOM***	TLIT		MIDLAND	15 SMITH RD.	337-288-6038	DRILLING REP	318-755-2282
MC GEE, DANE	GMJT		MIDLAND	15 SMITH RD.	413-409-6228	DRLG REPRESENTATIVE	
MATTHEWS, RORY	PHRM		MIDLAND	15 SMITH RD.	432-631-8487	DRLG REPRESENTATIVE	432-520-8806
MILLER, SCOTT	SNUO		MIDLAND	15 SMITH RD.	432-528-9567	DRLG REPRESENTATIVE	
MILTON, SCOTT	SNQF		MIDLAND	15 SMITH RD.	432-212-3544	DRLG REPRESENTATIVE	
PERRY, JONATHAN	JPMY		MIDLAND	15 SMITH RD.	432-528-2788	DRLG REPRESENTATIVE	
SMITH, KELVIN	KSCE		MIDLAND	15 SMITH RD.	432-631-5583	DRLG REPRESENTATIVE	
UNION, BRIAN	BUNI		MIDLAND	15 SMITH RD.	713-409-6193	DRLG REPRESENTATIVE	
WELBORN, EDDIE	WLBD		MIDLAND	15 SMITH RD.	432-557-3365	DRLG REPRESENTATIVE	432-524-2033

BALDERAZ, JUNIOR	FIVB				432-290-2876	WORKOVER REPRESENTATIVE	432-943-2558
BOHON, DAVID	BOHO	432-558-1910	MCELROY	P. O. Box 937 Crane, TX 79731		WORKOVER REPRESENTATIVE	
CATALLO, DARREN	DCMS					WORKOVER REPRESENTATIVE	
FLOWERS, WALTER	WJFL	432-399-4463 x2222	VEALMOOR	17008 N. FM 1584 Big Spring, TX 79720	325-207-2937	WORKOVER REPRESENTATIVE	325-573-6486
GARCIA, GEORGE	GGRG	575-396-4414	VACUUM	HCR 60, Box 423 Lovington, NM 88260	575-631-9123	WORKOVER REPRESENTATIVE	575-392-2595
HAMMACK, VON	DHJK		VEALMOR		432-894-1713		
HODGES, SHANE	SHBZ	832-854-2600				WORKOVER REPRESENTATIVE	
JENNINGS, DAVID	DRJE		EUNICE	P. O. Box 1949 Eunice, NM 88231	575-441-6186	WORKOVER REPRESENTATIVE	
LORD, MIKE***	MLFZ		NORTH RILEY	P. O. BOX 10 SEMINOLE, TX 79360	432-978-4384 sprint	WORKOVER REPRESENTATIVE	432-758-2479
NELMS, JIMMY***	NEJI	432-758-5271	NORTH RILEY	P. O. BOX 10 SEMINOLE, TX 79360	432-352-6826	WORKOVER REPRESENTATIVE	432-758-3184
NEVES, MICAH	NEVJ	432)550-5510 ext. 29	McElroy	550-5510 ext. 29	+1 (432) 664-7615	WORKOVER REPRESENTATIVE	
NORTHCUTT, MIKE(JOHNNY)***	JNBG	505-396-7503	LOVINGT ON	P. O. BOX 609 Lovington, NM 88260	575-390-4090	WORKOVER REPRESENTATIVE	505-392-8616
PERKINS, ADAM	APDB		McElroy		432-210-8198	WORKOVER REPRESENTATIVE	
RAGLAND, LARRY***	LRAX	432-524-1055	ANDREWS	P. O. BOX 1749 Andrews, TX 79714	432-425-7380	WORKOVER REPRESENTATIVE	432-524-3668

ROLEN, SHANE	DRKP				432-238-8451	WORKOVER REPRESENTATIVE	
QUINTANA, MIKE	MIKQ	432-699- 2107			432-230-8706	WORKOVER REPRESENTATIVE	
SHELTON, JEFF	JTMK		EUNICE		432-413-5246	WORKOVER REPRESENTATIVE	
WARD, BRUCE	BDWA	672-4184			432-967-2843		
BERRINGER, JIM			XACT TECHNOLOG IES		432-238-0581	CONSULTANT	432-267-6783

EMERGENCY NOTIFICATION / EVACUATION PLAN

EMERGENCY CALL LIST

Medical Support

<u>Agency</u>	<u>Location</u>	<u>Telephone Number</u>
AXIOM Medical	Houston	1-877-502-9466
Lea Regional Medical Center	Hobbs	575-492-5258

