

## Teledyne-Singer Site Enhancement to the Remedial Action Plan



*DTSC is one of six  
Boards and  
Departments within  
the California  
Environmental  
Protection Agency.  
The Department's  
mission is to restore,  
protect and enhance  
the environment,  
to ensure public health,  
environmental  
quality and  
economic vitality,  
by regulating  
hazardous waste,  
conducting and  
overseeing  
cleanups, and  
developing  
and promoting  
pollution prevention.*

State of California



California  
Environmental  
Protection Agency



### Introduction

This fact sheet is the fifth in a series, about the Teledyne-Singer Site located at 3176 Porter Drive in Palo Alto, California (see Figure 1, Page 2).

The **Department of Toxic Substances Control (DTSC)** has prepared this fact sheet to inform the community about an enhancement to the **Remedial Action Plan (RAP)**, approved for the Teledyne-Singer Site in 1992, which selected groundwater extraction and treatment as the remedy to clean up the contaminated groundwater.

DTSC has approved the **In-Situ Reactive Zone (IRZ) Technology** (see Page 3) as an enhancement to the groundwater extraction and treatment system now being used at the Site. Installation of the IRZ Technology is planned for December 2003.

DTSC has also prepared a **Notice of Exemption (NOE)** to comply with the **California Environmental Quality Act (CEQA)**. The NOE is issued when a project will not have a significant adverse effect on the environment.

A copy of the CEQA Notice of Exemption, the workplan for installation of the IRZ system and other site documents are available at the information repositories listed on the back page of this fact sheet.

\* Terms in **bold** are defined in the Glossary (see Page 5).

### Public Involvement

DTSC continues to encourage the exchange of information with interested members of the community.

For further information, contact:

#### Department of Toxic Substances Control

700 Heinz Avenue,  
Suite 200  
Berkeley, California  
94710-2737

#### If you have concerns or questions please contact:

Xavier Bryant,  
DTSC Project Manager,  
at (510) 540-3835

Rachelle Maricq,  
DTSC Public Participation  
Specialist,  
at (510) 540-3910 or

Media inquiries should be directed to Angela Blanchette, DTSC Public Information Officer, at (510) 540-3732

## Site Background

The Teledyne-Singer Site is located at 3176 Porter Drive within the Stanford Research Park in Palo Alto, California, near the intersection of Foothill Expressway and Hillview Avenue (see Figure 1).

The Teledyne-Singer Site is located in an area of commercial properties and is a little more than a quarter mile from the Baron Park Neighborhood which is comprised of mostly single family homes.

DTSC considers schools, day care centers and hospitals as sensitive receptors and has identified four schools and one hospital within a mile of the Teledyne-Singer Site.

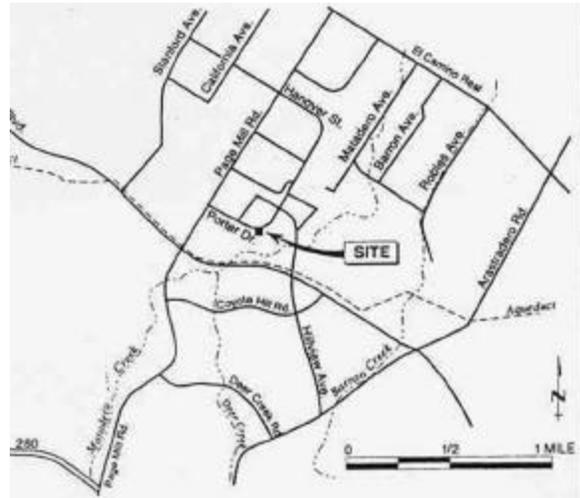
The Teledyne-Singer Site is part of a larger area designated by DTSC as the Hillview-Porter Region that also includes eight other contamination sites located within the Stanford Research Park, portions of the Veterans Administration Hospital property and portions of the Barron Park Neighborhood.

Since 1991, Lockheed Martin Corporation (LMC) has operated at 3176 Porter Drive. Former occupants include:

- 1960 - 1969 Alfred Electronics,
- 1969 - 1975 Librascope/Singer, and
- 1975 - 1987 Teledyne MEC.

## Site Investigations and Activities

Previous investigations identified **Volatile Organic Compounds (VOCs)** in the subsurface soil and groundwater. The following sources of VOCs at the Teledyne-Singer Site were identified:



**Figure 1. Teledyne-Singer Site Location**

- An underground industrial waste clarifier sump located on the eastern side of the former building. The sump was excavated and removed in June 1987. Additional soil impacted with chlorinated solvents was excavated and removed in September 1990.
- A 100-gallon underground storage tank was located on the south side of the former building. The tank was removed in January 1986.
- The migration of VOCs in groundwater, from an off-site source onto the Teledyne-Singer Site.

