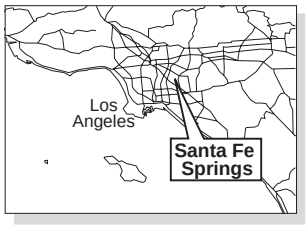
EPA Waste Disposal, Inc. (WDI) Superfund Site



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 9 • SAN FRANCISCO, CALIFORNIA • AUGUST 1999

RESULTS OF REMEDIAL DESIGN INVESTIGATION SITE CONDITIONS: SUBSURFACE GAS AND IN-BUILDING AIR

Santa Fe Springs, California

This fact sheet summarizes the results of the subsurface soil gas investigations and related studies completed during 1997-1999 at the Waste Disposal, Inc. (WDI) Superfund site. The U.S. Environmental Protection Agency (EPA) and the Waste Disposal, Inc. Group (WDIG), the parties named in EPA's enforcement order, have conducted additional investigations at the site to reevaluate and revise the remedial design for the site. EPA fact sheets issued previously in 1999 discussed the investigative findings for groundwater and the extent of liquid and solid waste at the site.

At a Glance...

- **Contaminants (volatile organic compounds [VOCs] and methane) have been detected on-site in subsurface gases.**
- **The primary VOCs are benzene, vinyl chloride, trichloroethene (TCE), and tetrachloroethene (PCE).**
- **Elevated levels of these contaminants have been detected both inside the reservoir and in localized areas outside of the reservoir, including near some on-site buildings.**
- **Subsurface gases do not appear to be impacting air quality (i.e., outdoor breathing air).**
- **Air monitoring has detected some chemicals in some on-site buildings, but these chemicals also appear to be used or stored by these businesses.**
- **In-building air monitoring and subsurface gas monitoring continues on a quarterly basis.**

WHAT IS SOIL GAS?

Soil gas refers to gaseous elements and compounds found in the ground in the small spaces between particles of earth. Soil gas can move through soil or cracks in rock, depending on changes in pressure. At the WDI site, EPA is primarily concerned about potential exposure to methane and volatile organic compounds (VOCs) from soil gas. Methane is a colorless, odorless, nonpoisonous gas produced in landfills as organic material in the landfill decomposes. Methane is highly flammable and explosive above certain concentrations. "VOCs" is a broad term referring to certain gases that are organic compounds that evaporate easily or may undergo chemical reactions when exposed to the atmosphere. Many of the VOCs found at the WDI site are associated with petroleum waste and/or solvents, e.g., benzene, toluene, ethylbenzene, and xylene (collectively referred to as BTEX), trichloroethene (TCE), tetrachloroethene (PCE), and vinyl chloride.

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HISTORICAL BACKGROUND

Soil gas investigations and sampling were conducted at the WDI site in 1988-1989, 1995, and 1997-1999. Both EPA and the WDIG have collected an extensive amount of data to characterize subsurface gas conditions and identify areas of the site where soil gas contaminants have been detected.

Figure 1 is a map showing the location of all the existing soil gas monitoring wells installed during the soil gas investigations. The soil gas monitoring well network includes 61 monitoring wells. The following discussion summarizes the objectives and results of the soil gas investigations, including the in-building monitoring and Soil Vapor Extraction (SVE) testing, conducted to date.

