

ARENA RESOURCES, INC.
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HYDROGEN SULFIDE (H₂S) CONTINGENCY PLAN

EAST HOBBS SAN ANDRES UNIT
Sections 29-32, T18S, R39E
Lea County, New Mexico



Submitted To:

New Mexico Oil Conservation Division
District 1
1625 North French Dr.
Hobbs, NM 88240

**H2S CONTINGENCY PLAN
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**H2S CONTINGENCY PLAN
ARENA RESOURCES, INC.
EAST HOBBS SAN ANDRES UNIT**

PURPOSE

This plan is intended to protect the health and safety of the public, contractors and Arena Resources, Inc. (Arena) personnel should an unanticipated release of a potentially hazardous volume of Hydrogen Sulfide (H₂S) occur.

Further to:

- Comply with the Bureau of Land Management's (BLM) Onshore Oil and Gas Operations Onshore Oil and gas Order No. 6, Hydrogen Sulfide Operations (43 CFR Part 3160).
- Comply with the State of New Mexico Oil Conservation Division's (NMOCD) Rule 19 NMC 15.C 118.
- Assure proper notification of the appropriate parties and agencies

SCOPE

The provisions of this document are intended to address Hydrogen Sulfide (H₂S) releases and H₂S emergencies at Arena Resources, Inc. production batteries, wells and all surrounding operated field locations in the East Hobbs San Andres Unit. Facilities for which calculations indicate a potential hazardous volume of H₂S could occur have additional site specific response information and radius of exposure drawn on the attached USGS topographic map. The production field is located immediately SE of Hobbs, NM (Lea County).

DEFINITIONS

All Clear – Notification of effected personnel, by the response leader, that an incident has ended and the area is safe to re-enter.

A Potentially Hazardous Volume – a volume of Hydrogen Sulfide (H₂S) gas of such concentrate that:

- The 100-ppm radius of exposure (ROE) includes any public area.
- The 500-ppm radius of exposure (ROE) includes any public road.
- The 100-ppm radius of exposure (ROE) exceeds 3,000 feet.

Facility – Equipment involved in producing, processing, or transporting natural gas and/or crude oil, including the property to the edge of the pad or fence.

Hydrogen Sulfide Gas (H₂S) – an extremely flammable, colorless, poisonous gas that may occur naturally as a component of production streams, such as crude oil, produced water and natural gas. At low concentrations it has a rotten egg odor, but at higher concentrations deadens the sense of smell. Its specific gravity is heavier than air giving it a tendency to collect in low-lying areas on still days. The permissible exposure limit is 10 ppm and the short term exposure limit is 15 ppm. It is considered to be immediately dangerous to life and health at 300 ppm. H₂S is readily dispersed in air and is water soluble.

ICS (Incident Command System) – A team based concept for emergency response in which roles and responsibilities are predetermined.

Incident Commander (IC) – Senior Arena Resources, Inc. employee in charge of an emergency response.

Incipient Stage Fire – A fire in the beginning or very early stages of development, which can be effectively extinguished by one or more persons with portable fire fighting equipment.

Muster Site – A pre-defined staging or meeting area.

RMS Level I – An emergency that can be reasonably addressed by the Hobbs Area Office in which the incident occurs and that can be resolved in approximately two days or less.

ROE (Radius of Exposure) – The radius constructed with the point of escape (of gas) as its starting point and its length calculated using the Pasquill-Gifford derived equation or computer modeling where the H₂S concentration is greater than 10%.

PPM – Parts per Million

Public Area – Any building or structure that is not associated with the well, facility or operation for which the ROE is being calculated and that is used as a dwelling, office, place of business, church, school, hospital or government building, or any 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.

Public Road – Any federal, state, municipal or county road or highway.

Serious Incident – An event which results or has the potential to result in severe personal injury and/or significant equipment damage.

