

Fort Ord Drinking Water Quality

Drinking water sources are protected from contaminated groundwater by institutional and engineering controls. Institutional controls include deed restrictions, California State Land Use Covenants, Marina Municipal Code, and Monterey County Code, which prohibits construction of water wells within the Prohibition Zone. Engineering controls are the groundwater treatment systems (Figure 5).

The Marina Coast Water District (MCWD) supplies drinking water to the City of Marina and former Fort Ord. Drinking water supplied by MCWD meets all Federal, State, and local regulatory standards. Drinking water quality is regularly tested by MCWD and results are reported in an annual Consumer Confidence Report (CCR) found at: www.mcwd.org/gsa_ccr.html.

TCE concentrations in drinking water supply wells are at very low levels and are not expected to increase. Groundwater modeling indicates concentrations will remain below drinking water MCLs. Monitoring wells up-gradient of the supply wells show stable or declining concentration trends. **Fort Ord drinking water is safe and protected from contamination plumes.**

Frequently Asked Questions

Is the water safe to drink? Yes. The MCWD regularly monitors drinking water. These results are reported to the California State Water Resources Control Board, Division of Drinking Water, and the water quality results are published for the public to see on the MCWD website www.mcwd.org/gsa_ccr.html. In addition, the Army also routinely monitors several Ord Community drinking water supply wells used by the MCWD and the results are reported to the regulatory agencies EPA, RWQCB, and DTSC.

Is there contamination in groundwater from former Fort Ord activities? Yes. There is groundwater contamination at three sites. Cleanup is complete at a fourth site, Operable Unit 1.

Does the contamination affect drinking water supplies? Yes. The Army and the MCWD detected very low concentrations of TCE in some water supply wells located in the Ord Community. The concentration detected is above the detection limit but well below the MCL. The drinking water meets all federal and state drinking water standards.

What has the Army done to clean up groundwater contamination? The Army has removed or treated the sources of the contamination and installed water treatment facilities at all known groundwater contamination sites. The U.S. Environmental Protection Agency (USEPA), the California Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB) oversee groundwater cleanup programs at the former Fort Ord.

How long will it be before the groundwater cleanup is complete? The Army will continue to treat known contaminated groundwater sites until COCs are at or below ACLs. Due to the amount of water that must be pumped and treated, the concentrations of contaminants decline slowly over time. OU1 has met its ACLs and cleanup is complete. Sites 2/12 is expected to meet ACLs in the next few years. Removal of sufficient contamination to meet ACLs at OUCTP could take up to 20 years and for OU2 it could take up to 30 years, but this will likely be shortened with the operation of the new extraction wells and groundwater treatment plant.

Per- and Polyfluoroalkyl Substances (PFAS)

In 2020, the Army conducted a review of historical activities at the former Fort Ord to determine whether a release of PFAS may have occurred and to identify potential sources and types of release. The results are summarized in the Technical Summary Report for PFAS (Document Number: OU2-722B). Extensive site-wide research and investigations, including interviews with site personnel, were conducted during the development of this report, which was reviewed by USEPA, the California Department of Toxic Substances Control (DTSC), and the Central Coast Regional Water Quality Control Board (CCRWQCB). The report indicates there was limited historical use of PFAS-containing material at the former Fort Ord. In 2021, an additional evaluation was conducted in the form of Preliminary Assessment (PA). The Army gathered historical and other available information about site conditions where it was suspected or known that PFAS containing materials were used, stored, or disposed. The Preliminary Assessment Narrative Report was issued on September 15, 2022 (Document Number: BW-2904B). Based on the results of the PA, the Army conducted a Site Inspection for PFAS in 2023, which included soil and groundwater sampling to confirm whether or not a release of PFAS occurred at specific sites recommended for additional investigation in the Preliminary Assessment Narrative Report. The Site Inspection Narrative Report was issued on December 14, 2023 (Document Number: BW-2942A). **Next Step:** The Army is currently working with the regulatory agencies to plan for the Remedial Investigation Phase.

