

# Remediation of Petroleum Hydrocarbons Released to the Subsurface

Stephen G. Reuter  
Geologist Manager

Petroleum Storage Tank Bureau  
New Mexico Environment Department

[stephen.reuter@state.nm.us](mailto:stephen.reuter@state.nm.us)

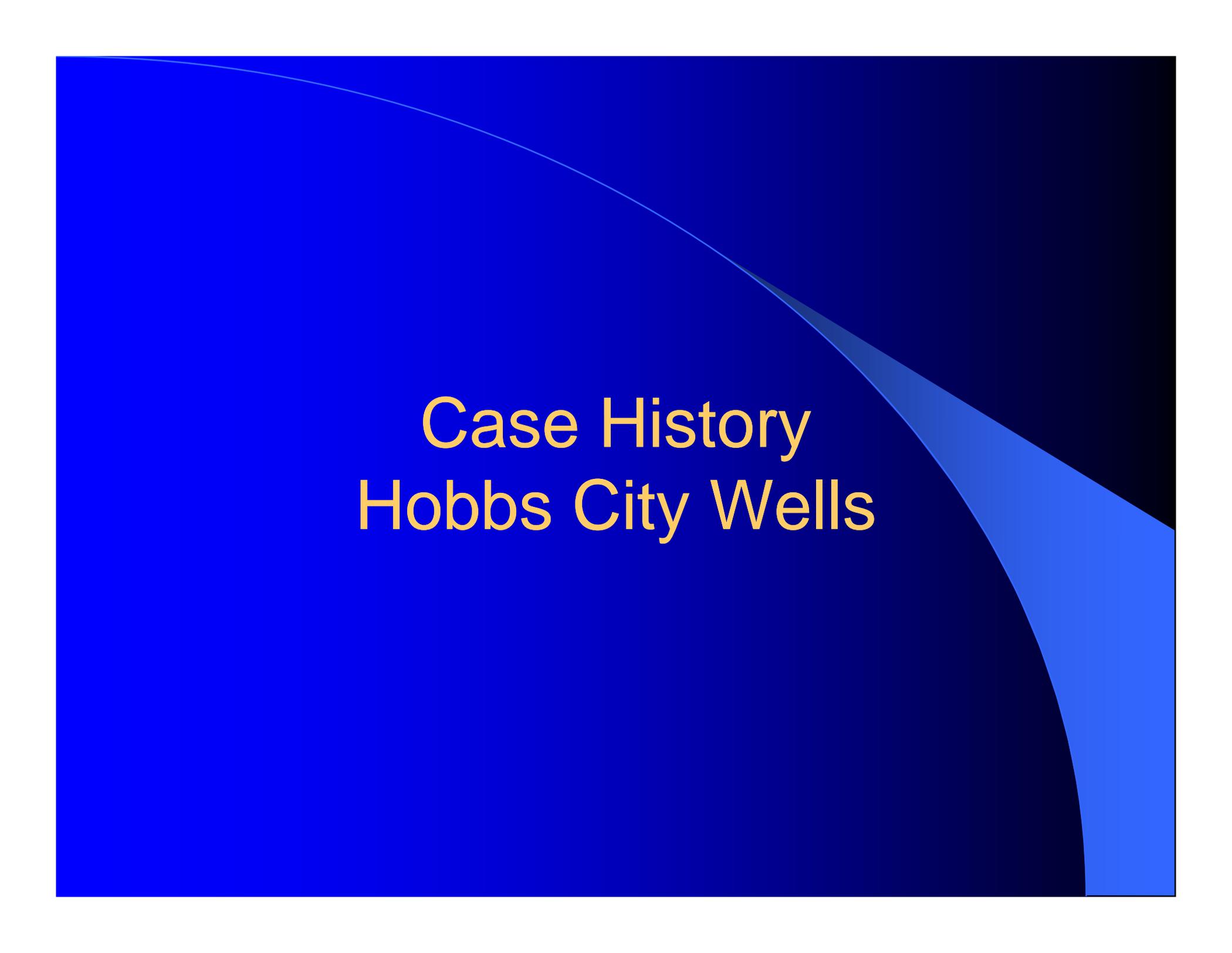
505-222-9577

# Program Overview

- Petroleum Inspection Group
  - Prevention & Inspection
  - Funded by Federal UST, Tank Fees, Corrective Action Fund
- Remedial Action Technical Staff
  - Corrective Action at LUST sites
  - Funded by federal LUST, CAF

# Remediation Universe

- Approximately 976 active LUST sites
- NFA an average 45 sites/year past 5 years
- Average 20 new releases/year past 5 years
- Average Cost to Clean-up \$350,000/site
- Larger sites can cost \$5,000,000+

The background is a solid blue gradient that transitions from a lighter blue on the left to a darker blue on the right. A thin, light blue curved line starts at the top left and arcs across the upper portion of the slide. In the bottom right corner, there is a triangular shape that is a lighter shade of blue, pointing towards the center.