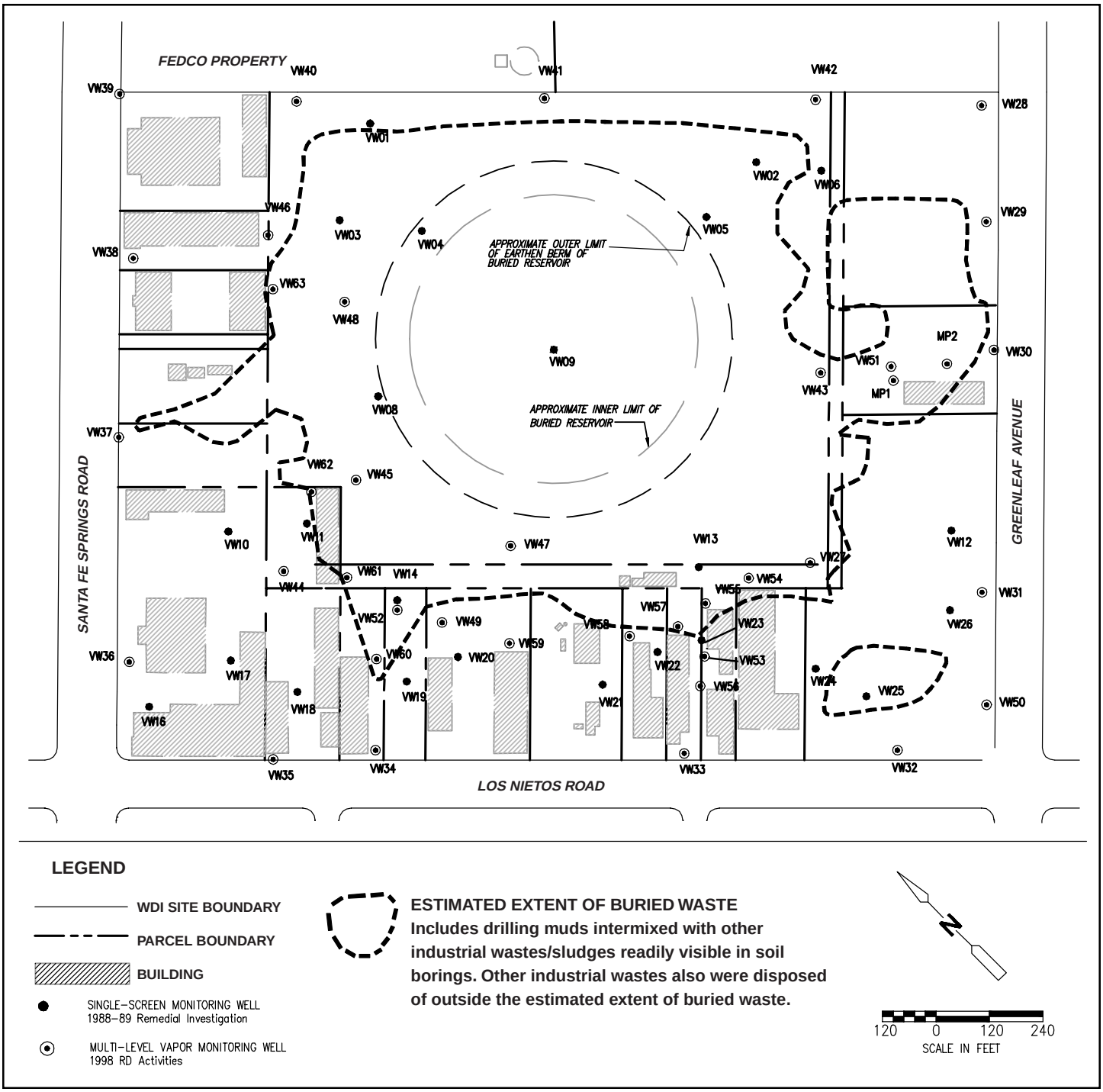

Figure 1: Existing Soil Gas Monitoring Wells

PAST INVESTIGATIONS: 1988-1989, and 1995

In 1988-1989, EPA installed 26 soil gas (or vapor) monitoring wells during the Remedial Investigation (RI) conducted at the site. Soil gas samples collected from these wells were analyzed for VOCs and methane. The highest concentrations of VOCs and methane were detected inside the reservoir.

In 1995, the WDIG collected soil gas samples as part of the remedial design activities. The WDIG detected elevated methane and VOC concentrations outside of the reservoir, in areas near some of the on-site buildings. These results prompted EPA to require the WDIG to complete additional subsurface gas investigations at the site to determine if soil gas was migrating from the reservoir or was related to other wastes disposed outside the reservoir.