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Fort Ord Groundwater Cleanup Overview

Contents:

Groundwater Definitions	1
Conceptual Site Model	1
Groundwater Monitoring	2
Groundwater Contamination and Treatment	3
Drinking Water Quality	4
FAQs	4
Contact Information	4

Groundwater Definitions

Groundwater— All water under the ground, not water on the surface (for example rivers and lakes).

Aquifer—A body of rock or soil that is sufficiently permeable for groundwater to flow and serve as a water source.

Water Table—Depth below the ground surface at which groundwater is found.

Aquitard—A body of less permeable rock or soil between aquifers that retards the flow of water between the aquifers.

COCs—Chemicals Of Concern (present in groundwater).

GAC—Granular activated carbon is an effective adsorbent used in groundwater treatment. It is very porous and has a large surface area to which contaminants may adsorb.

MCL—Maximum Contaminant Level, the maximum allowable concentration of a chemical in drinking water.

ACL—Aquifer Cleanup Level, the cleanup goal for a COC in groundwater identified in a Record of Decision (typically the same as the MCL or lower).

Plume—Area of aquifer in which COCs are present at concentrations greater than the ACL.

OU—Operable Unit, discrete portion of remedial response that manages migration, or eliminates or mitigates a pathway of exposure.

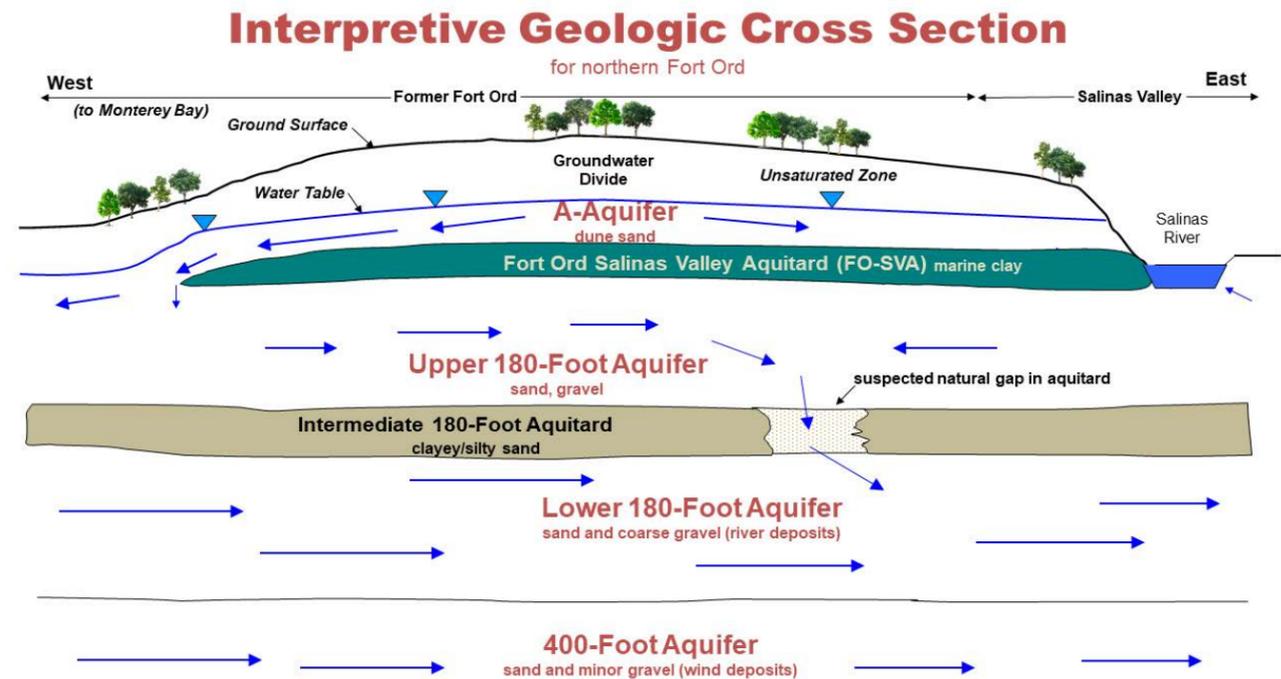
TCE—Trichloroethene, primary COC at OU1, OU2, and 2/12.

