

Fort Ord Environmental Cleanup Annual Report

Fort Ord BRAC Office

August 2019



Biologist performing habitat monitoring.

THE FORT ORD CLEANUP PROGRAM

Fort Ord closed on September 30, 1994. It was one of the largest U.S. military bases ever closed. The closure left behind an area of land the size of San Francisco. It was also an opportunity to repurpose the land for civilian uses that the community envisioned.

The Army is responsible for environmental cleanup of the former Fort Ord. The goals of the environmental cleanup program are to:

1. Protect human health and the environment
2. Promote preservation, enhancement and restoration of habitat
3. Transfer property for land uses determined by the reuse plan

The Fort Ord Base Reuse Plan was developed by the Fort Ord Reuse Authority, with a Board of Directors representing local communities. Already the base is home to a university, a research center, portions of a local college, a National Monument, outlet stores, a veterans' cemetery, and a new joint Veterans Affairs and Department of Defense health care center.

The cleanup program is implemented under the oversight of the U.S. Environmental Protection Agency, California Department of Toxic Substances Control, and California Regional Water Quality Control Board.

Each year the Army publishes an annual report summarizing environmental cleanup accomplishments. The major elements of the cleanup program are summarized on the following pages.

HEADLINES

- **No prescribed burns scheduled for 2019**
- **As munitions cleanup proceeded in the northern portion of the Fort Ord National Monument, more trails were opened for recreational use**
- **A new groundwater treatment plant became operational in February 2019**
- **Maintenance of the landfill cover system continues and additional raptor perches and owl boxes were installed to control populations of burrowing rodents**
- **Habitat restoration and monitoring continues in areas disturbed by cleanup activities**
- **Over 500 people participated in various community outreach events including bus tours, open houses and nature walks in the last year**

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Munitions Cleanup

From 1917 until base closure in 1994, military units trained on the lands of the former Fort Ord. Types of military munitions used at Fort Ord included artillery projectiles, rockets, hand grenades, practice land mines, pyrotechnics, bombs, and demolition materials. After base closure, the Army identified areas where munitions could still remain, and began conducting investigations and removal of munitions from these areas. The results of these investigations and removal actions were then evaluated, and today, much of the former Fort Ord has been released for reuse as selected by the local community. Munitions cleanup is currently underway in the Impact Area Munitions Response Area and in the northern portion of the Fort Ord National Monument. Due to fiscal constraints, the Army will not conduct prescribed burns in 2019. Prescribed burns will be scheduled in future burn seasons.

Since 2008, the Army has been continually conducting the cleanup of the 6,500 acre Impact Area Munitions Response Area. Over the last year, cleanup was completed in Units 25 and 28. In some units where munitions cleanup has been conducted, prescribed burns are still required to enhance the habitat. The remaining munitions cleanup and completion of the prescribed burns in the Impact Area Munitions Response Area is expected to take another 8 to 10 years.