OBJECTIVES AND RESULTS OF RECENT INVESTIGATIONS

Beginning in 1997, EPA and WDIG expanded their investigation of soil gas at the site. The objectives of this investigation were the following:

• Update an inventory of all chemicals found in the subsurface gases at the site; and

• Identify locations with elevated methane and VOC soil gas concentrations both on-site (including adjacent to on-site buildings) and at the boundaries of the site;

• Determine the potential for subsurface gas generation and migration near on-site buildings;

• Determine if subsurface gas migration could be impacting indoor air quality;

• Collect data for evaluating final soil gas cleanup technologies and alternatives for use in remedial design.

SOIL GAS INVESTIGATIVE ACTIVITIES

During the summer of 1997, EPA collected over 200 soil gas samples at 186 locations throughout the site at various depths. Elevated levels of VOCs were detected at 11 of the 186 sample locations. Most of the 11 samples with elevated levels of VOCs were collected from the reservoir or adjacent to the reservoir. The VOC detected at elevated levels most frequently was benzene, followed by vinyl chloride and PCE. High concentrations of methane were detected at 26 of the 186 sampling locations.

NEW WELLS INSTALLED

In 1998, the WDIG and EPA installed 37 new vapor monitoring wells to allow soil gas samples to be collected from various depths (see Figure 2). Sixteen of the new vapor wells were installed along the perimeter of the WDI site to monitor for potential subsurface migration of soil

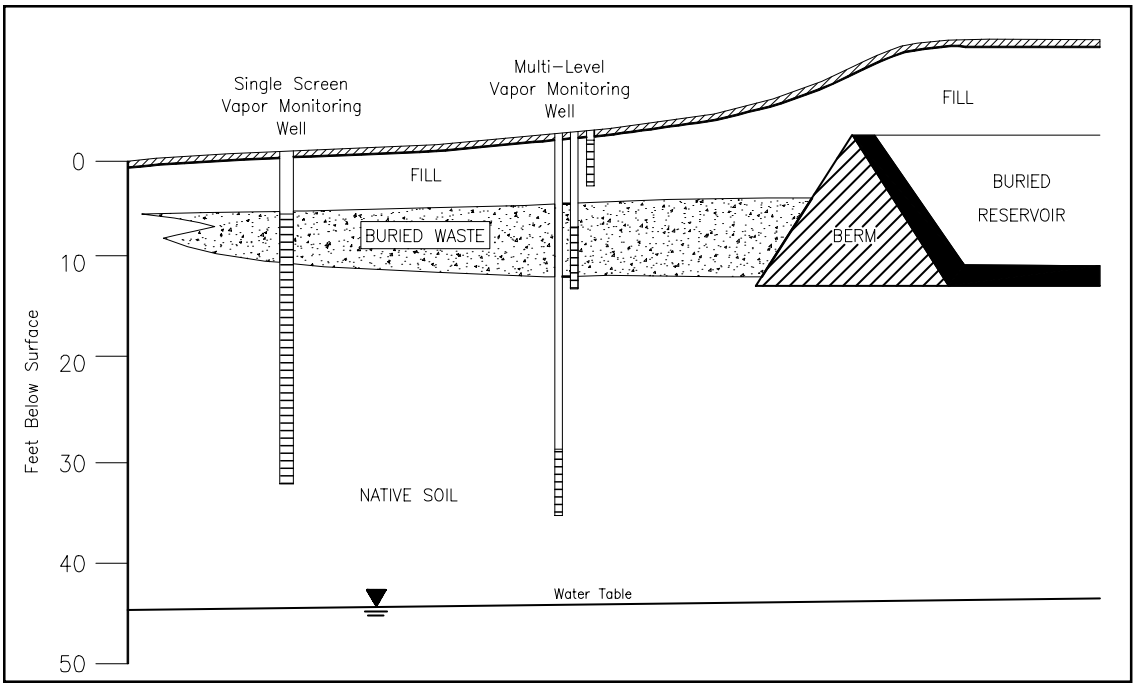

Figure 2: Schematic View of WDI Vapor Monitoring Wells

gas outside of the site boundary. The other 21 vapor monitoring wells were installed between the reservoir and on-site buildings.

