



# FACT SHEET

## Installation Restoration Program Sites 18 and 24 Groundwater Cleanup Former Marine Corps Air Station El Toro August 2008



### INTRODUCTION

The purpose of this Fact Sheet is to provide the community with an update of groundwater cleanup activities at former Marine Corps Air Station (MCAS) El Toro Installation Restoration Program (IRP) Site 18, the **Principal Aquifer (PA)** and IRP Site 24, the **Shallow Groundwater Unit (SGU)**. Two previous Fact Sheets, issued in June 2005 and February 2006, provided information regarding these two sites including initial construction activities.

### GROUNDWATER CLEANUP PROGRESS

The groundwater cleanup system, which is managed by the Navy, has been operational at IRP Sites 18 and 24 since October 2006 (see location map on page 3). One component of this system includes 39 extraction wells installed in the SGU on former MCAS El Toro property (the former Station); the total flow rate from these wells is approximately 400 gallons per minute. Another component of the groundwater cleanup system includes 3 extraction wells installed in the PA located west of the former Station property; the total flow rate from these wells is approximately 2,900 gallons per minute (see Geologic Setting on page 2 for an explanation of the differences in flow rates). Groundwater extracted from the SGU and the PA is treated at two separate treatment plants using air strippers and activated carbon filters to remove **volatile organic compounds (VOCs)**, including **trichloroethene (TCE)**, with a portion of the clean treated water being pumped to an ocean outfall and the remainder used for irrigation purposes. A comprehensive performance monitoring program for IRP Sites 18 and 24 is also in-place which includes computerized monitoring of pumping rates and water levels, monthly sampling of extraction wells, and quarterly monitoring of 98 other sampling locations associated with Sites 18 and 24.



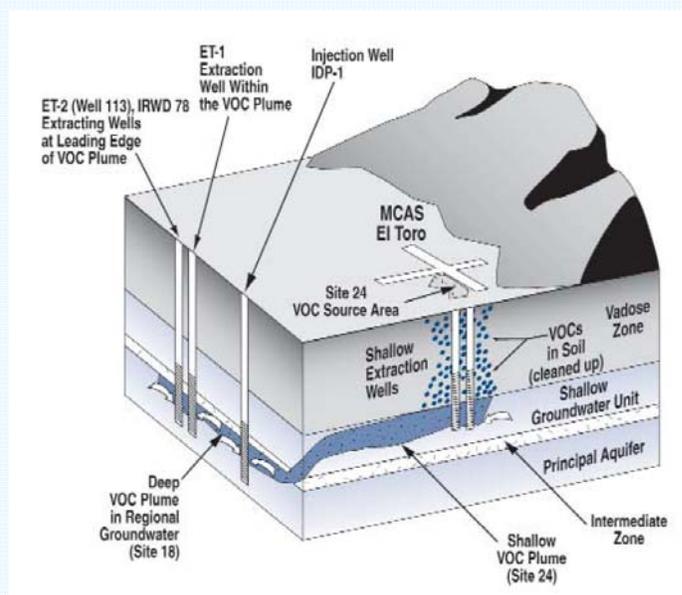
Status reports on the performance of the groundwater cleanup system are provided annually to the U.S. Environmental Protection Agency (U.S. EPA), California Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board, Santa Ana Region (RWQCB), Orange County Water District (OCWD), and Irvine Ranch Water District (IRWD). Comprehensive evaluations of the groundwater cleanup system will also be performed every 5 years to ensure it remains effective and protective of human health and the environment. Evaluation results are presented in 5-Year Review Reports, which are made available for public review and comment; the first 5-Year Review Report is scheduled for September 2009 (based on a construction start date for the cleanup system of September 2004).