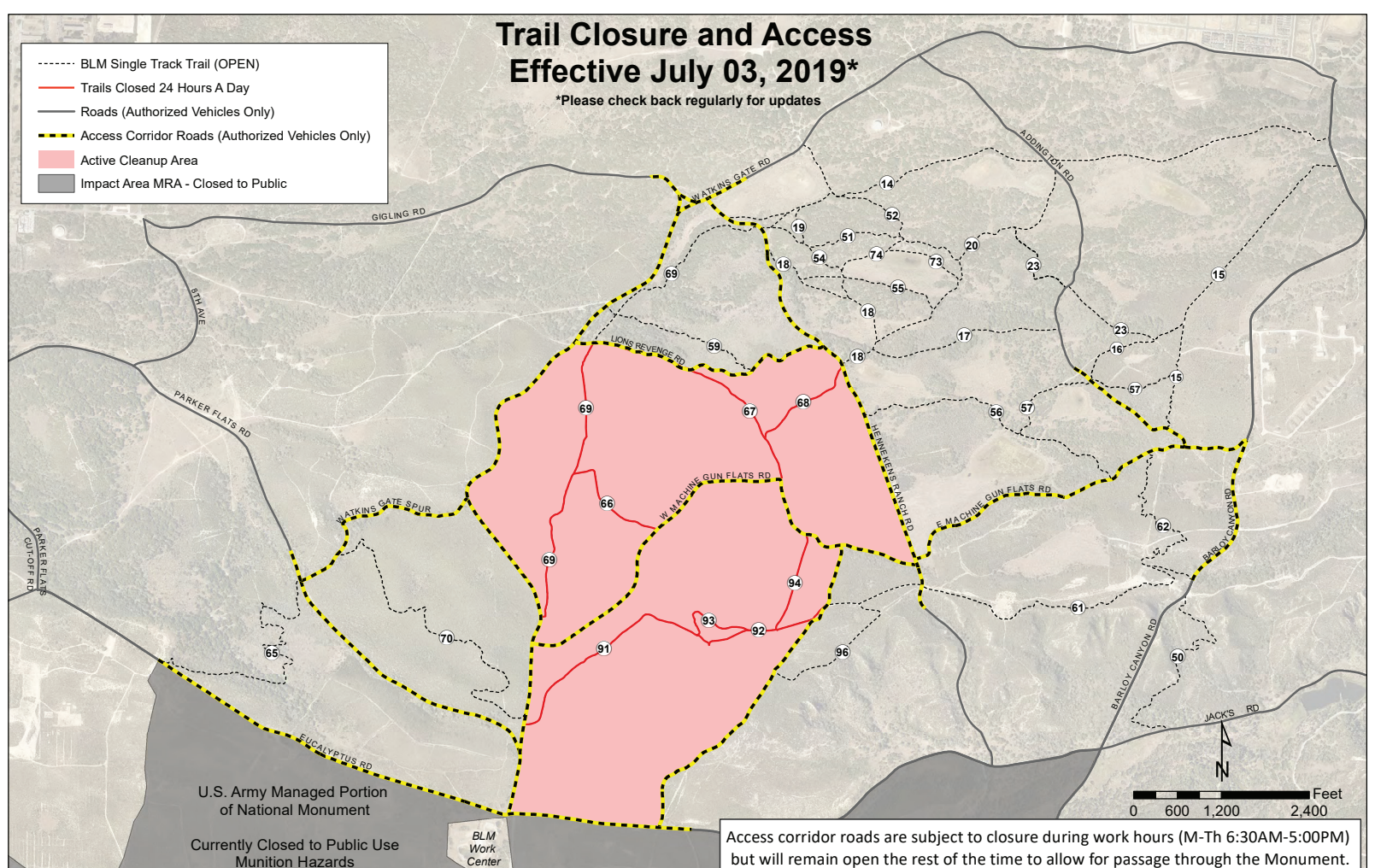
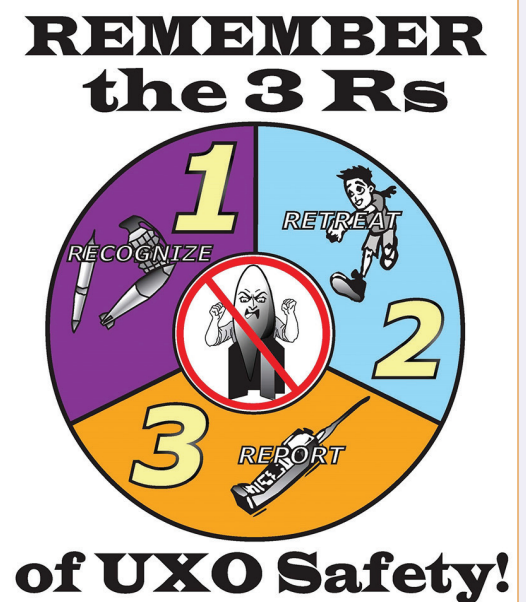
Munitions cleanup is also being conducted in the northern portion of the Fort Ord National Monument. The cleanup work supports the safe use of the Fort Ord National Monument for visitors, workers, and wildlife for years to come. This area includes land managed by the Bureau of Land Management for public recreation; however, trails and areas where munitions cleanup operations are occurring are temporarily closed. There is significant community

