



# Fresno Sanitary Landfill Superfund Site



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX SAN FRANCISCO, CALIFORNIA

Fresno, California

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## EPA Completes Five-Year Review of Cleanup at Site

The United States Environmental Protection Agency (EPA) has completed the first five-year review for the Fresno Sanitary Landfill Superfund Site (Site) in Fresno, California. EPA reviewed the measures taken by the City of Fresno (City) to protect human health and the environment from contamination at the Site. The City, the California Department of Toxic Substances Control, and the California Regional Water Quality Control Board participated in the review. Words that appear in **bold** type are defined in the glossary on page 4.

This fact sheet summarizes the results of EPA's five-year review. You can review EPA's complete *Five-Year Review Report for the Fresno Sanitary Landfill* (September 2005), which officially documents EPA's findings, at the Site information repositories or on EPA's website (refer to page 5 for specific details). EPA will review the cleanup for this Site every five years as long as contamination remains. The next five-year review is scheduled for 2010.

### Results of Review

The **groundwater** and landfill cleanup systems (or remedies) and measures taken by the City are designed to keep the public from coming into contact with contamination at the Site. EPA needs more information, however, to confirm that the cleanup remedies will protect human health and the environment in the long-term. EPA identified seven issues and recommendations, summarized below, which describe specific actions for the City to complete to ensure adequate protection. EPA estimates that the recommended actions will be completed by 2007.

### Site Cleanup Goals and Treatment Systems

The contaminants in groundwater and landfill gases at the Site are **volatile organic compounds (VOCs)**. VOCs are chemicals that evaporate into the air easily and are commonly used in dry cleaning, paint stripping, and machinery degreasing. The Site cleanup goals include:

- **Preventing** contaminated groundwater from moving away from the Site;
- **Cleaning up** contaminated groundwater to meet federal and state standards;
- **Containing** landfill wastes onsite; and
- **Capturing and treating** gases emitted from the landfill to prevent releases into the atmosphere.

To manage the cleanup, EPA divided the Site into two separate **operable units (OUs)**. Operable Unit 1 (OU-1) includes a landfill cover, a landfill gas collection system, a landfill gas flare, and a surface water management system. The components of OU-1 stop infiltration of rainwater into the landfill waste and collect landfill gases that would otherwise be released into the atmosphere. Operable Unit 2 (OU-2) includes a groundwater extraction and treatment system and a groundwater monitoring well network. The monitoring well network measures contaminants, where present, and is used to evaluate the effectiveness of the groundwater treatment system. Refer to page 4 for more information on the Site background.



Area map

## Five-Year Review: Issues and Recommendations

The summary below explains the seven issues and recommendations resulting from EPA's five-year review. Many of the technical terms used in the five-year review report are simplified to help make the information easier to understand.

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**1 NEW WELLS AND LANDFILL USES:** Protective measures known as **institutional controls** (ICs) are needed to keep the cleanup remedies protective now and in the future. The goals of ICs for this Site include:

- **Protecting public health** by prohibiting installation of new drinking water wells in the contaminated groundwater **aquifer** near the Site.
- **Keeping the groundwater remedy working** properly by prohibiting the installation of new wells near groundwater extraction wells.
- **Protecting public health** by prohibiting the building of homes on the landfill footprint.
- **Protecting the landfill cap** by prohibiting any activity that could puncture the top of the landfill.

**Recommendation:** Prepare an **Explanation of Significant Differences** (ESD) document for the Site to identify the specific ICs needed. An ESD slightly changes the original selected cleanup in a **Record of Decision** (ROD) but does not affect the scope, performance or cost of the cleanup. ESDs and RODs are legal documents drafted by EPA to record cleanup decisions and required cleanup actions.

An ESD for this Site will require a legal agreement associated with the property deed for the landfill to prohibit residential land use and groundwater use. The ESD also will update the landfill maintenance requirements cited in the original ROD. EPA will publish a notice in the newspaper to let the public know when the ESD is complete, and place copies of the ESD in the Site information repositories.

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**2 LANDFILL GAS FLARE PERFORMANCE:** The City tests the landfill gas flare to ensure landfill gases are destroyed. The flare came close to passing the first test in Spring 2004 and the City adjusted the system to improve performance. The City is reviewing results from a second test performed in April 2005.