DTSC approved the Final RAP in 1992. The RAP selected containment and reduction of the contaminant plume using a groundwater extraction and treatment system as the preferred remedy. The system was operational beginning in 1993.

Following the start-up of the system, the highest concentration of VOCs was 95,000 parts per billion (ppb), primarily as **tetrachloroethene (PCE)**.

The groundwater extraction and treatment system was effective at containing the plume and initially removing contaminants from groundwater. However, the contaminant removal rate decreased over

time. Therefore, in February 2001, DTSC approved the performance of a pilot test to evaluate the effectiveness of the IRZ technology.

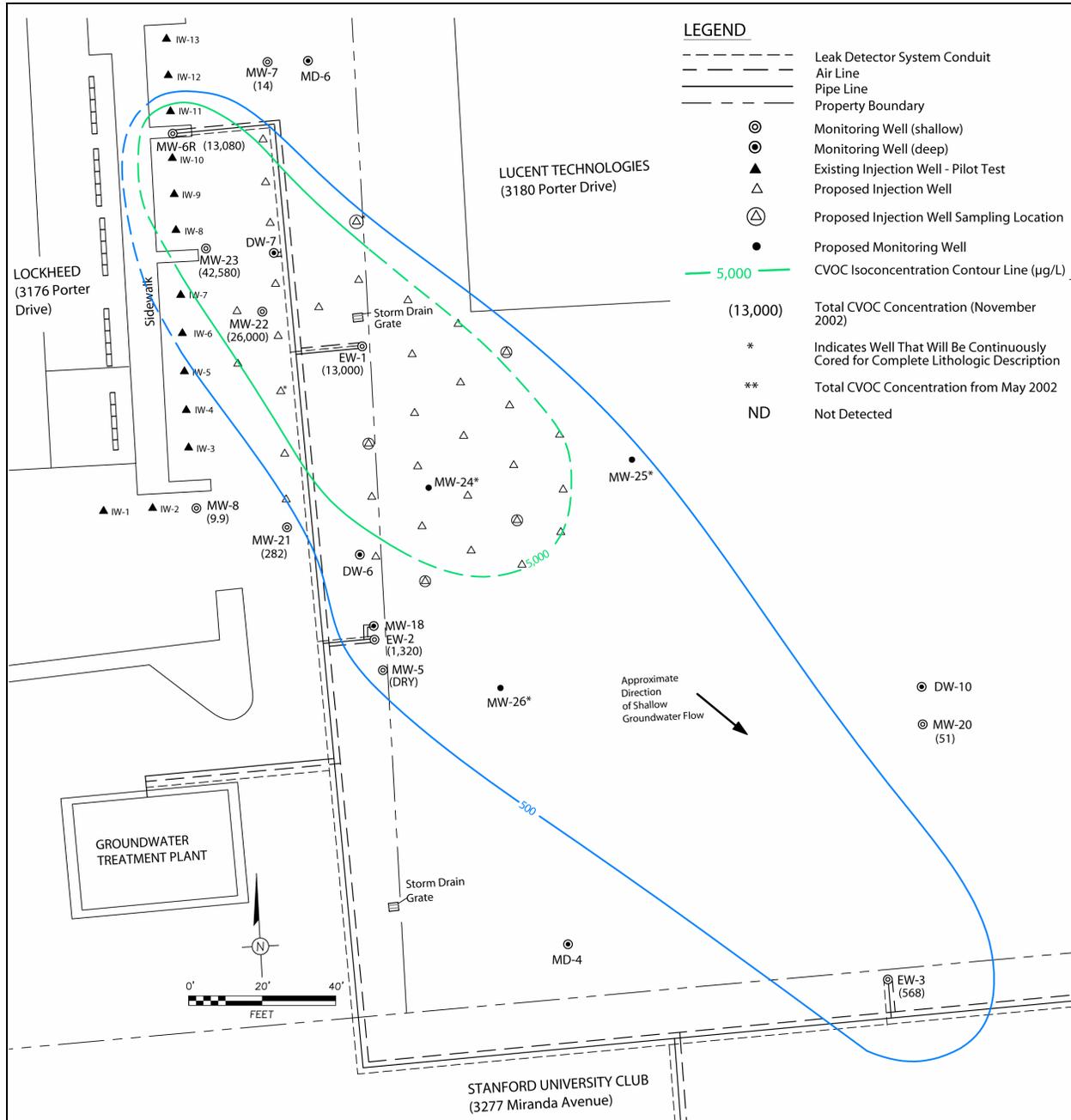


Figure 2. Proposed IRZ Well Locations

## Pilot Test Activities and Results

The pilot test evaluated the use of bioremediation to enhance the groundwater extraction and treatment system used at the site. The pilot test was conducted near the east side of the building, in the area with the highest concentrations of PCE (see Figure 2, Page 3).