EMERGENCY NOTIFICATION / EVACUATION PLAN

EMERGENCY CALL LIST

Public Support

<u>Agency</u>	<u>Location</u>	<u>Telephone Number</u>
Lea Regional Medical Center	Hobbs	575-492-5258
Ambulance	Eunice	575-394-2020
Fire Department	Eunice	575-394-2020

EMERGENCY NOTIFICATION / EVACUATION PLAN

EMERGENCY CALL LIST

Supplemental Equipment

MUD COMPANY

Buckeye	432-682-7422	Midland
Halliburton/Baroid	432-682-4305	Midland

SAFETY COMPANY

Safety International	432-580-3770	Odessa
DXP Safety	800-530-8693	Hobbs

CEMENTING COMPANY

Schlumberger	575-393-6186	Hobbs
BJ Services	575-392-6711	Hobbs
Halliburton	575-392-7062	Hobbs

PUMP TRUCKS / WATER HAULERS

Basic Energy	575-392-6498	Hobbs
Pool	575-392-2577	Hobbs
Key	575-393-9171	Hobbs

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EMERGENCY NOTIFICATION / EVACUATION PLAN

EMERGENCY CONDITIONS

Operating Conditions

A. Emergency Procedures and Definition of Warning Flags.

1. Condition: YELLOW ---- NORMAL OPERATION
2. Condition: ORANAGE -- POTENTIAL DANGER--- CAUTION

a. Cause for condition:

- Circulating up drilling breaks
- Trip gas after trip
- Circulating out gas on choke
- Poisonous gas present, but below threshold concentrations

b. Safety actions:

- Check safety equipment and keep it with you
- Be alert for a change in conditions
- Follow instructions

3. Conditions RED ----- EXTREME DANGER

a. Cause for conditions

- Uncontrolled flow from the well with lethal concentrations of H₂S

b. Safety Actions

- Masks On. All personnel will have protective breathing equipment with them. All personnel will stay in safe briefing area unless instructed to do otherwise.
- The decision to ignite the well is the responsibility of the company representative and should be made only as a last resort, when it is clear that:
 - i Human life is endangered
 - ii There is no hope of controlling the well under prevailing conditions.
- Order evacuation of local people within the danger zone.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

DRILLING CREW ACTIONS

1. All personnel will don their protective breathing apparatus. The drilling crew will take necessary precaution as indicated in OPERATING PROCEDURES.
2. The Buddy System will be implemented. All personnel will act upon direction from the Operator's Representative.
3. If there are nonessential personnel on location, they will move off location.
4. Entrance to the location will be patrolled, and the proper condition flag will be displayed at the entrance to the location.

IN THE EVENT OF AN ACCIDENTAL RELEASE OF PTENTIALLY HAZARDOUSS VOLUME OF H2S, THE FOLLOWING PROCEDURES WILL BE TAKEN.

1. All personnel on location will be accounted for and emergency search should begin for any missing.
2. All search missions will be conducted under fresh air masks in teams of two. Should the search team need to approach the well, safety harness and rope should be used.
3. All individual companies and agencies should be contacted according to the EMERGENCY CALL LIST.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. The Operator's Representative will remain on location and attempt to regain control of the well.
6. The Company's designated representatives will begin evacuation of those persons in immediate danger.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

NOTE

When Hydrogen Sulfide might be encountered, NO personnel on location will be permitted to sleep in vehicles.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

RESPONSIBILITY

In the event of a release of potentially hazardous amounts of H₂S, all personnel will immediately proceed upwind to the nearest designated safe area and don their protective breathing equipment. The Chevron representative will immediately, upon assessing the situation, set this plan into action by taking the proper procedures to contain the gas and notify the appropriate people and agencies.

If the Chevron representative is incapacitated or not on location, this responsibility will fall to the drilling toolpusher.