**Recommendation:** Assess and, if necessary, improve the performance of the landfill gas flare by:

- Completing the review of results from the second test;
- Working with EPA to reach an agreement on any changes to the system; and
- Modifying operations of the flare system if necessary.

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**3 LANDFILL GAS FLARE OPERATIONS:** The potential for **dioxins** to form during combustion of gases by the landfill gas flare has led EPA to request that the City confirm the flare is operating safely.

**Recommendation:** Confirm the safety of the flare by:

- Using a computer model to estimate possible dioxin releases; and
- Testing dioxin levels at the flare stack if safety questions remain.

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**4 ECOLOGICAL RISK ASSESSMENT:** An **Ecological Risk Assessment** (ERA) must be completed at the Site to determine if critical habitat exists or if endangered species live in the area around the landfill. The ERA will evaluate whether any endangered species are adversely impacted by the remedial actions.

**Recommendation:** Perform an ERA to determine if critical habitat exists or if endangered species live in the area around the Site.

(Continued on page 3)

## Five-Year Review: Issues and Recommendations, cont'd.

**5 LANDFILL GAS MONITORING:** EPA found debris and water in some of the concrete vault boxes that house the gas monitoring wellheads in the landfill. Elevated methane gas levels measured in one location at the landfill may indicate a need to increase landfill gas monitoring.

**Recommendation:** Clean the landfill gas monitoring well vault boxes, adequately secure the vault box lids, and regularly check methane levels. If methane levels remain a concern, place a monitoring well near the property line along Jensen Avenue to confirm that landfill gases are contained.

**6 DOWNWARD CONTAMINANT FLOW IN GROUNDWATER:** VOCs in groundwater are moving downward from the shallower groundwater aquifers to the deeper groundwater aquifer. The deeper groundwater aquifer is 200 to 240 feet below the ground.

**Recommendation:** Continue to measure VOCs in groundwater moving between the shallow and deep aquifers. In addition:

- Use a computer model to evaluate possible ways to stop VOCs from contaminating the deep aquifer; and
- Consider the results of the computer modeling while assessing the effectiveness of the groundwater remedy.

(Note: In 2004, the City of Fresno destroyed three agricultural wells at the Site that previously had caused much of the movement of VOCs from the shallow aquifers to the deep aquifer.)

**7 GROUNDWATER EXTRACTION EFFECTIVENESS:** Reduced regional groundwater levels have resulted in lower groundwater flow into extraction wells. As a result, the groundwater remedy is less effective than expected and the plume of groundwater contamination may spread. Flow meters currently installed in the groundwater extraction wells cannot accurately measure the low flow rates.

**Recommendation:** Replace flow meters and evaluate system operations. In checking system effectiveness, consider current groundwater levels and extraction rates.

### City of Fresno Increases Groundwater Treatment

The City of Fresno continually looks for more effective ways to operate the groundwater and landfill cleanup systems. Better system operations result in faster cleanup. One way to speed cleanup is by reducing the amount of time cleanup systems spend off-line for routine maintenance and repair. Under ideal conditions, the systems would operate non-stop. In working to achieve that goal, the City has found a safe way to continue running the groundwater treatment plant while performing maintenance on the landfill gas flare.

During regular operations, VOCs are stripped from groundwater by the treatment plant, carried in a gas exhaust stream (or "off-gas") and destroyed by the landfill gas flare. As a safety precaution, the treatment plant shuts down when the flare shuts down.

Recently, the City found that stopping the whole system during maintenance or repair is an overly cautious safety measure. The off-gas leaving the groundwater treatment plant contains only small amounts of VOCs. As a result, unhooking the exhaust stream from the flare and venting the off-gas temporarily to the atmosphere is safe. The state agency responsible for local air quality (San Joaquin Valley Unified Air Pollution Control District) verified the safety of off-gas releases using a health risk screening analysis. EPA agrees with the state agency's results. To maximize groundwater cleanup, the City will continue to operate the treatment plant during routine maintenance of the flare. The City will limit these operations to a maximum of 14 days per calendar year.

**Administrative Record (AR):** A complete body of documents that forms the basis for U.S. EPA's selection of the preferred cleanup remedy.