There are currently 61 soil vapor wells in the monitoring network. The WDIG monitors these wells quarterly. Seven quarterly monitoring rounds have been completed to date. Figure 1 shows the location of all vapor monitoring wells.

SUBSURFACE SOIL GAS FINDINGS

A total of 48 chemicals were detected during the 1997-1999 sampling of the subsurface gases. Of these 48 chemicals, 16 chemicals have been initially identified by EPA as potential chemicals of concern (COCs). COCs are chemicals that have a potential to pose a threat to human health; therefore, they will be monitored closely in the future. The primary COCs at the WDI site appear to be methane, because of its explosion potential, and vinyl chloride and benzene, two VOCs which are known human carcinogens. COCs most frequently detected are methane, benzene, toluene, ethylbenzene, trichloroethene (TCE), tetrachloroethene (PCE), vinyl chloride, and 1,1,1-trichloroethane (1,1,1-TCA).

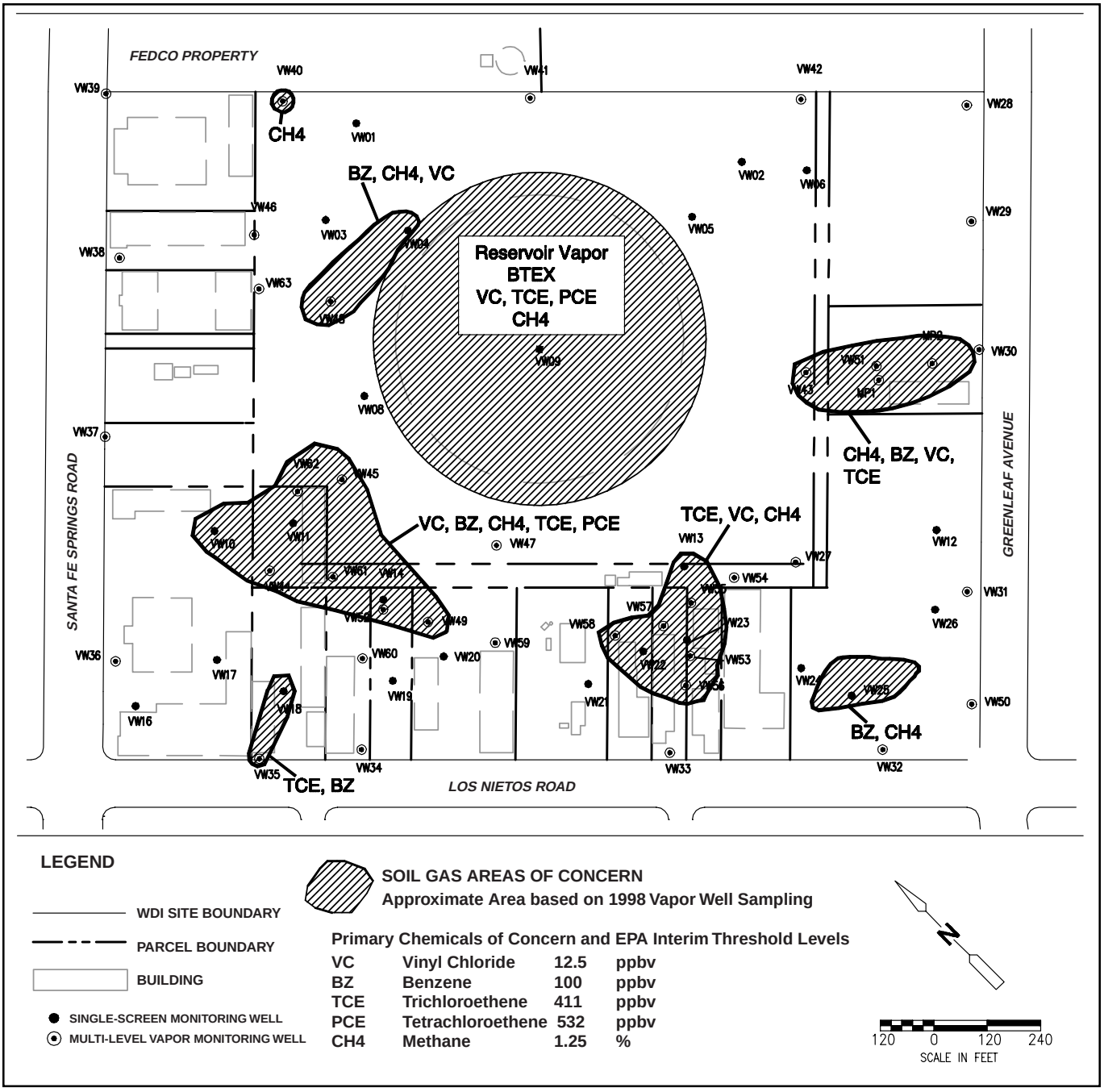

Figure 3: Soil Gas Areas of Concern

The reservoir area contains the highest concentrations of soil gas VOCs. Outside of the reservoir, the distribution of soil gas chemicals is variable across the site reflecting the composition and degradation of buried waste (see Figures 1 and 3).

Six areas outside the reservoir were found to have concentrations of one or more of the VOCs at or above EPA's interim threshold levels (see Figure 3). The interim threshold levels for the WDI site are based on the chemical's toxicity. If the threshold levels are exceeded, EPA uses this information as one measure to determine a need for further investigation.

IN-BUILDING AIR MONITORING

Because of the elevated concentrations of VOCs and methane detected near some of the on-site buildings, EPA implemented an in-building air quality monitoring program in 1997 to determine if soil gas was migrating into any on-site buildings. In-building air samples were collected from all 22 buildings at the WDI site. In three of the buildings sampled, VOCs were detected in the indoor air samples at levels above the EPA's interim threshold level. Site inspections of the buildings were conducted to determine whether any VOCs detected within the buildings were related to chemical products