Sulfur Dioxide (SO₂) – A heavy colorless toxic gas that is formed when hydrogen sulfide is burned. It has a pungent odor and is a respiratory irritant. The permissible exposure limit is 2 ppm, the short term exposure limit is 5 ppm. It is considered to be immediately dangerous to life and health at 100 ppm. SO₂ is readily dispersed in air and is water soluble.

Total Personnel Evacuation – An evacuation of all persons (contract employees, or visitors) from the emergency area to a muster area.

THE PLAN

Training:

All personnel (company, contractors and sub-contractors) working in the field for Arena Resources, Inc. are required to complete hydrogen sulfide training before beginning work and annually thereafter.

Training on the contents of this plan shall be provided to all Arena Resources, Inc. and appropriate contract personnel working for Arena Resources, Inc.:

- whenever the employees' responsibilities or designated actions under the plan change,
- whenever the contents of the plan are changed/revised,
- whenever a new employee begins employment, and
- Periodically as needed for all employees.

Arena Resources, Inc. supervision is responsible for this training.

Orientation:

All persons visiting or working at the East Hobbs San Andres Unit shall receive an orientation covering the following minimum items:

- What types of emergencies are possible,
- How to report an incident/emergency,
- Who will be in charge during an emergency,
- How to safely evacuate the area, and
- Where to assemble so that all persons can be accounted for.

The Arena representative responsible for the contractors or visitors shall conduct the orientations and shall document attendees and dates.

H2S Monitors:

All personnel working at the East Hobbs San Andres Unit are required to wear a personal H2S monitor at all times when working in the area. Monitors should have a vibrating alarm if used in high noise areas.

Activation:

Phase I – activated when:

1. Sustained H₂S concentration reaches 10 parts per million (ppm) in any work area and the source is not readily identified and/or controllable.
2. Continuous H₂S levels are detected at 10 ppm (or greater) at any public road, near an occupied residence or bus stop, and the source is not readily identified and/or immediately controlled.

Phase II – activated when:

1. A potentially hazardous volume of H₂S is detected.
2. When sustained H₂S concentrations exceed 50 ppm at any facility boundary.

Phase I:

Upon discover onsite personnel should:

- Make others on-site aware of the presence of H₂S and leave the area upwind or crosswind to a safe location. (Pre-determine if a pre-job tailgate meeting was conducted).
- Prevent unauthorized persons from entering the area. Request assistance if needed.
- If a residence or other public area is in the vicinity, monitor for H₂S to ensure exposure is less than 10 ppm. Notify supervisor if higher exposures are noted or if any other questions arise about steps necessary to protect these sensitive areas.
- If considering re-entering the area to assess the H₂S source, ensure you have been properly trained to respond. Use an H₂S monitor with digital display (preferably a multi-gas monitor) and have a supplied air respirator (SAR) and back up person with (SAR) readily available. Consider notification of supervisor if appropriate.
- Proceed with caution. If H₂S concentration reaches 10 ppm in your breathing zone, back out and use SAR to re-enter. **If H₂S concentration reaches 50 ppm at the facility boundary, immediately notify supervision.**

- If source can be safely controlled, monitor area to ensure H2S levels are below 10 ppm. End response here and sound all clear to allow others to re-enter the area. Report length of release and volume to supervisor.
- If the source of H2S cannot be identified and/or controlled, or if you cannot do so without exposing yourself to danger, leave the area to a safe distance.
- Notify supervision.
- Continue to monitor for H2S and maintain site security until instructed by supervision to do otherwise.

Supervision:

- Gather necessary information to determine the course of action and level of response.
- Mobilize any additional manpower or equipment necessary.
- Ensure Phase II measures are implemented if appropriate.
- Continue to monitor situation until incident is over.
- Make notifications if required.
- Complete reports if required.
- Investigate as indicated.