# Case History Hobbs City Wells

# Comparison

- KAFB-BFF

- GW Plume ~120 acres
- NAPL Plume 55 acres
- Depth to GW ~490'bgs
- Av Gas/Jet Fuel

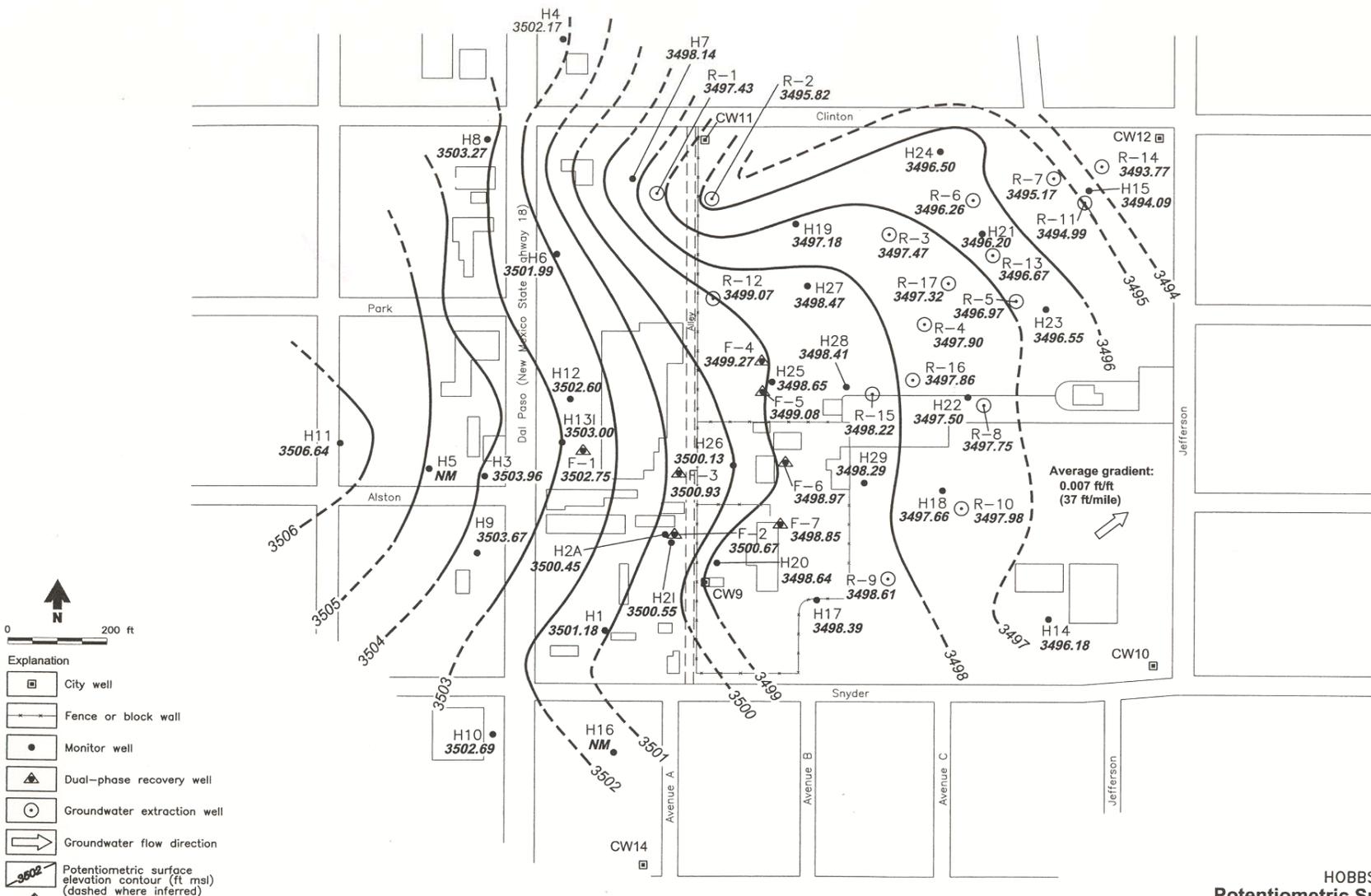
- Hobbs City Wells

- GW Plume 25 acres
- NAPL Plume 5 acres
- Depth to GW ~120'bgs
- Gasoline/diesel