interest in completing the cleanup efficiently and quickly so the trails can be re-opened as soon as possible. This cleanup project began in May 2017 and, by summer 2019, several units have been completed and the trails were re-opened. The Army worked with the Bureau of Land Management to ensure the cleanup also supports several new trails. While most of the cleanup work has been completed and trails have re-opened, one location, called Unit A, has not yet benefited from a prescribed burn with follow-on munitions cleanup. Updated trail information is available at several information kiosks at frequently-used recreational access points, and on the Army's website www.fortordcleanup.com. Visitors who comply with posted restrictions and remain on designated trails are safe from munitions hazards. We ask that you Mind the Signs. For the latest information on cleanup and trail accessibility, go to the cleanup programs tab, then select the "BLM Area B" section of FortOrdCleanup.com.

The Army regularly provides munitions safety presentations to local schools; provides munitions recognition and safety training to workers conducting ground intrusive activities on the former Fort Ord; and maintains a site security program, working with neighboring municipalities and law enforcement agencies.

At the former Fort Ord, because of its history as a military base, it is possible that a military munition can be encountered. Should you suspect that you have encountered a munition, never approach, touch, move or disturb it. Even old munitions can detonate, causing severe injuries or death. If visiting the former Fort Ord, learn and follow the 3Rs of Explosives Safety.

- Recognize
- Retreat
- Report



Map above shows current access. Check the News section of FortOrdCleanup.com for updates.



Restoration in Historic Area 18 before (left) and after (right).

Habitat Management

The 27,827 acres of the former Fort Ord encompass a biologically diverse and unique region, which ranges from the sand dunes along the shores of Monterey Bay to the riparian forest of Toro Creek. The range and combination of climatic, topographic, and soil conditions at Fort Ord support several plant communities, with central maritime chaparral being the most extensive. Plants within this community are well adapted to periodic fires and poor soil conditions present on Fort Ord, and some of them occur only in the Monterey Bay area.

The diverse habitats on Fort Ord lands provide a setting for several species protected by the federal and state governments. Two annual plants, federally endangered and state threatened sand gilia and federally threatened Monterey spinyflower, thrive in areas with exposed sandy soils. The vernal pools on the former Fort Ord provide habitat for a federally endangered wildflower, Contra Costa goldfields, and the federally and state threatened California tiger salamander. Areas along the coast support the federally threatened western snowy plover (also listed as species of special concern in California) and the federally endangered Smith's blue butterfly – the first insect listed under the Endangered Species Act. Yadon's rein orchid, a federally endangered plant, and Seaside bird's-beak, a state endangered plant, also occur on the former Fort Ord.

Under the Endangered Species Act the Army is required to protect these species.

The Army works closely with the U.S. Fish and Wildlife Service to ensure that it conducts environmental cleanup activities in a

manner that minimizes impacts to the species and their habitat. In 1993, the U.S. Fish and Wildlife Service issued a Biological Opinion directing the Army to develop and implement an Installation-Wide Multispecies Habitat Management Plan for Fort Ord. The Habitat Management Plan was updated in 1997.

The general goal of the Habitat Management Plan is to “promote preservation, enhancement, and restoration of habitat and populations of Habitat Management Plan species while allowing development on selected properties that promotes economic recovery after closure of Fort Ord.” The Habitat Management Plan identified areas that could be developed with or without restrictions and areas set aside as habitat reserves or corridors with specific management guidelines to ensure the continued conservation of the rare, threatened, and endangered species and their habitats. About 16,200 acres of the former Fort Ord lands are designated as habitat reserve. Since the issuance of the Habitat Management Plan, the Army conducted formal consultations with the U.S. Fish and Wildlife Service which issued several Biological Opinions. Most recently, the Service issued a Programmatic Biological Opinion, which supersedes all previous Biological Opinions. The Habitat Management Plan and the Programmatic Biological Opinion outline management guidelines and specific conservation measures the Army must implement to minimize impacts on natural resources that may be affected during the environmental cleanup of the installation.