CT—Carbon tetrachloride, primary COC at OUCTP.

PCE—Tetrachloroethene, primary COC at 2/12.

Figure 1: The Conceptual Site Model (Figure 1 below) describes groundwater conditions beneath former Fort Ord. Four aquifers are underlying former Fort Ord: A-Aquifer, Upper 180-Foot Aquifer, Lower 180-Foot Aquifer, and the 400-Foot Aquifer. Aquitards bound the A-Aquifer, Upper 180-Foot Aquifer, Lower 180-Foot Aquifer, and 400-Foot Aquifer.

Groundwater flow in the A-Aquifer splits at a groundwater divide and goes toward the Salinas River and Monterey Bay, and enters the Upper 180-Foot Aquifer at the western edge of the FO-SVA. Groundwater may also be entering the Lower 180-Foot Aquifer through a suspected natural gap in the Intermediate 180-Foot aquitard.



Groundwater Monitoring

The Army and regulatory agencies have identified four areas on the former Fort Ord where chemical releases associated with past Army activities have contaminated groundwater. These four areas are identified as Operable Unit 1 (OU1), Operable Unit 2 (OU2), Sites 2 and 12 (2/12) and Operable Unit Carbon Tetrachloride Plume (OUCTP). Cleanup is complete at OU1.

- TCE is the main COC at OU2.
- PCE and TCE are the main COCs at Sites 2/12.
- CT is the main COC at OUCTP.

The Army has installed an extensive monitoring well network (Figure 2) to identify COC plume boundaries in the affected aquifers and determine flow rates and flow directions of the affected groundwater. As groundwater contamination is cleaned up, monitoring wells meeting the criteria shown in Figure 3 may be dropped from the monitoring program or decommissioned.

Figure 2 (Below): Monitoring well network in each of four contamination areas OU1, OU2, OUCTP, and Sites 2/12.

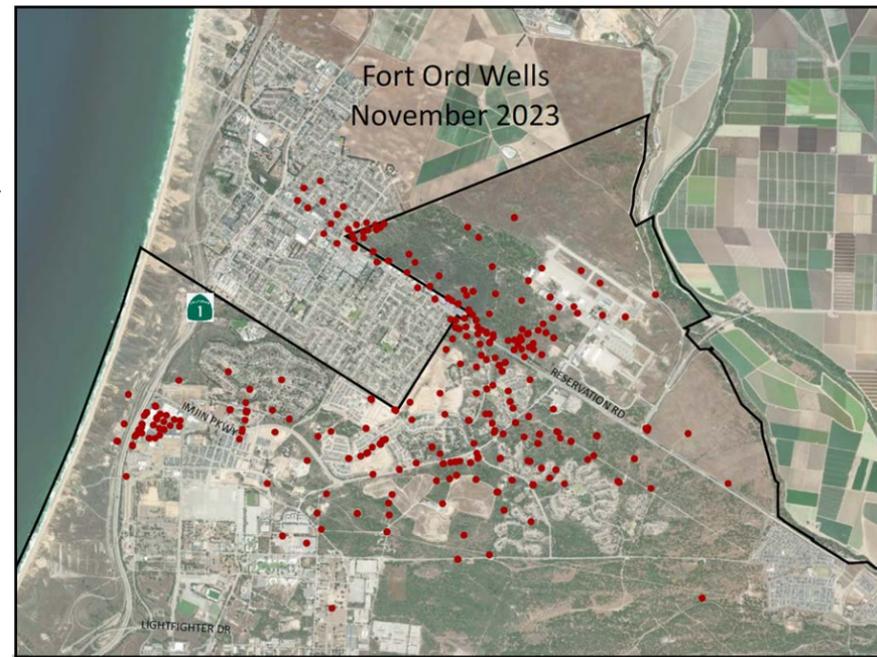


Figure 3 (Below): Monitoring well decision rules flow chart determining sampling frequency and possible well destruction.