**Aquifer:** An underground layer of soil, sand, gravel or rock that can store and supply groundwater to wells and springs.

**Dioxins:** Dioxins are a family of chemicals containing carbon, hydrogen and chlorine. They can form as a byproduct during combustion. Adverse health effects from exposure to dioxins are currently under study.

**Ecological Risk Assessment (ERA):** A study to determine if: a) habitat critical to local plant and animal species exists in the area; b) any endangered species live in the area; and c) any adverse effects on the critical habitat or the endangered species are resulting from the remedial actions.

**Explanation of Significant Differences (ESD):** A document explaining changes to the cleanup actions originally selected in a Record of Decision (ROD).

**Groundwater:** Water found beneath the earth's surface that fills pores in soil, sand, and gravel or cracks in bedrock.

**Institutional controls:** Measures used to keep cleanup remedies protective, now and in the future.

**Operable unit (OU):** An individual action or a combination of actions targeted to a specific area or set of conditions to address contamination at a site.

**Remedy:** An approach for cleaning up contamination at a site that may involve a combination of cleanup technologies and administrative controls (i.e., institutional controls).

**Record of Decision (ROD):** A document explaining the cleanup actions that will be implemented at a contaminated site.

**Volatile organic compound (VOC):** A carbon-containing chemical compound that evaporates (volatilizes) readily at room temperature.

The Fresno Sanitary Landfill is located four miles southwest of the City of Fresno in Fresno County, California. The landfill covers 145 acres and rises 60 feet above the surrounding lands. West Avenue (between North and Jensen Avenues) borders the landfill and agricultural land surrounds the landfill. The City disposed waste into the landfill between 1937 and 1989 and remains the landfill owner.

Because the bottom of the landfill is unlined, wastes in the landfill contaminated underlying soil and groundwater. Landfill gases also contaminated the air. In 1993, EPA signed a Record of Decision (ROD) to enact measures to control methane gas and waste movement underneath the landfill. The landfill cleanup action, referred to as Operable Unit 1 (OU-1), included constructing a landfill cover system, a landfill gas control system, and a surface water management system. The landfill cleanup systems were built in 2001, along with a neighboring regional sports park.

In 1996, EPA signed a ROD for the groundwater cleanup, referred to as Operable Unit 2 (OU-2). The ROD calls for implementing the remedy in three phases. Phase 1 involves containing the contaminated groundwater underneath the landfill using extraction wells along the landfill perimeter. The City started groundwater cleanup measures in 1999, and then began operating the Phase 1 treatment system in 2001.

EPA and the City are reviewing the effectiveness of the Phase 1 groundwater treatment system. Based on this review, the City may need to modify the existing Phase 1 system or start the second phase (Phase 2) of groundwater remediation. If implemented, Phase 2 will prevent further spreading of groundwater contamination into clean portions of the aquifer. The third and final phase of groundwater cleanup, if necessary after the objectives of Phases 1 and 2 are met, will focus on treating contamination in groundwater to meet drinking water standards. EPA must approve all groundwater cleanup actions.

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EPA maintains the Site's **Administrative Record** file at the two information repositories listed below. The Information Repository includes the project reports, fact sheets and other reference materials.

**Fresno County Central Library**

2420 Mariposa Street  
 Fresno, CA 93721  
 (559) 488-3195, option 5



**Superfund Records Center**

95 Hawthorne Street  
 San Francisco, CA 94105  
 (415) 536-2000

**EPA's website** is located at <http://www.epa.gov/region09/waste/sfund/superfundsites.html> Once you are at the website, scroll down the page and click on the blue highlighted title called "Site Overviews."



**IS MY WATER SAFE TO DRINK?**



"The City's water supply is strictly regulated by state and federal government standards — among the most protective in the world — and our water supply meets all standards. Fresno's water treatment systems are viewed as models of good treatment throughout California. Contact the City of Fresno Water Division at (559) 621-5300." (Cited from the City of Fresno Water Department web page at [www.fresno.gov/public\\_utilities/water/water\\_faq.asp](http://www.fresno.gov/public_utilities/water/water_faq.asp))

# EPA Completes Five-Year Review of Cleanup at Fresno Sanitary Landfill Site

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