The Army monitors rare plant and animal species both before and after remediation activities, and uses the monitoring data

to assess whether the success criteria specified in the Habitat Management Plan, and the Programmatic Biological Opinion, have been met. The Army publishes annual reports of the monitoring results and presents them at an annual meeting to the regulatory agencies. The Army continues to consult with the U.S. Fish and Wildlife Service any time a new proposed action may affect listed species and was not addressed by the Habitat Management Plan or the Programmatic Biological Opinion.

The Army is working with the regulatory agencies to conduct soil cleanup where soil had been contaminated by lead bullets or other chemicals from munitions or explosives. Following soil cleanup activities, the Army is required to conduct restoration in the habitat reserve areas. To date, the Army has restored 27.9 acres of central maritime chaparral plant community. The Army is currently restoring 33.5 acres, and plans to restore an additional 0.5 acres. All restored sites are monitored to ensure plants are growing back successfully, as specified in the Habitat Restoration Plan. The results of the monitoring are shared with the regulatory agencies, and published in annual reports. If needed, adaptive management actions are discussed with the regulatory agencies and additional efforts are made to ensure the goals of restoration are met.

The photos above show Historic Area 18 that has been disturbed by soil cleanup activities. By 2013, the site was re-contoured and ready for habitat restoration activities. The next photo shows the same area five years later, with vegetative growth that occurred after restoration activities.

Groundwater Cleanup

When rain falls on the land, much of the water (especially when there is sandy soil like that found in the Monterey Bay area) seeps into the ground. The water continues down through the soil until it hits an underground layer of clay or rock and can go no further. Scientists call such an underground layer an aquitard. When the water can go no further it accumulates in the soil on top of the aquitard. Scientists refer to water stored in the ground in this way as groundwater and the soil where the groundwater is found as an aquifer. Water in an aquifer can flow through the soil, just like water flows in a river, only much slower.

In the northern portion of the former Fort Ord, there are four underlying aquifers that are of primary importance to the groundwater cleanup program, each separated by an aquitard. The upper-most, or shallowest, aquifer is called the A-Aquifer. The other deeper aquifers include the 180-Foot Aquifer which is split into the Upper and Lower 180-Foot Aquifers, and the 400-Foot Aquifer. These aquifers are named based on their depth below ground surface in the Salinas Valley in the east. The graphic below illustrates a cross section of aquifers on Fort Ord.

The **A-Aquifer** is the shallowest aquifer, between 60 feet and 100 feet deep, and is not used as a public water supply. The soil within the A-Aquifer is generally made up of sand or sandy soil from ancient sand dunes.

The **Upper 180-Foot Aquifer** has previously been used as a public water supply source, but does not currently supply drinking water to either the former Fort Ord or the City of Marina. The soil within this aquifer is made up of mainly sand with some gravel.

The **Lower 180-Foot Aquifer** and the **400-Foot Aquifer** are also made up of gravel and sand with some clay. Both are a major source of water for both the former Fort Ord and farms in the Salinas Valley.

There were a number of sources of contamination at the former Fort Ord, and as a result

there are a few different areas of groundwater contamination. See map on page 5.

The Army has completed treatment of contaminated groundwater in one area, the former site of the Fritzsche Army Airfield fire drill burn pit, known as Operable Unit 1. Groundwater treatment at this site began in 1989 and treatment is now complete – groundwater at this site meets all the cleanup standards.