The IRZ technology is a bioremediation process which utilizes naturally-occurring microorganisms to reduce the amount of PCE dissolved in the groundwater and adsorbed to the soil.

A food source is added to the groundwater to feed the microorganisms in the subsurface, thus increasing their population.

These microorganisms use up the available oxygen to produce energy as they consume the food source. When the oxygen in groundwater is depleted, the microorganisms are forced to use other substances to produce energy. Some of these microorganisms are able to substitute VOCs for the depleted oxygen to produce the energy required for metabolism.

When VOCs are substituted for oxygen to produce energy, they are broken down through a series of reactions into nontoxic constituents. This process is different than the groundwater extraction and treatment system, which physically pumps groundwater from the subsurface and removes the VOCs with a carbon filtration system.

The pilot test successfully distributed food to the microorganisms in the subsurface, increased the population of microorganisms,

depleted the available oxygen, and initiated the breakdown of VOCs.

Therefore, the pilot study showed that using the IRZ technology will enhance the performance of the groundwater extraction and treatment system.

## Proposed Expansion

DTSC will oversee the expansion of the IRZ system across a larger part of the plume. The expanded system will treat impacted groundwater near and downgradient of the source area (see Figure 2, Page 3).

About 35 new permanent injection wells will be installed at 3176 Porter Drive (Teledyne-Singer Site) and at 3180 Porter Drive (Lucent Technologies facility). Under the supervision of DTSC, construction of the system expansion will begin in December 2003. Injection of the food source (molasses) is scheduled to begin in January 2004.

To monitor the IRZ process, three new monitoring wells will be placed in the expanded treatment area. Based on data observed during the pilot test, significant reductions to contaminant levels in soil and groundwater are expected to occur within about 12 months.

The groundwater extraction and treatment system will continue to operate and will ensure that control of the groundwater plume is maintained. If the IRZ enhancement is found to interfere with the proper operation of the groundwater extraction and treatment system, it will be modified as needed.

## Glossary

### **California Environmental Quality Act (CEQA)**

The California law that establishes a framework for policy decisions regarding actions that may have significant effects on the environment. All state and local agencies are required to comply with CEQA prior to taking discretionary actions.

### **Department of Toxic Substances Control (DTSC)**

A department within the California Environmental Protection Agency, which oversees the investigation and remediation of sites like the Teledyne-Singer site.

### **In-Situ Reactive Zone (IRZ) Technology**

This technology utilizes a carbon food source injected into the subsurface to stimulate the naturally occurring microorganisms in the subsurface. The microorganisms then deplete the dissolved oxygen in groundwater and create a treatment zone in which the contaminants are degraded and, ultimately, destroyed. At the Teledyne-Singer Site, ARCADIS has utilized molasses as the carbon food source.

### **Notice of Exemption (NOE)**

A California Environmental Quality Act document issued by the lead regulatory agency, such as DTSC, when the initial environmental study reveals no substantial evidence that the proposed project will have a significant adverse effect on the environment.

### **Remedial Action Plan (RAP)**

A plan approved by DTSC that outlines a specific program leading to the remediation of a contaminated site.

### **Tetrachloroethene (PCE)**

A colorless liquid used as a vapor-degreasing solvent, drying agent for metals and certain other solids, and heat-transfer medium.

### **Volatile Organic Compounds (VOCs)**

Any hydrocarbon, except methane and ethane, that readily evaporates at temperatures normally found at ground level and shallow depths.

## **For More Information**

If you would like more information about the Site, please call Project Manager, Xavier Bryant at (510) 540-3835 or Public Participation Specialist, Rachelle Maricq at (510) 540-3910. For media inquiries contact Angela Blanchette, DTSC Public Information Officer at (510)540-3732.

## **Information Repositories**

The Notice of Exemption and the IRZ Injection System Expansion Work Plan, which are part of the Administrative Record for the site, as well as other documents relating to the Site, are available for public review at the following locations:

DTSC Regional Files  
700 Heinz Avenue  
Berkeley, California 94710  
call for appointment  
(510) 540-3910

The United States Geological Survey Library  
345 Middlefield Road  
Menlo Park, California 94025  
(650) 329-3027

## **Notice to Hearing Impaired Individuals**

TDD users can obtain additional information about the Site by using the California State Relay Service (1-888-877-5378) to reach Rachelle Maricq, Public Participation Specialist, at (510) 540-3910.