used or stored by the occupants of the buildings. The results of the inventory indicated that the VOCs detected in the buildings may be due to paints, solvents, and other materials used within the buildings rather than to subsurface soil gas migration. Since 1998, in-building air sampling has been conducted quarterly at six on-site buildings in areas of concern based on the subsurface soil gas data results. EPA continues to closely monitor the in-building air sample results.

OUTDOOR AIR MONITORING

At the same time that the indoor air samples were collected, for comparison purposes, samples of outdoor air were collected to measure background (air coming from upwind of the site) concentrations of methane and VOCs. Outdoor air samples were collected at the corner of Greenleaf Avenue and Los Nietos Road. This location at the southern corner of the site was selected because prevailing winds come from the ocean to the west towards the site. These outdoor air samples were analyzed for 21 gases, including VOCs and methane. Only benzene was detected at levels above ambient (outdoor) air standards in these samples. These results are similar to sampling results of background Los Angeles air quality, which is known to exceed EPA's air quality standards for benzene.

SOIL VAPOR EXTRACTION (SVE) TESTING

During the Fall of 1998, the WDIG implemented a soil vapor extraction (SVE) testing program at the WDI site to evaluate the feasibility of this technology for controlling and reducing soil gas at the site. SVE systems often are used to remove soil gases from subsurface soils prior to treatment to remove contaminants. The study was designed additionally to provide data regarding vapor treatment effectiveness and gas generation rates at the site. The SVE studies were conducted in five areas of the site identified as soil gas areas of concern (see Figures 3 and 4).

The SVE tests at all locations demonstrated that SVE technology could remove subsurface gases and prevent movement of soil gas either into on-site buildings or beyond the perimeter of the site. During the tests, concentrations of methane and VOCs were significantly reduced. The use of SVE as a gas control remedy will be further evaluated as a remedial alternative.