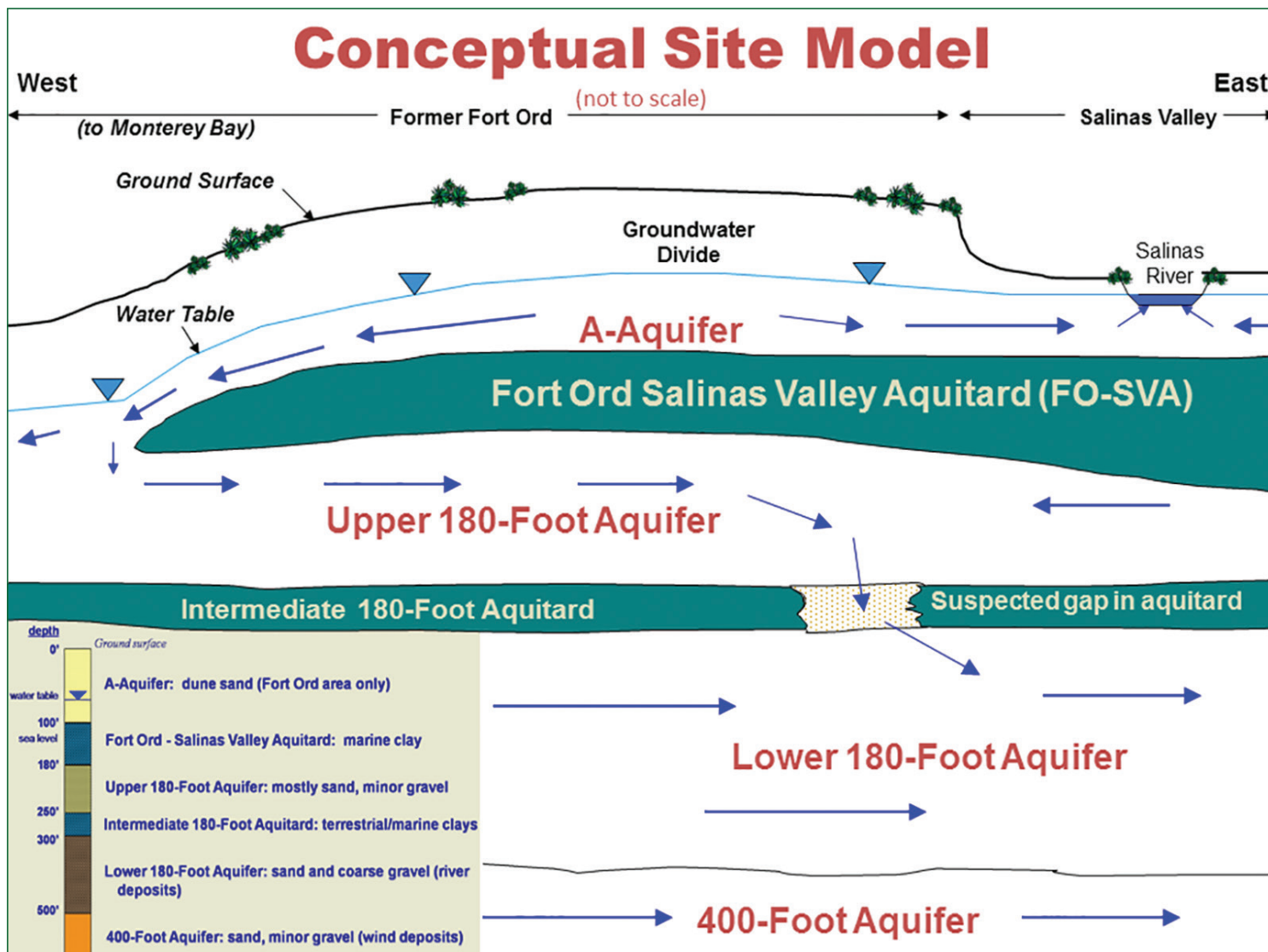
The Army continues to clean up three areas of groundwater contamination under the former Fort Ord: Operable Unit 2, Sites 2/12, and Operable Unit Carbon Tetrachloride. These groundwater plumes have reduced in size significantly since clean-up began.

Operable Unit 2 – A landfill southwest of the intersection of Imjin Parkway and Abrams Road was a source of groundwater contamination. The Army stopped accepting waste into the landfill in 1987. An impermeable cover placed over the landfill prevents rainwater from draining through the buried materials and carrying contamination to the groundwater. A gas extraction and treatment system removes methane gas and chemicals of concern from within the landfill. Groundwater extraction and treatment with granular activated carbon for chemicals of concern in the A-Aquifer and the Upper 180-Foot Aquifer began in 1995

and is on-going. The plume has reduced in size significantly since then, and a new groundwater treatment plant is increasing cleanup efficiency.