Chevron

1. In an emergency situation, the Drilling Representative on duty will have complete responsibility and will take whatever action is deemed necessary in an emergency situation to insure the personnel's safety, to protect the well and to prevent property damage.
2. Advise the Drilling Superintendent when procedures as specified herein have been met, will inform of emergencies and deviation from the plan, and see that procedures are observed at all times.
3. Advise each contractor, Service Company, and all others entering the site that Hydrogen Sulfide may be encountered and the potential hazards that may exist.
4. Authorize the evacuation of local residents if Hydrogen Sulfide threatens their safety.
5. Keep the number of persons on location to minimum during hazardous operations.
6. Assess the situation when alarm sounds, and issue work orders. When conditions warrant, order all personnel to "Safe Briefing Areas".
7. Direct corrective actions to control flow of gas.
8. Has full responsibility for the decision to ignite the well. The decision will be made only as a last resort.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

DRILLING COMPANY

1. The Toolpusher will assume all responsibilities of the Drilling Representative in an emergency situation in the event that the Drilling Representative becomes incapacitated.
2. The Toolpusher will order the Driller to secure the rig if time permits.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

EQUIPMENT TO BE PROVIDED BY SAFETY COMPANY

1. One safety trailer containing an 8 bottle air cascade system
2. 750 feet of air line hose
3. Four breathing air manifolds
4. Four 30 minute rescue units
5. Five work/escape units
6. One filler hose for the work/escape and rescue units
7. One location sign with flags
8. Two briefing area signs
9. Two windsocks
10. One electronic monitor with three sensor heads, warning light and siren.

EMERGENCY PROCEDURES AND RESPONSIBILITIES

TEMPORARY SERVICE PERSONNEL

All service personnel, such as cementing crews, logging crews, specialists, mechanics and welders will furnish their own safety equipment as required to comply with OSHA and Chevron.

VISITORS

Visitors and nonessential personnel will be prohibited from remaining in, or entering a contaminated area where Hydrogen Sulfide concentration in the atmosphere exceeds 15 ppm.

IGNITING WELL INSTRUCTIONS

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF THE CHEVRON REPRESENTATIVE. In the event he is incapacitated or unavailable, it becomes the responsibility of the drilling rig superintendent.

The decision to ignite the well should be made only as a last resort and in the situation where it is clear that:

1. Human life is in danger
2. There is no hope of controlling the well under current conditions.

The Chevron Drilling Superintendent should be notified as soon as possible. The first phase of evacuation should be initiated immediately.

Once the decision has been made the following procedures should be followed:

1. Four people, wearing self-contained breathing apparatus will be needed for the actual lighting of the well. They must first establish the flammable parameter by using an explosion meter. This should be established at 30% to 40% of the lower flammable limits.
2. After the flammable perimeter has been established and everyone removed from the area, the ignition team should select a site upwind of the well, from which to ignite. The site should offer the maximum protection and have a clear path for retreat from the area.
3. The ignition team should have safety belts and lanyards attached and manned before attempting ignition. If the leak is not ignited on the first attempt, move in 20 to 30 feet and fire again. Continue to monitor with the explosion meter and never fire from an area with over 75% of the lower explosive limit (LEL). If having trouble igniting the well, try firing 40 degrees to 90 degrees on either side of the well.
4. After ignition or attempted ignition, the toxic perimeter must be established and evacuation continued until the well is contained.
5. All personnel will act only as directed by the person in charge of the operations.

TRAINING PROCEDURES AND MATERIALS

SAFETY TRAINING

1. Hydrogen Sulfide Safety Training will be provided to all personnel at 1,000 feet above the expected H₂S formation. The training sessions will cover, but will not be limited to the following.
 - a. General information on H₂S and SO₂ gas
 - b. Hazards of H₂S and SO₂ gas
 - c. Safety equipment on location
 - d. Proper use and care of personal protective equipment
 - e. Operational procedures in dealing with H₂S gas
 - f. Evacuation procedures
 - g. Chemicals to be used in mud to control H₂S
 - h. First aid, reviving and H₂S victim, toxicity, etc.
 - i. Designated Safe Briefing Areas (S.B.A.)
 - j. Metallurgical considerations

NOTE: Once H₂S Safety Procedures are established on location, no beards or facial hair which will interfere with face seal or mask will be allowed on location

2. When H₂S alarm is activated:
 - a. Mask up
 - b. Raise tool joints above the rotary table and shut down pump
 - c. Close in hydrill
 - d. Go to Safe Briefing Area