ONGOING MONITORING ACTIVITIES

The following monitoring activities are continuing for subsurface soil gas and indoor and outdoor air quality:

- Quarterly subsurface soil gas monitoring;
- Quarterly in-building and ambient (outdoor) air monitoring, including along the upwind and downwind perimeters of the site;
- Review and analysis of quarterly data for soil gas conditions and trends near on-site buildings and at the site perimeter; and
- Oversight by EPA of the WDIG's soil gas monitoring activities, including collection of independent, duplicate samples for quality assurance purposes.

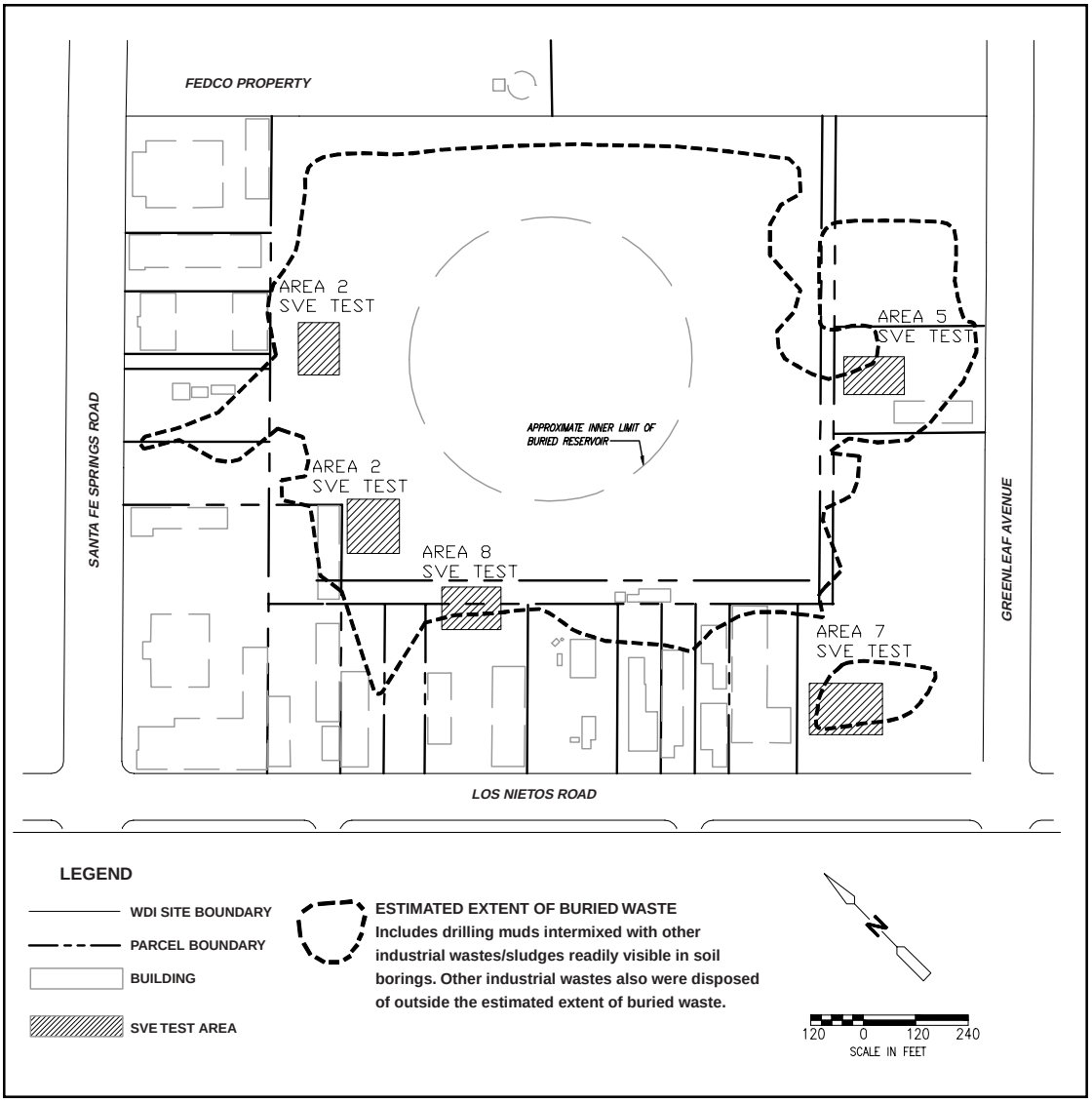

Figure 4: SVE Test Areas

REMEDIAL ALTERNATIVES TO BE ANALYZED

As discussed in EPA's previous fact sheets, the Remedial Design Investigative Activities Summary Report (Report) will summarize and evaluate all the soil gas data collected both recently and in the past. Soil gas trends and migration potential will be analyzed and discussed in the final Report. Various alternatives for controlling or reducing subsurface gas levels, including SVE, will be considered and compared in the Supplemental Feasibility Study (FS) scheduled to be drafted in late 1999.

Subsurface gases are commonly found in industrial areas and, consequently, manufacturers have developed various types of cleanup technologies, including SVE (discussed earlier in this fact sheet), which will be considered in the Supplemental FS. Based on the analyses in the Supplemental FS, EPA plans to issue a Proposed Plan by early year 2000 containing final cleanup recommendations for community and public comment. ■

SITE BACKGROUND