Sites 2/12 – This site is a former Army maintenance facility where improperly disposed of solvents caused groundwater contamination. The site is located in the current Dunes on Monterey Bay shopping center, south of Imjin Parkway and east of Highway 1. Contaminated soil was removed in the 1990s. Groundwater extraction and treatment with granular activated carbon began in 1999 and is on-going. Additional treatment by soil vapor extraction was used from 2015 to 2018 to enhance the groundwater cleanup and shorten the time for cleanup. The amount of groundwater contamination remaining at this site is just a small fraction of what it was before clean-up began.

Operable Unit Carbon Tetrachloride – Groundwater located north of Imjin Parkway and Abrams Road and along Reservation Road was contaminated by improperly disposed solvents. Carbon Tetrachloride is the primary chemical of concern and cleanup methods include enhanced *in situ* bioremediation (A-Aquifer), groundwater extraction and treatment with granular activated carbon (Upper 180-Foot Aquifer), and monitored



natural attenuation (with wellhead 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 and is on-going.

Groundwater from Operable Unit 2, Sites 2/12, and a portion of Operable Unit Carbon Tetrachloride (Upper 180-Foot Aquifer) are treated by pumping water from the ground with extraction wells, running the water through vessels containing granular activated carbon which removes contaminants, then returning the treated water to the ground using injection wells. Groundwater cleanup will continue until concentration(s) of chemicals of concern are below the federal and state Aquifer Cleanup Levels. The table above right shows the amount of contaminants removed as of December 2018.

A new, larger groundwater treatment plant for Operable Unit 2 became operational in February 2019. The new location is closer to the source of the groundwater

Groundwater Treatment as of December 2018	Operable Unit 2 / Operable Unit Carbon Tetrachloride*	Sites 2/12
Treatment Started	October 1995	April 1999
Gallons Treated	7.233 billion	2.001 billion
Pounds of contaminants removed	828	482
Gallons of contaminants removed	67	37
Aquifers Treated	A-Aquifer Upper 180-foot aquifer	Upper 180-foot aquifer

*The Operable Unit Carbon Tetrachloride remedy for the Upper 180-foot Aquifer is connected to the Operable Unit 2 groundwater treatment plant.