# Remediation System

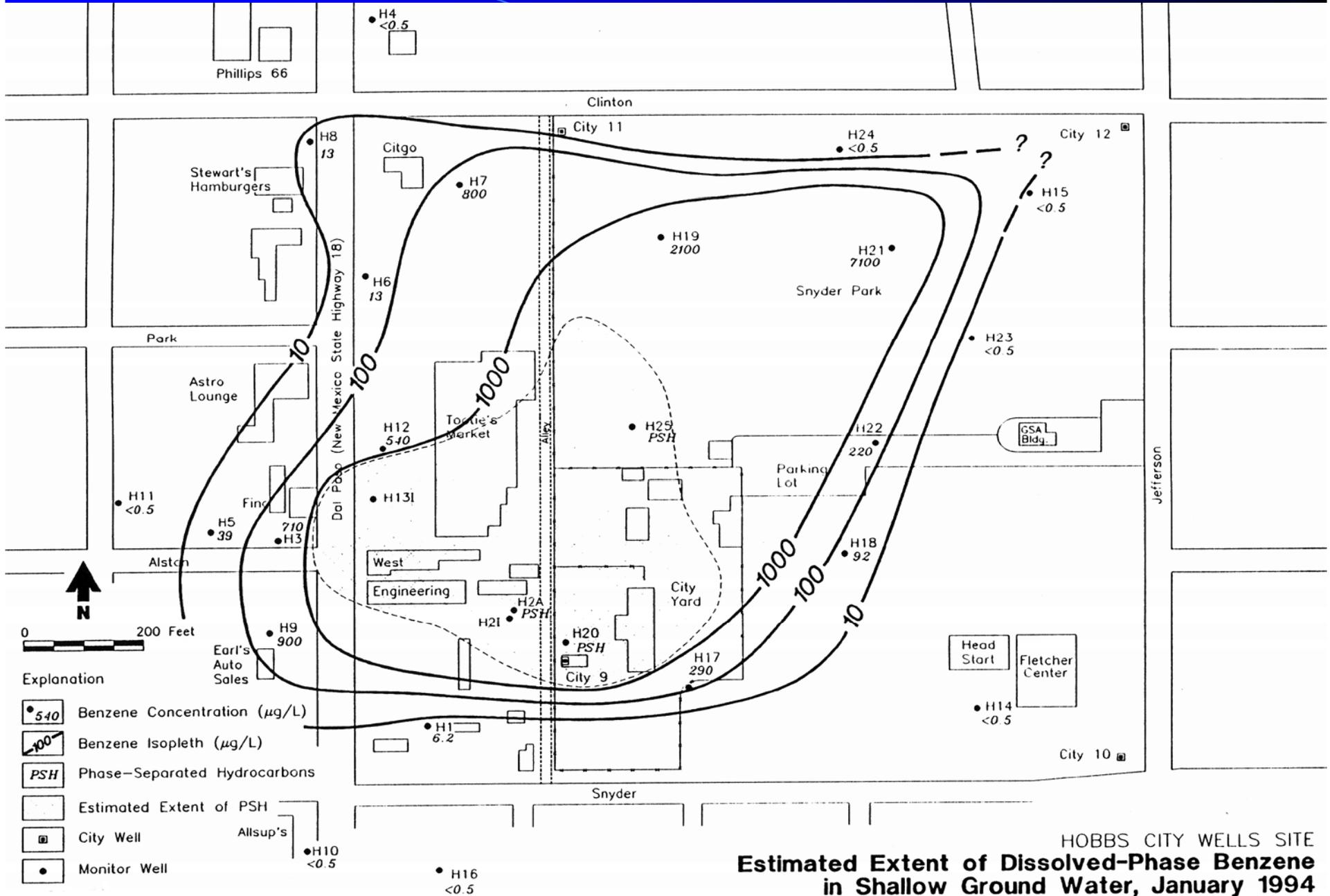
- 25 dual-phase and groundwater recovery wells
- Two independent SVE systems consisting of 63 vapor extraction wells
- Air stripper tower
- Two 1,300 cfm blowers