## SITE DESCRIPTION

Sites 18 and 24 are closely associated, as Site 24 has been identified as the source of VOCs, primarily TCE, in groundwater at Site 18; although the precise origin, nature, use, and quantities of TCE released at Site 24 are not documented. Maintenance activities (e.g., aircraft washing, degreasing) conducted adjacent to and within buildings located at Site 24 are believed to be the source of VOC contamination. VOC-impacted groundwater (at concentrations exceeding cleanup goals) originates in the SGU at Site 24, migrates into the PA adjacent to the southwestern boundary of the former Station, and extends into the PA off of the former Station, approximately 3 miles northwest toward Culver Drive in Irvine. TCE is not present in the deeper PA below the former Station at concentrations that exceed cleanup goals due to the presence of a thick sequence of clay called the Intermediate Zone, which acts as an effective barrier to downward vertical movement of groundwater and VOCs from the SGU into the deeper PA (see cross-section below and the map on Page 3).

**GEOLOGIC SETTING:** The SGU under Site 24 consists of clay, silt, and sand layers from the surface to a depth of about 250 feet. Beneath the SGU, a 70- to 140-foot-thick clay interval named the Intermediate Zone, separates the SGU from the PA. The Intermediate Zone acts as an effective barrier to downward vertical movement of groundwater and VOCs from the SGU to the PA. The underlying PA consists of layers of sand and gravel, typically deeper than about 300 feet below the surface.

Wells screened in the shallow SGU do not produce high volumes of water, typically 10 gallons per minute, because water does not move easily through less permeable layers of clay and silt. Wells screened in the deeper PA produce high volumes of water, typically a few hundred to a thousand gallons per minute or more, as water moves more easily through more permeable layers of sand and gravel.



**WATER SUPPLY AT FORMER MCAS EL TORO:** During construction of former MCAS El Toro in 1942, six water supply wells were installed to total depths ranging from 440 to 645 feet below ground surface on the former Station property (see map on Page 3 for approximate location of former water supply wells). Monthly pumping records available from May 1943 to December 1950 indicate the maximum combined flow from these six wells was 900 gallons per minute in August 1945. These completion depths and pumping rates are consistent with current and historic water supply and irrigation wells installed in the PA in the greater Irvine Subbasin.

In the early 1950s, the Navy began construction of an 18-inch water supply pipeline from the western boundary of the former Station to a Metropolitan Water District (MWD) of Southern California feeder line located at Warner Avenue and Bristol Street. A contract for service of water between MWD and the Navy was executed in February 1951 and MWD subsequently began supplying water to the former Station (as well as former MCAS Tustin). In July 1969, the Navy signed a water supply service agreement with IRWD. The Navy also transferred title of the 18-inch pipeline to IRWD, who continues to supply water for use at the former Station.

**THE GROUNDWATER REMEDY:** The groundwater cleanup remedy was developed by the Navy in conjunction with the OCWD and the IRWD, and was integrated into a recycled water supply project named the Irvine Desalter Project. Based on an agreement between the Navy, U.S. Department of Justice, OCWD, and IRWD; VOC-impacted groundwater extracted from the Site 24 SGU on former Station property is treated by the OCWD. The OCWD and IRWD extract and treat VOC-impacted groundwater from the PA located off the former Station property. The intended reuse of the clean treated water is for non-potable (not-for-drinking) applications. The agreement was incorporated into the Navy's Record of Decision (ROD) for Sites 18 and 24, which was finalized in 2002, and concurred upon by the U.S. EPA, DTSC, and the RWQCB.