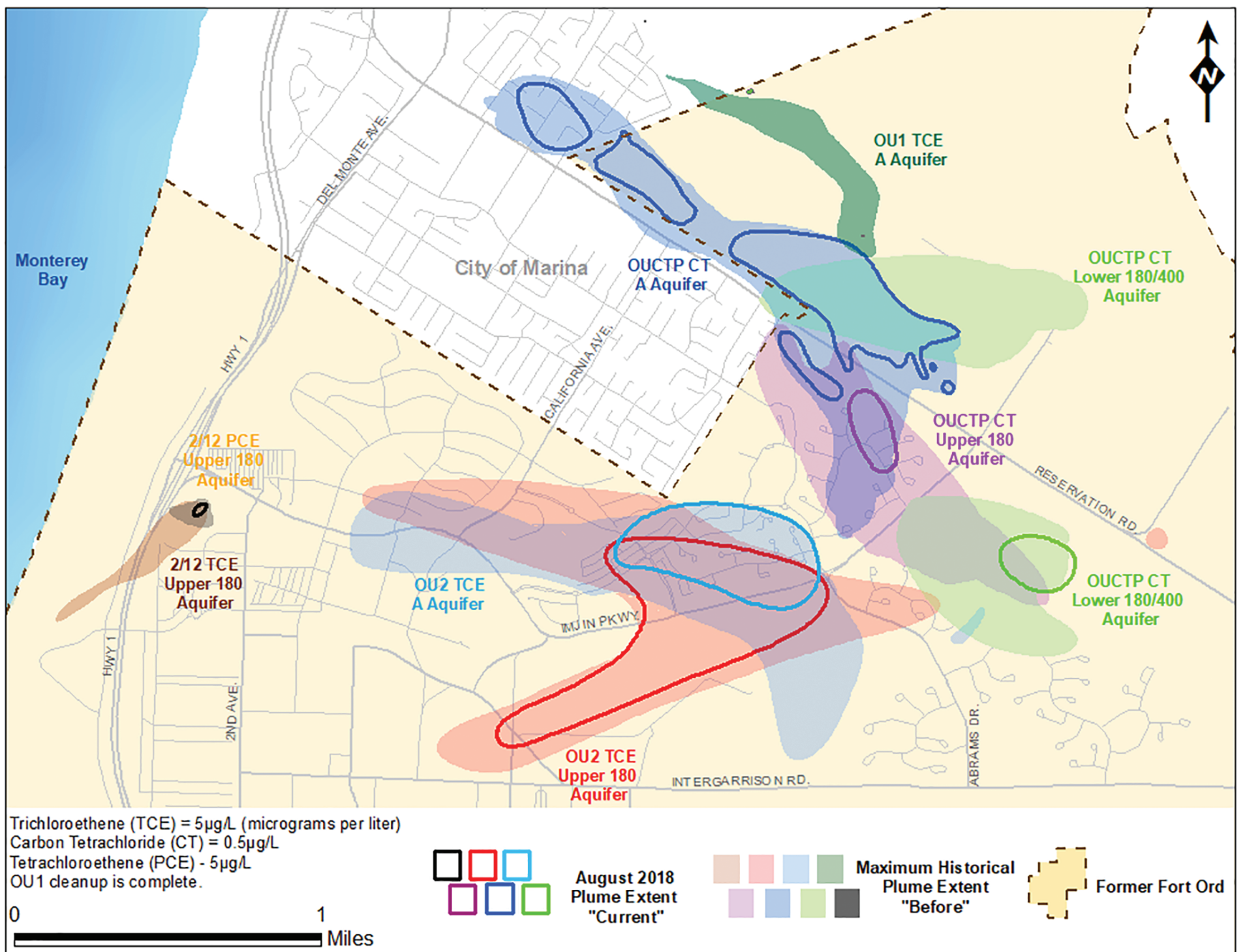
contamination plumes which increases system efficiency, and the new plant is larger which allows for more contaminated groundwater to be processed in a

shorter amount of time. Monterey Peninsula College is now able to use the land where the old treatment facility (now removed) was located.

Fort Ord drinking water is safe and protected from contamination plumes.

The Marina Coast Water District supplies drinking water to the City of Marina and former Fort Ord. Fort Ord drinking water meets all Federal and State regulatory standards. Drinking water quality is regularly tested and results are reported in an annual Consumer Confidence Report found at:

https://www.mcwd.org/gsa_ccr.html



Map showing original and current groundwater contamination plumes at Fort Ord.



New Operable Unit 2 Groundwater Treatment Plant located within the landfill property.

Landfill

The Army operated a landfill during the years Fort Ord served as a training base. The landfill provided waste disposal for Fort Ord's housing, offices and support facilities, such as machine shops and motor pools. The Army stopped accepting waste from the base operations and housing into the landfill in 1987. Like many municipal landfills from this era, Fort Ord's landfill was later found to be leaching hazardous chemicals into the groundwater beneath it. A treatment facility (see previous article) cleans the groundwater. The landfill cells are now covered with a special impermeable cover so that rain water cannot contact the waste and cause chemicals to leach through the soil into groundwater beneath

the landfill.

As with most landfills, decay of organic waste produces gases (primarily methane and carbon dioxide). Over time, as wastes continue to decay, less methane will be produced and eventually will decline to near zero. While methane gas has practically no toxic effects, at levels of 5% to 15% in air, methane can be ignited and could endanger landfill workers and nearby residents. A gas extraction and treatment system restricts landfill gas from reaching high concentrations and migrating off the landfill. The system consists of a thermal treatment unit which extracts landfill gas from around the perimeter of landfill cells and destroys methane and potentially hazardous trace gases collected

from under the landfill cover.