Phase II

Upon discovery on-site personnel should:

- Make others on-site aware of the presence of H₂S and leave the area upwind or crosswind to a safe location. (Pre-determined if a pre-job tailgate meeting was conducted.
- Prevent authorized persons from entering the area.
- **Notify Supervisor**

Supervision:

- Mobilize the resources necessary to maintain site security and provide for the protection of personnel and the public
- Issue warnings to all Arena personnel by radio and/or phone to make them aware of the incident and its location. Have non-essential personnel leave the area. If deemed necessary, order a total personnel evacuation of the area.
- Notify non-company personnel known to work or reside in the area. If necessary to ensure their safety, dispatch Arena personnel with the appropriate monitor, supplied air respirators and means of communication to these locations.
- Have Arena personnel set up road blocks to prevent unauthorized entry into impacted areas until relieved by law enforcement or other authorized personnel.
- Make appropriate notifications to NPC, Federal, State and local authorities.
- When the release has been contained and monitoring indicates the area is safe to re-enter, terminate operations and signal the all clear.
- Complete records if required.
- Investigate as indicated.

All other personnel not involved in the immediate response:

- If a total evacuation is ordered, report to the incident command center or nearest muster site to which you have safe access.
- Ensure all contract personnel working for you (or in your area) are accounted for and have them report to a safe muster site.
- Senior employee at each muster site should make a roster of all personnel reporting to that muster site and be prepared to make it available to the incident commander (IC).
- Maintain communication with the IC and be prepared to offer assistance as it is requested.

Ignition of H₂S:

While no uncontrollable release of H₂S is anticipated, should ignition of gas be necessary for the protection of personnel or the public, the determination would be made by the Arena Supervisor on location. The method of ignition will maintain the safety of the person performing this task as the primary concern. The most likely method would be the use of a flare gun from a safe distance.

If this becomes necessary, monitoring will include Sulfur Dioxide (SO₂) in addition to H₂S.

Coordination with State Emergency Plans:

Under certain conditions as provided for in the New Mexico Hazardous Materials Emergency Response Plan (HMER), the New Mexico State Police responding to the emergency may elect to assume the position of Field Incident Commander (FIC) or they may establish a Unified Command of which the Arena Field Incident Commander may be a key member. Under the Unified Command scenario, the Arena FIC shall cooperate with the other involved emergency responders, such as the New Mexico State Police, local fire department, City Police, Sheriff's Office, NMOCD or other appropriate public emergency response agencies to manage the effective and safe response to the emergency situation.

**ARENA RESOURCES, INC.
EMERGENCY CONTACTS**

Contact	Office	Mobile	Pager	Home
Danny Palmer	(505) 393-2958	(505)631-4113	N/A	N/A
Phil Terry	(918) 747-6060	(918) 520-2426	N/A	N/A
Charles Walker	N/A	(806) 592-1272	N/A	(806) 592-2721

**EMERGENCY SERVICES
OUTSIDE SUPPORT PHONE NUMBERS**

Hospital Name	Address	City	Phone Number
Lea Regional Hospital	5419 Lovington Highway	Hobbs, NM	(505) 492-5000
Covenant health Care Center (Dr. Hood)	2410 N. Fowler	Hobbs, NM	(505) 392-5571
Memorial Hospital	209 NW 8 th	Seminole, TX	(432) 758-5811
Nor-Lea General Hospital	1600 N. Main Street	Lovington, NM	(505) 396-6611
Yoakum County Hospital	412 Mustang Dr.	Denver City, TX	(806) 592-5484
Brownfield Regional Medical Center	705 E. Felt	Brownfield, TX	(806) 637-3551
Covenant Health Systems	4000 24 th Street	Lubbock, TX	(806) 725-6000
Covenant Medical Center	2615 19 th Street	Lubbock, TX	(806) 725-1011
University Medical Center	602 Indiana	Lubbock, TX	(806) 743-3111

AMBULANCE	Phone Number
Hobbs, NM	911 or (505) 397-9308
Lovington, NM	911 or (505) 396-2811
Eunice, NM	911
Seminole, TX	(432) 758-9871
Denver City, TX	911 or (806) 592-3516