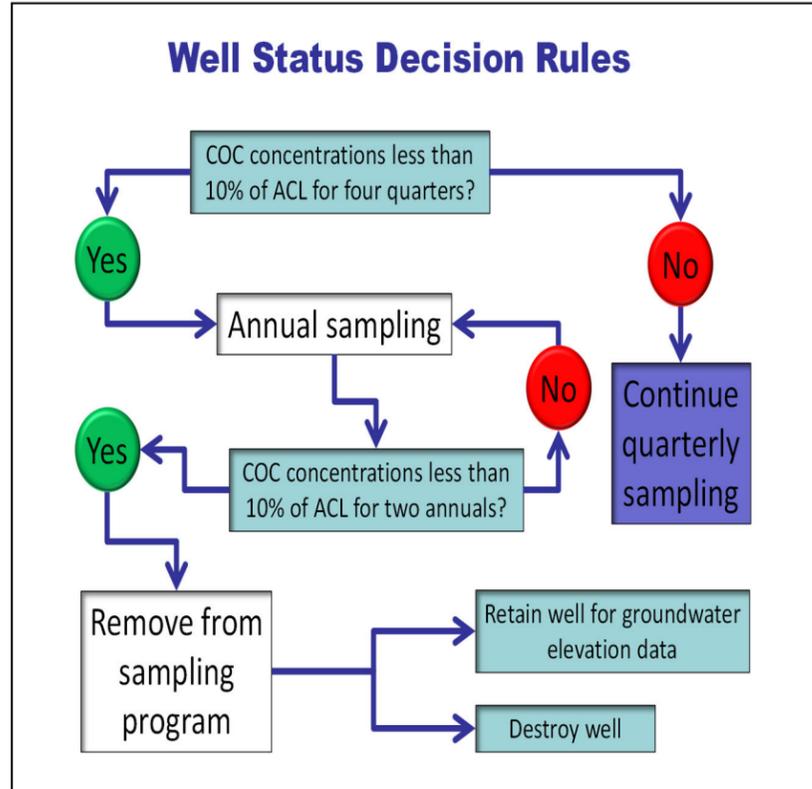
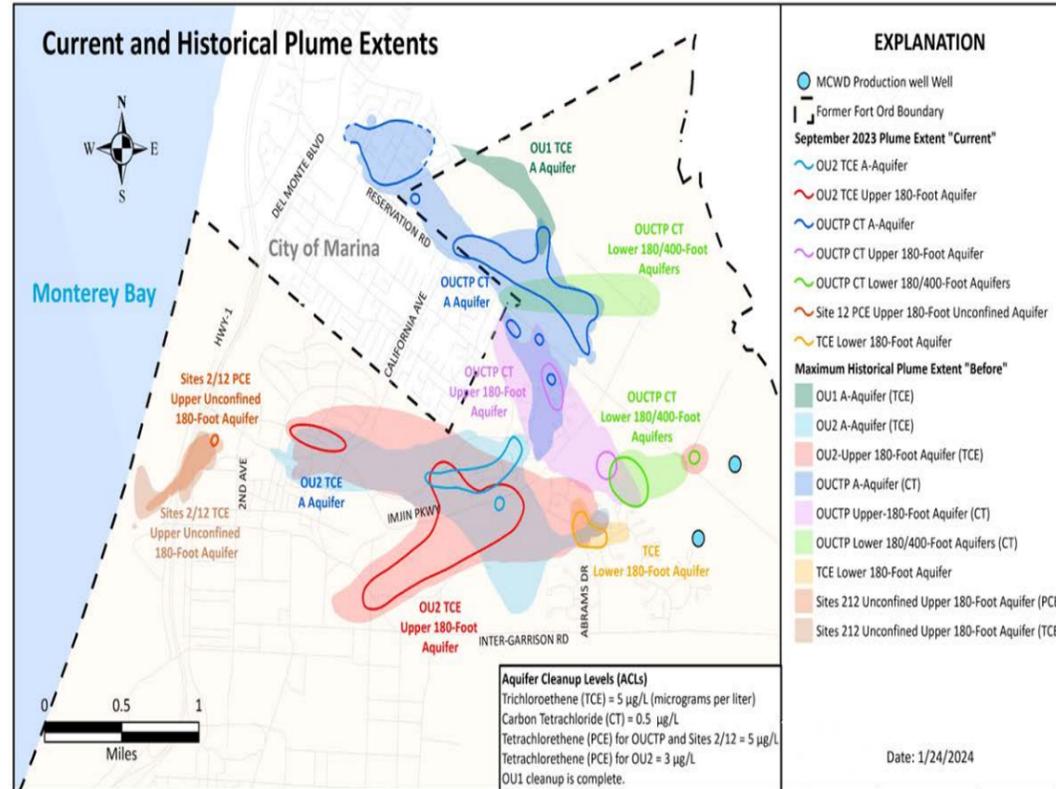