# Site Groundwater Elevations



HOBBS CITY WELLS SITE  
Potentiometric Surface Elevations  
August 4 and 5, 2003

# Contaminant Plume Initial



- Explanation**
- 540 Benzene Concentration ( $\mu\text{g/L}$ )
  - 100 Benzene Isopleth ( $\mu\text{g/L}$ )
  - PSH Phase-Separated Hydrocarbons
  - Estimated Extent of PSH
  - City Well
  - Monitor Well

HOBBS CITY WELLS SITE  
**Estimated Extent of Dissolved-Phase Benzene  
 in Shallow Ground Water, January 1994**



# Contaminant Plume after 8 yrs

0.41 acres



The background is a solid blue color with a subtle gradient. A thin, light blue curved line starts from the top left and arcs across the upper portion of the slide. On the right side, there is a vertical gradient bar that transitions from a darker blue at the top to a lighter blue at the bottom.

# Case History

## Burrows Site-Milan, NM

# Comparison

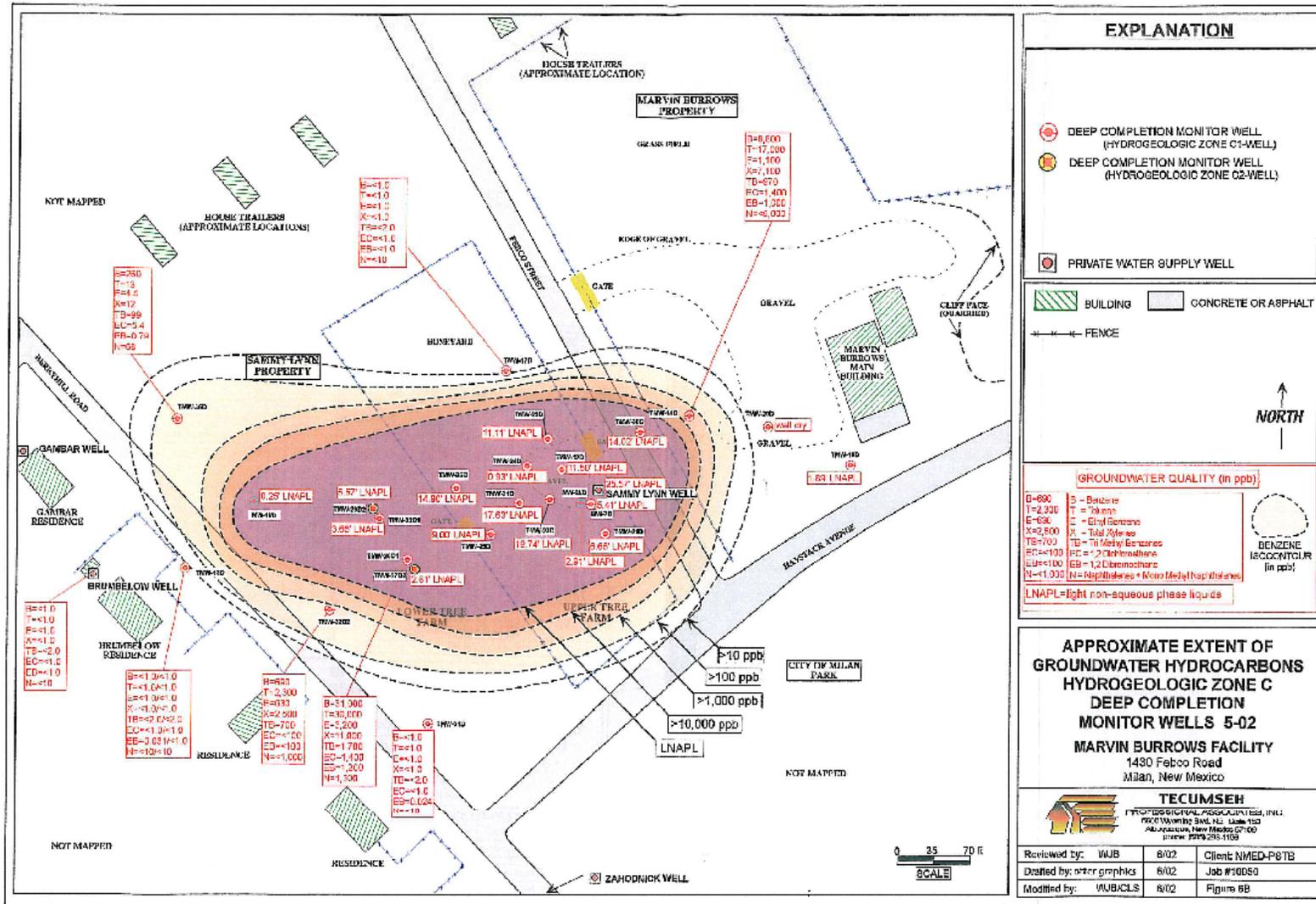
## **KAFB**

- GW Plume 120 acres
- NAPL Plume 55 acres
- Depth to GW ~490' bgs
- Simpler geology

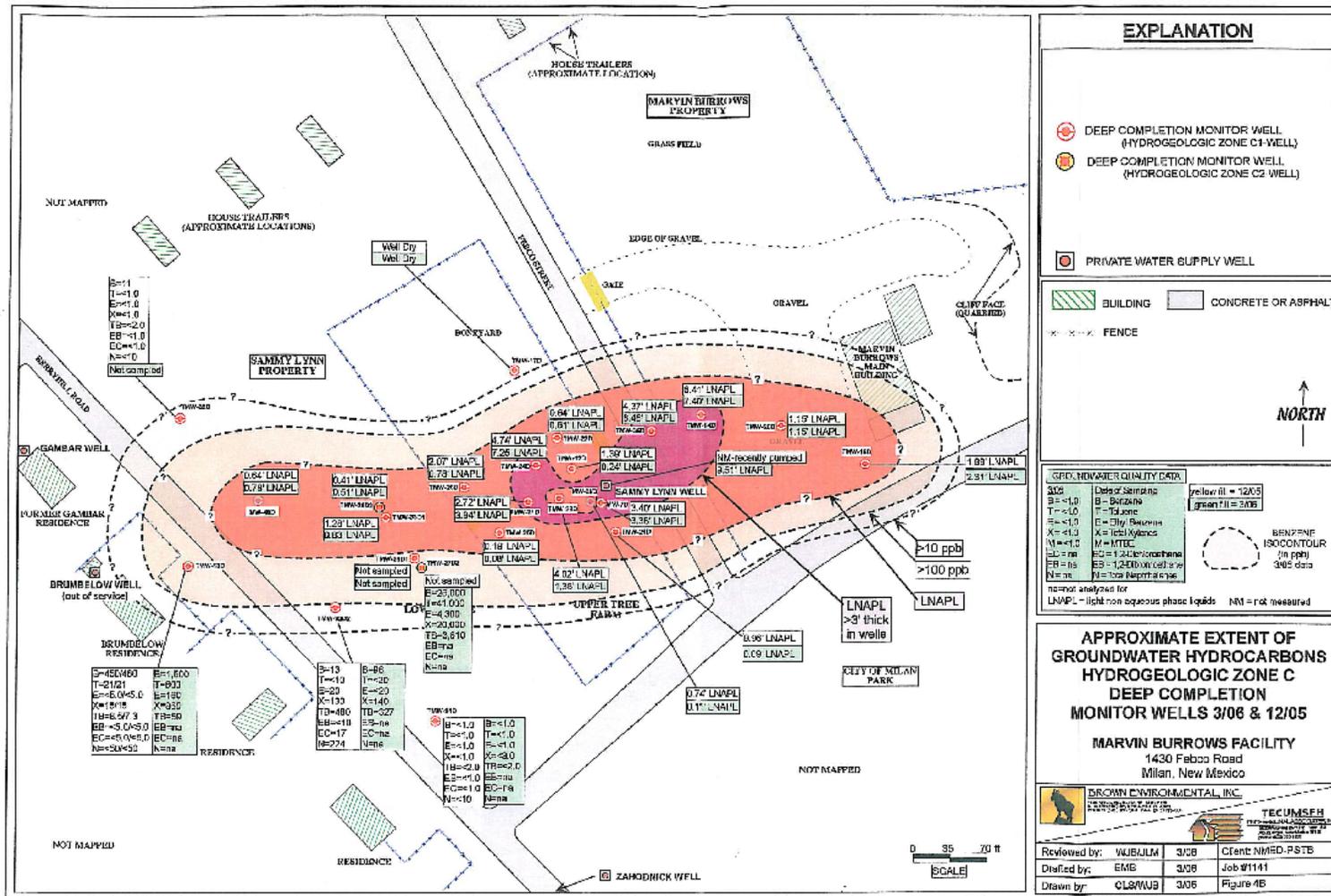
## **Burrows**

- GW Plume 4 acres
- NAPL Plume 2 acres
- Depth to GW ~150' bgs
- Complex geology