AIR AMBULANCE	Phone Number
AEROCARE Methodist Hospital, Lubbock, TX	1-800-627-2376

POLICE

CITY	PHONE NUMBER
Hobbs, New Mexico	911 or (505) 397-9265
Eunice, New Mexico	911 or (505) 394-2112
Lovington, New Mexico	911 or (505) 396-2811

SHERIFF

CITY/COUNTY	PHONE NUMBER
Lea County Sheriff – Hobbs	(505) 393-2515
Lea County Sheriff – Lovington	(505) 396-3611

STATE HIGHWAY PATROL

CITY	PHONE NUMBER
Hobbs, New Mexico	(505) 392-5588

FIRE DEPARTMENT

CITY	PHONE NUMBER
Hobbs, New Mexico	911 or (505) 397-9308
Lovington, New Mexico	911
Denver City, Texas	911 or (806) 592-3516
Seminole, Texas	911 or (432) 758-9871

AIRPORTS

CITY	PHONE NUMBER
Lea County Airport – Carlsbad Hwy	(505) 393-4943
Lea County Lovington Airport	(505) 396-9911
Lubbock International Airport	(806) 762-6411
Midland International Airport	(432) 563-2033

GOVERNMENT AGENCIES

AGENCY	PHONE NUMBER
NMOCD – Hobbs	(505) 370-7106
NMOCD – Santa Fe	(505) 827-7131
NMED - Air Quality Bureau	(505) 827-1494
NMED – OSHA	(505) 827-2850
Bureau of Land Management	(505) 393-3612
Local Emergency Planning Commission – David Hooten	(505) 397-9231

POISON CONTROL CENTER	(800) 432-6866
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APPROVALS

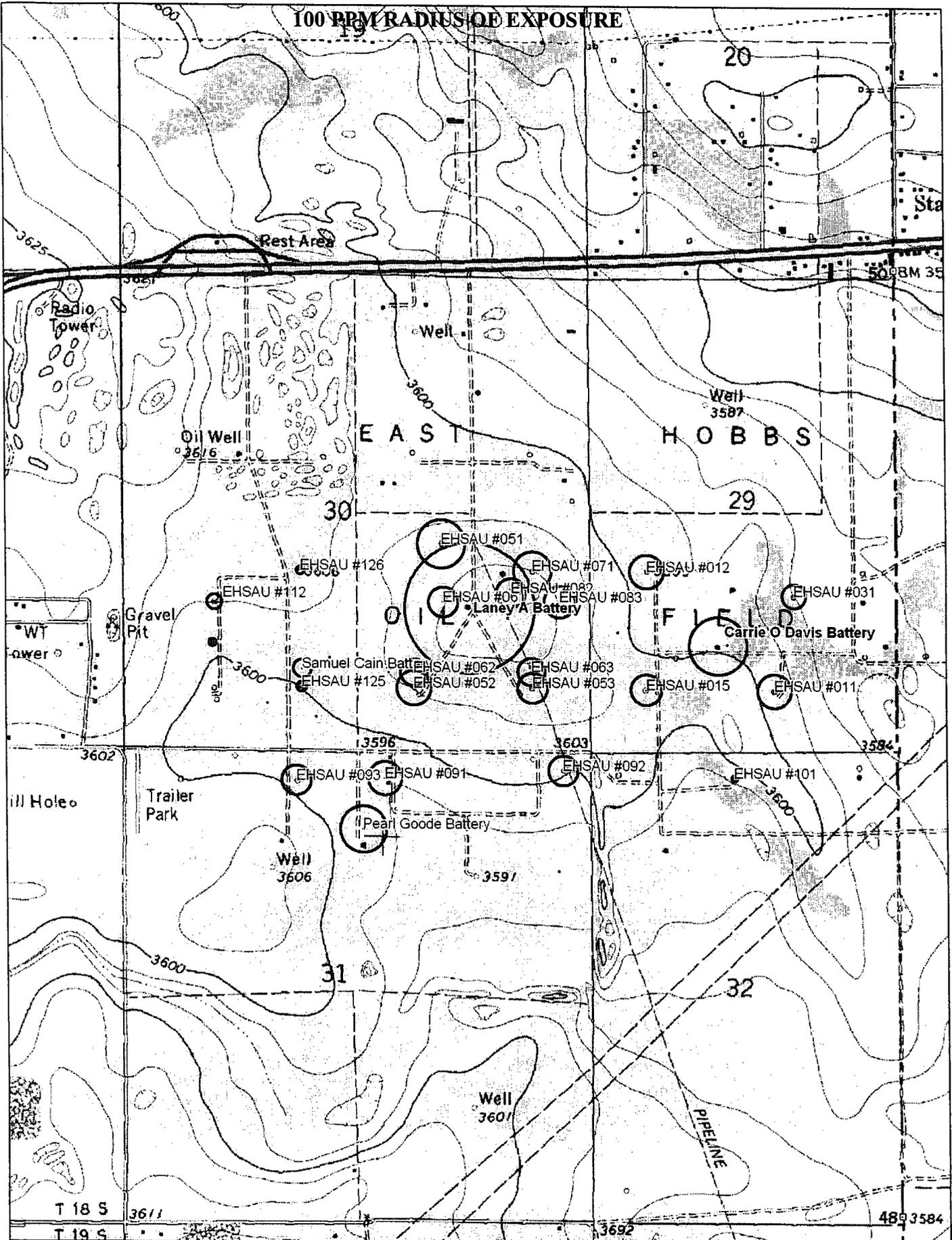
Approved by: Name: Darryl M. Palmer Date: 12-29-04