TRAINING PROCEDURES AND MATERIALS

PHYSICAL EFFECTS OF HYDROGEN SULFIDE POISONING

The Principal Hazard Is Death by Inhalation

When the amount of gas absorbed into the bloodstream exceeds that which is readily oxidized, systemic poisoning results, with a general action on the nervous system. Labored respiration occurs shortly and respiratory paralysis may follow immediately at concentrations of 700 ppm and above. This condition may be reached almost without warning as the originally detected odor of H₂S may have disappeared due to olfactory paralysis. Death then occurs from asphyxiation unless the exposed person is removed immediately to fresh air and breathing is stimulated by artificial respiration. Other levels of exposure may cause the following symptoms individually or in combination:

1. Headache
2. Dizziness
3. Excitement
4. Nausea or gastro-intestinal disturbances
5. Dryness and sensation of pain in nose, throat, and chest
6. Coughing
7. Drowsiness

All personnel should be alerted to the fact that detection of H₂S solely by sense of smell is highly dangerous, as the sense of smell is rapidly paralyzed by the gas. 10 ppm of H₂S detected should be treated as if it were 700 ppm.

TRAINING PROCEDURES AND MATERIALS

REMEMBER:

After the well is ignited, burning Hydrogen Sulfide (H_2S) will convert to Sulfur Dioxide (SO_2), which is also a highly toxic gas.

DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.

TRAINING PROCEDURES AND MATERIALS

THE USE OF SELF CONTAINED BREATHING EQUIPMENT

1. Respirators shall be inspected frequently at random, to insure that they are properly used, cleaned and maintained.
2. Anyone who may use the respirators shall be trained in how to insure proper face piece to face seal. They shall wear respirators in normal air and then wear it in a test atmosphere. (Note: such items as facial hair – beard or sideburns – and eyeglass temple pieces will not allow a proper seal.) Anyone who may be reasonably expected to wear respirators should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eye glasses. Contact lenses should not be allowed.
3. Maintenance and care of respirators:
 - a. A program for maintenance and care of respirators shall include the following:
 - Inspection for defects, including leaks checks
 - Cleaning and disinfecting
 - Repair
 - Storage
 - b. Inspection: Self contained breathing apparatus for emergency use shall be inspected monthly for the following and a permanent record kept of these inspections.
 - Fully charged cylinders
 - Regulator and warning device operations
 - Condition of face piece and connections
 - Elastic or rubber parts shall be stretched or massaged to keep them pliable and prevent deterioration.
 - c. Routinely used respirators shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
4. A person assigned a task that requires use of self contained breathing equipment should be certified, physically fit for breathing equipment usage by the local physician at least annually.
5. Respirators should be worn:
 - a. When breaking out any line where H₂S can reasonably be expected.
 - b. When sampling air in areas to determine if toxic concentrations of H₂S exist.
 - c. When working in areas where over 15 ppm H₂S has been detected.
 - d. At any time there is a doubt as to the H₂S concentration in the zone to be entered.

TRAINING PROCEDURES AND MATERIALS

TRAINING

Every person working in any capacity on the lease will be required to review the emergency procedures and will participate in the training program.

CHEVRON will provide personnel to direct the training program and indoctrinate all authorized persons on the lease in the proper use of the safety equipment.

The training personnel will work individually with each member until they are satisfied that the crew member is familiar with the emergency procedures and the training program. This should be accomplished prior to an individual's work operation.

Training will include hands on use of all equipment in order to familiarize the trainees with the safety equipment.

TRAINING PROCEDURES AND MATERIALS

TREATMENT OF HYDROGEN SULFIDE POISONING

Inhalation

As Hydrogen Sulfide in the blood oxidizes rapidly, symptoms of acute poisoning pass off when inhalation of the gas ceases. It is important, therefore, to get the victim of poisoning to fresh air as quickly as possible. He should be kept at rest and chilling should be prevented. If respiration is slow, labored or impaired, artificial respiration may be necessary.

Most persons overcome by Hydrogen Sulfide may be revived if artificial respiration is applied before heart action ceases. Victims of poisoning should be under the care of a physician as soon as possible. Irritation due to sub acute poisoning may lead to serious complications such as pneumonia. Under those conditions, treatment by the physician necessarily would be symptomatic. The patient should be kept in fresh air.

Contact with Eyes

Eye contact with liquid and / or gas containing Hydrogen Sulfide will cause painful irritation (conjunctivitis). Keep patient in a darkened room, apply ice compresses to eyes, put ice on forehead, and send for a physician. The irritation caused by exposure to Hydrogen Sulfide requires treatment by a physician, preferably an eye specialist. The prognosis for recovery in these cases is usually good.