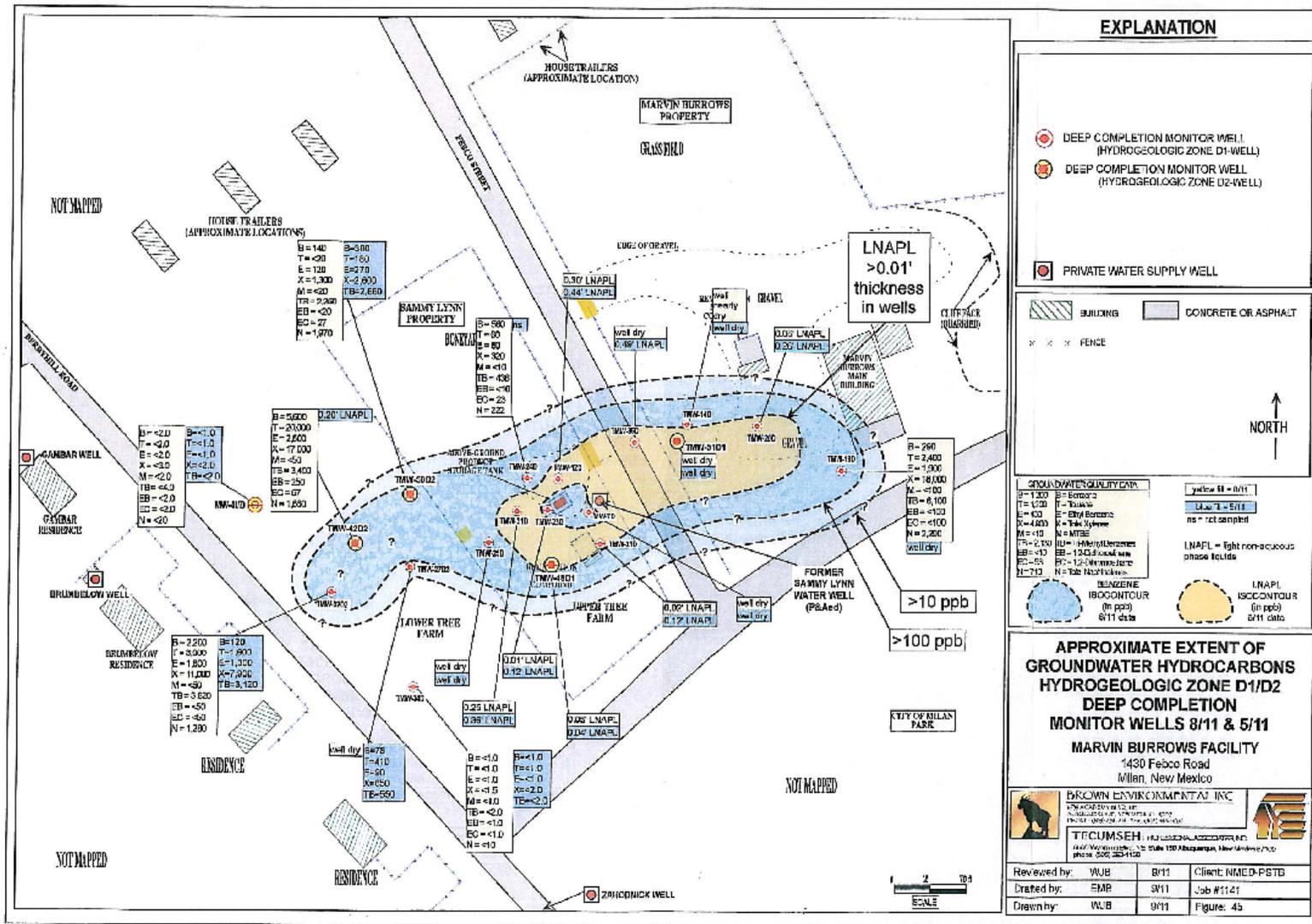
# Contaminant Plume-Initial



# Contaminant Plume after 4 years



# Contaminant Plume Today (11 yrs)









# Summary

- Problem is not new
- Remedial technology has/will improve
- Innovative solutions can be applied