The WDI Superfund site is located in the City of Santa Fe Springs, Los Angeles County, California, on approximately 40 acres of land divided into multiple parcels. The site is surrounded by commercial and industrial areas to the north, west and south, residential areas to the east, and a school athletic field along the northeastern corner. At its center, the WDI site contains a buried 42-million gallon capacity concrete reservoir originally constructed for crude petroleum storage. The reservoir was decommissioned in the late 1920s, but was used until the mid-1960s for disposal of a variety of hazardous substances including both liquid and solid wastes. Wastes disposed of at the site include petroleum-related chemicals, solvents, sludges, construction debris, drilling muds, and other waste materials. Historical aerial photographs show that liquids were discharged to the reservoir and into bermed areas surrounding the reservoir. The reservoir and portions of the site area were covered with soil during the 1960s. Soil borings indicate that the reservoir is covered by 5 to 10 feet of fill soil.

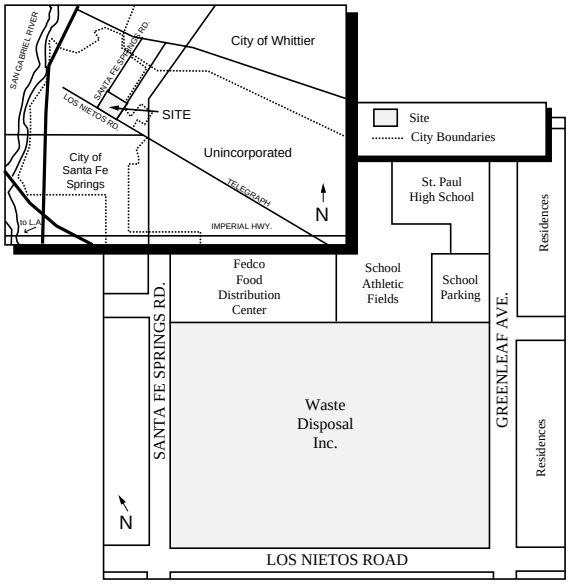

Figure 5: *Location of WDI, Inc. Superfund site*

INFORMATION REPOSITORIES

Technical reports used to prepare this fact sheet will be available later this year. The Administrative Record for the 1993 Record of Decision (ROD), including EPA's 1988-1989 Remedial Investigation Report and EPA's 1993 Feasibility Study, is currently available at the information repositories. The local information repositories are at the following two locations:

City of Santa Fe Springs Library
11700 Telegraph Road
City of Santa Fe Springs, CA 90670

St. Paul's High School Library
9635 Greenleaf Avenue
City of Santa Fe Springs, CA 90670

For more detailed information...

If you have any questions or concerns, please contact:

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