Contact with Skin

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

TRAINING PROCEDURES AND MATERIALS

EFFECTS OF HYDROGEN SULFIDE ON METAL

Hydrogen Sulfide dissolves in water to form a weak acid that can cause some pitting, particularly in the presence of oxygen and/or carbon dioxide. However, the most significant action of H₂S is its contribution to a form of Hydrogen embrittlement known as Sulfide Stress Cracking. Sulfide Stress Cracking is a result of metals being subjected to high stress levels in a corrosive environment where H₂S is present. The metal will often fail in a brittle manner. Sulfide Stress Cracking of steel is dependent upon and determined by:

1. Strength (hardness) of the steel – the higher the strength, the greater the susceptibility to sulfide stress cracking. Steels having yield strengths up to 95,000 psi and hardness up to Rc22 are generally resistant to sulfide stress cracking. These limitations can be extended slightly higher for properly quenched and tempered materials.
2. Total member stress (load) – higher the stress level (load) the greater the susceptibility to sulfide stress cracking.
3. Corrosive environment – corrosive reactions, acids, bacterial action, thermal degradation of low Ph fluid environment.

TRAINING PROCEDURES AND MATERIALS

DRILLSITE LOCATION

1. The drilling rig should be situated on location such that the prevailing winds blow across the rig toward the reserve pit or at right angles to a line from the rig to the reserve pit.
2. The entrance to the location should be designed so that it can be barricaded if Hydrogen Sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available in case of a catastrophe; a shift in the wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.
3. Once H₂S safety procedures are established on location, no beards or facial hair which will interfere with face seal or mask will be allowed on location.
4. A minimum of two Briefing Areas will be established, not less than 250 feet from the wellhead and in such location that at least one area will be up-wind from the well at all times. Upon recognition of an emergency situation, all personnel should assemble at the designated briefing areas for instructions.
5. A safety equipment trailer will be stationed at one of the briefing areas.
6. Windsocks will be installed and wind streamers (6 to 8 feet above ground level) placed at the location entrance. Windsocks shall be illuminated for night time operations. Personnel should develop wind direction consciousness.
7. The mud logging trailer will be located so as to minimize the danger from gas that breaks out of the drilling fluid.
8. Shale shaker mud tanks will be located so as to minimize the danger from gas that breaks out of the drilling fluid.
9. Electric power plants will be located as far from the well bore as practical so that it may be used under condition where it otherwise would have to be shut down.
10. When approaching depth where Hydrogen Sulfide may be encountered, appropriate warning signs will be posted on all access roads to the location and at the floor of all stairways to the derrick floor.
11. Appropriate smoking areas will be designated and smoking will be prohibited elsewhere.

WELL LOCATION LAYOUT AND EQUIPMENT

SPECIAL EQUIPMENT

1. Flare lines should be as long as practical, securely staked in accordance with the Safe Work Practices Manual.
2. An electronic Hydrogen Sulfide monitor will be installed with a combination visual and audible alarm system located where it can be seen and/or heard throughout the drilling area.
3. The electronic Hydrogen Sulfide monitoring system will be calibrated to activate the low alarm (visual alarm) at a concentration of 10 ppm Hydrogen Sulfide in the atmosphere and the high alarm at a concentration of 15 ppm Hydrogen Sulfide in the atmosphere.
4. Extra equipment will be available if required to provide adequate respiratory protection for all personnel on location.

WELL LOCATION LAYOUT AND EQUIPMENT

BLOWOUT PREVENTION EQUIPMENT

1. A kill line of ample strength and length will be laid to safe point to allow pumping into the well in an emergency situation.
2. The closing unit should be located a safe distance from the well bore and positioned for maximum utilization based on the prevailing wind direction.
3. BOP equipment will be tested in accordance with standard company practice. (Safe Work Practices Book Section 13.9)

WELL LOCATION LAYOUT AND EQUIPMENT

DRILL STEM TEST

1. A drill stem tests of Hydrogen Sulfide zones will be approved by the NMOCD.
2. Drill stem testing of Hydrogen Sulfide zones will be permitted only during daylight hours.
3. All nonessential personnel will be moved to "Safe Briefing Areas".
4. Put on air masks before formation fluids are expected at the surface and continue "Masks On" until flare is ignited and work areas test no more than 10 ppm Hydrogen Sulfide and the area has been declared safe.

BLINEBRY WELLS