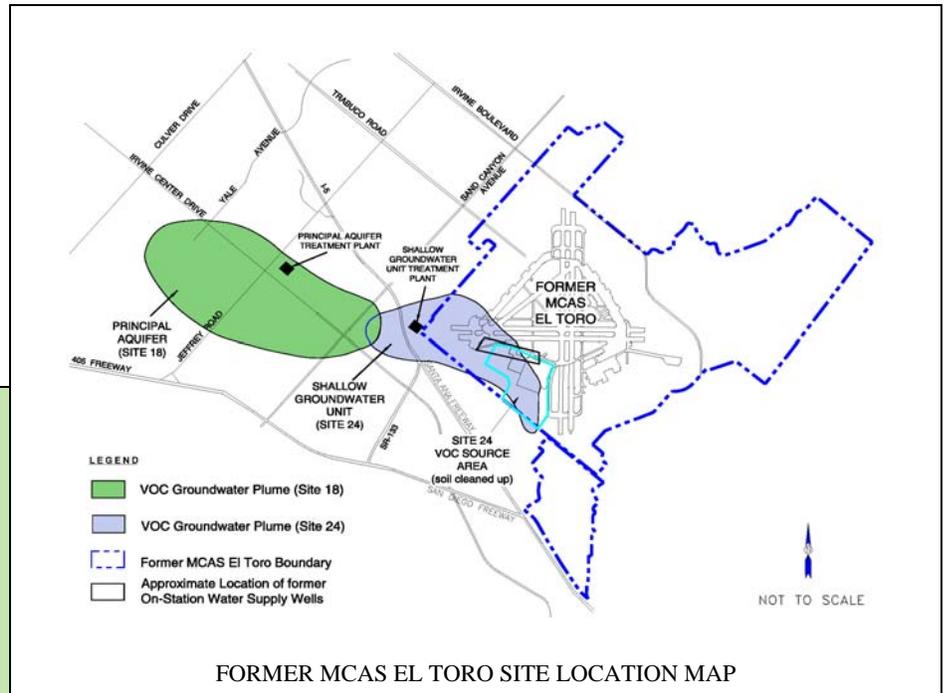
# REMEDIAL ACTION OBJECTIVES FOR GROUNDWATER

Remedial action objectives guided the development of cleanup actions being taken for groundwater. In general, they are to reduce VOC concentrations to federal or state cleanup standards, prevent further vertical and lateral migration of the plumes, and prevent the use of VOC-impacted groundwater. Numeric cleanup goals for VOCs in groundwater are designed to be protective of human health and the environment. The cleanup goal for TCE is 5 micrograms per liter, or 5 parts per billion in groundwater. A human-health risk assessment conducted in 2004 concluded that potential indoor migration of VOC vapors from groundwater would not pose unacceptable risk based on the fact that groundwater is first encountered at about 100 feet below the ground surface.

## INSTALLATION RESTORATION PROGRAM AND COMMUNITY INVOLVEMENT:

Since the late-1980s, numerous investigations have been conducted at former MCAS El Toro under the Navy's IRP. The IRP is a comprehensive environmental investigation and cleanup program that identifies, investigates, and remediates contaminated media, including soil and groundwater. The IRP complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other federal and state laws that govern environmental investigations and cleanups. Activities performed under the IRP, including selection of the final remedies documented in RODs, are reviewed and concurred upon by the U.S. EPA, DTSC, and the RWQCB.

In addition to multi-agency involvement, CERCLA includes a significant public participation component. The Navy encourages the public to gain an understanding of the on-going environmental investigations and cleanups at former MCAS El Toro by visiting the information repository, reviewing the relevant records contained in the Administrative Record file, and attending Restoration Advisory Board (RAB) meetings. RAB meetings are held quarterly, typically on the third Wednesday of the month in Orange County. If you would like to be put on the mailing list to receive information about environmental restoration activities at former MCAS El Toro, please contact Ms. Randa Chichakli, CDM, 9444 Farnham Street, Suite 210, San Diego, CA 92123, (858) 268-3383. If you prefer, you can email your request to [chichaklire@cdm.com](mailto:chichaklire@cdm.com).



## PROJECT CONTACTS

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**INSIDE...**

**Groundwater Cleanup Update for Installation  
Restoration Program Sites 18 and 24  
Former Marine Corps Air Station El Toro**



***For More Information:***

Documents that detail the cleanup of groundwater at Sites 18 and 24 are available at the following locations:

Heritage Park Regional Library  
MCAS El Toro Information Repository  
14361 Yale Avenue  
Irvine, CA 92604  
(949) 936-4040

MCAS El Toro Administrative Record File  
BRAC Office Building 307  
Former MCAS El Toro  
Ms. Marge Flesch  
(949) 726-5398

**Internet Connection**

For more information on former MCAS El Toro environmental restoration activities, visit the web site at: [www.bracpmo.navy.mil](http://www.bracpmo.navy.mil)

Base Realignment and Closure  
Attn: Mr. Anthony Megliola  
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7040 Trabuco Road  
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