Title: Production Foreman

**ARENA RESOURCES, INC.
HYDROGEN SULFIDE RADIUS OF EXPOSURE
EAST HOBBS SAN ANDRES UNIT**

NMOCD Well Name	Field Well Name	500 ppm ROE (ft)	100 ppm ROE (ft)
EHSAU #011	Carrie O Davis No. 1	87	191
EHSAU #012	Carrie O Davis No. 2	87	190
EHSAU #015	Carrie O Davis No. 5	79	173
EHSAU #021	Ferguson No. 21		
EHSAU #031	Ralph Davis San Andres No. 1	61	134
EHSAU #051	Laney No. 1	124	271
EHSAU #052	Laney No. 2	89	196
EHSAU #053	Laney No. 3	78	170
EHSAU #061	Laney A No. 1	77	168
EHSAU #062	Laney A No. 2	70	152
EHSAU #063	Laney A No. 3	71	155
EHSAU #071	Laney Reese No. 1	99	216
EHSAU #082	Laney Reese No. 2	74	163
EHSAU #083	Laney Reese No. 3	81	177
EHSAU #091	Pearl Goode No. 1	86	188
EHSAU #092	Pearl Goode No. 2	76	167
EHSAU #093	Pearl Goode No. 3	76	165
EHSAU #101	Ralph Lowe State No. 1	14	31
EHSAU #102	Ralph Lowe State No. 2	20	43
EHSAU #111	Rocket Cain No. 1		
EHSAU #112	Rocket Cain No. 2	39	85
EHSAU #125	Samuel Cain No. 5	25	55
EHSAU #126	Samuel Cain No. 6	20	44
	Carrie O Davis Battery	149	326
	Laney Battery	337	737
	Pearl Goode Battery	118	258
	Samuel Cain Battery	46	101
	Rocket Cain Separator	18	40