Figure 4 (Below): Shows the "before" and current outlines of the groundwater plumes.



Groundwater Contamination and Treatment

Two groundwater treatment systems pump contaminated groundwater from aquifers, remove contamination, and return treated groundwater to the aquifers. Groundwater cleanup will continue until COC concentrations are below the ACL. The four sites are described below.

OU1—Cleanup is complete. Groundwater at this site was contaminated by former fire-fighting training (ceased in 1985) in an area near the Marina Municipal Airport. The primary COC was TCE, an industrial solvent used for degreasing, dry cleaning, and cleaning of mechanical parts. Groundwater treatment began in 1989 and is complete—all cleanup standards have been met.

OU2—A landfill southwest of the intersection of Imjin Parkway and Abrams Road was a source of groundwater contamination. The Army stopped accepting waste in 1987. An impermeable cover placed over the landfill prevents rainwater from drain-

ing through the buried materials and carrying contamination to the groundwater. Gas extraction and treatment systems remove methane gas and COCs. Groundwater extraction and treatment with GAC for COCs in the A-Aquifer and the Upper 180-Foot Aquifer began in 1995 and is on-going. The plume has been significantly reduced in size since then. A new, operational treatment plant located closer to the plume is increasing cleanup efficiency.

Sites 2/12—This is a former maintenance facility where improperly disposed solvents caused groundwater contamination. It is located in the Dunes on Monterey Bay shopping center (south of Imjin Parkway and east of Highway 1). Contaminated soil was removed in the 1990s. PCE and TCE are primary COCs. Groundwater extraction and treatment with GAC began in 1999 and is on-going. Additional treatment by soil vapor extraction was used from 2015-2018 to enhance the groundwater remedy and shorten cleanup time.

The amount of groundwater contamination is just a small fraction of what it was before the cleanup began.

OUCTP—Groundwater located north of Imjin Parkway and Abrams Road and along Reservation Road was contaminated by improperly disposed solvents. CT is the primary COC and cleanup includes enhanced *in situ* bioremediation (A-Aquifer), groundwater extraction and treatment with GAC (Upper 180-Foot Aquifer), and monitored natural attenuation (with well-head treatment as a contingency measure) (Lower 180-Foot Aquifer). Remediation began in 2009 for the A-Aquifer and in 2011 for the Upper and Lower 180-Foot Aquifers. In 2017, additional enhanced *in situ* bioremediation occurred followed by long term performance monitoring in 2018.

Figure 5 (Below): Groundwater remediation by groundwater extraction and treatment with Granular Activated Carbon (GAC) is the engineering control applied at Operable Unit 2, the Upper 180-Foot Aquifer for Operable Unit Carbon Tetrachloride, and at Sites 2/12. Treatment systems are optimized to improve efficiency. Optimization includes reviewing sampling data, treatment technologies, and modeling pumping configurations.