100 RPM RADIUS OF EXPOSURE



T 18 S

T 19 S

3611

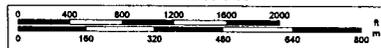
Scale 1 : 17,600

1" = 1470 ft

TN

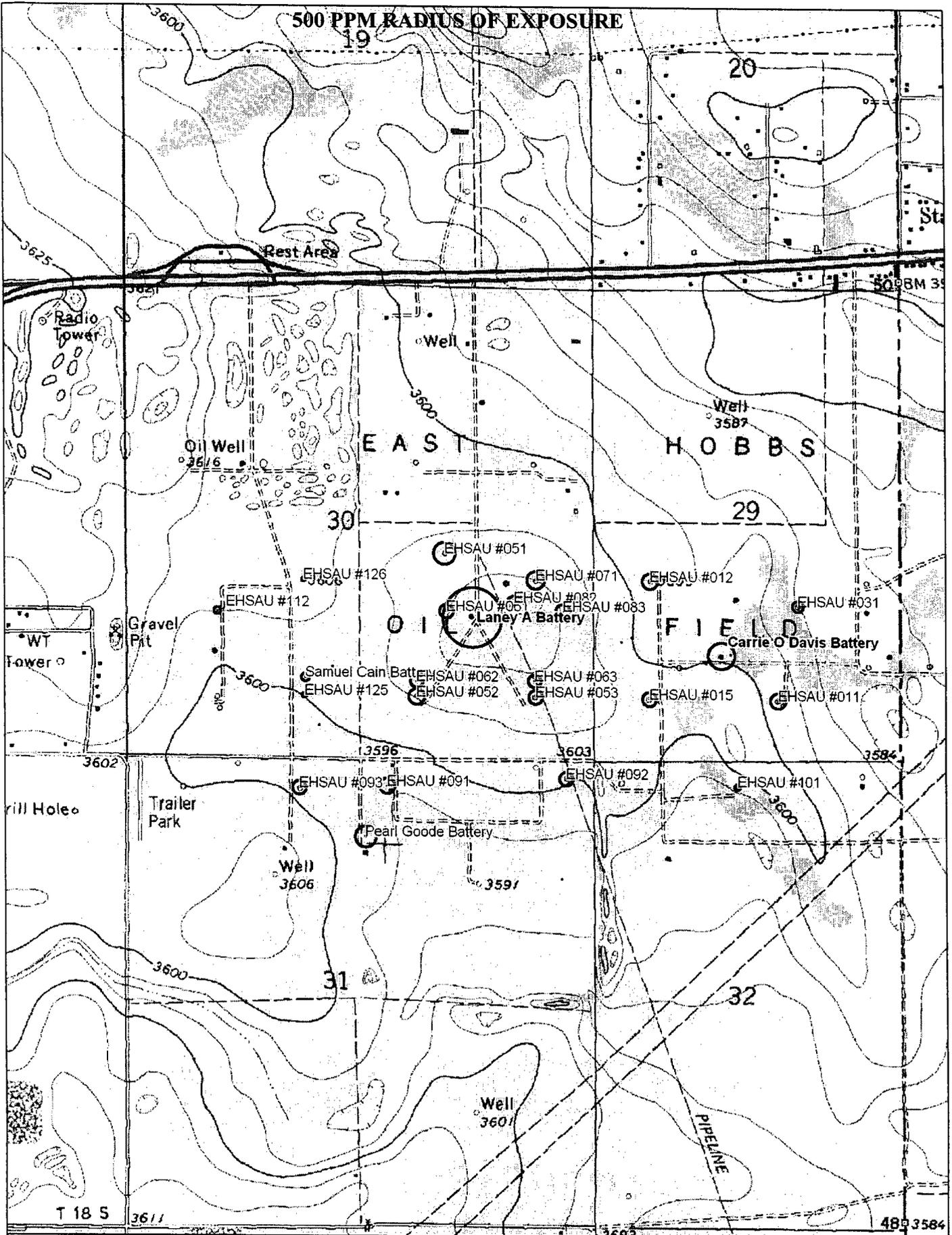
MN

9.8°E



DELORME

500 PPM RADIUS OF EXPOSURE



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Scale 1 : 17,600
1" = 1470 ft