There is a maintenance program to make sure treatment systems are operating efficiently and the landfill cover system remains intact. The cover is inspected routinely by Fort Ord cleanup workers and Monterey County officials, and repairs are made to any minor damage caused by erosion and animals. Reducing rodent populations helps maintain the integrity of the landfill cover. To help with this task, owl boxes and raptor perches were installed at the landfill in 2017 to attract raptors and encourage the natural removal of gophers, ground squirrels and other rodents. Additional boxes and perches were installed in 2018 to enhance this successful, natural system.

Soils

The Army is required to clean up soil contamination that could harm the health of human beings, as well as plants and animals.

Explosive compounds, metals, and hydrocarbons may be present in areas

where munitions and munitions-related training occurred. All cleanup sites identified in the Site 39 Record of Decision Amendment have been completed. Three additional areas have been identified. There may be additional soil cleanup loca-

tions identified as the munitions cleanup moves forward in the Impact Area Munitions Response Area – soil remediation will resume after munitions cleanup is completed and remaining soil cleanup locations are identified.

Community Involvement and Outreach

The Army has an extensive outreach program to keep the community informed and involved with the cleanup. Community involvement at the former Fort Ord Cleanup includes assessing the interest of the community through surveys, public meetings and information sessions.

The Army also provides displays and tours where community members can learn about the cleanup and share their ideas and concerns with cleanup officials. Addressing these concerns involves providing information, developing alternatives, responding to comments, and monitoring results. We continue to assess our outreach to meet the diverse needs of the Monterey County community. You can assist by completing the 2019 community survey in this newsletter.

The Army partners with the U.S. Environmental Protection Agency, California Department of Toxic Substances Control, California Regional Water Quality Control Board, and other agencies.

The key upcoming events are listed below.

August 30, 2019: If you happen to be at the Monterey County Fair during military appreciation day, look for the U.S. Army Fort Ord cleanup information booth.

October 26, 2019: Join other volunteers on the Fort Ord National Monument and lend a hand in collecting native plant seed or performing other rewarding work in a beautiful setting. Volunteers at the event will be treated to a free lunch and entertainment at the intersection of Jack's Road and Skyline Road (Lightfighter LZ) following the work project. Details, including driving directions and a map will be posted in the News section of FortOrdCleanup.com.

February 1, 2020: Open House and Bus Tours with focus on soil and groundwater cleanup

May 2, 2020: Guided walk in the Impact Area with focus on habitat, munitions cleanup and prescribed burns

July 18, 2020: Open House and Bus Tours with focus on munitions cleanup and habitat

Please check our website for announcements.



Fort Ord Environmental Cleanup Community Survey 2019

- When did you become aware of the environmental cleanup of the former Fort Ord?

- Is the information you currently receive about the Fort Ord cleanup:
 about right too much too little
 other (please describe)

- What type of Fort Ord cleanup activities/information interests you?
 groundwater soil military munitions
 vegetation burning property transfer
 Environmental Services Cooperative Agreement
 other (please describe)

- Are you aware of the Fort Ord Reuse Authority Environmental Services Cooperative Agreement munitions remediation program?
 Yes No

- Is there a person, group, or organization you think would be interested in talking to the Army about the Fort Ord cleanup process?

- Is there anything else about the cleanup you would like to share with us?

- Do you live in the Monterey Bay – Salinas Valley area?
 Yes No If yes, how long:
 0-5 years 6-12 years 13-20 years 21 or more years

THANK YOU VERY MUCH FOR YOUR TIME AND INTEREST

Please return the completed survey by mail no later than September 30, 2019, to:

Fort Ord Environmental Cleanup Community Survey 2019

Fort Ord BRAC Office

P.O. Box 5008

Monterey, CA 93944-5008

Be sure to affix the appropriate postage. Call Melissa Broadston (831) 393-1284 for more information.

Save a stamp/paper and take the survey online at www.FortOrdCleanup.com. Go to the news section.

Para obtener una copia en Español contacte (831) 393-1284.



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Fort Ord Environmental Cleanup

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FORT ORD AGENCY CONTACTS

The Army is responsible for conducting cleanup of the former Fort Ord, but it must do so in a manner that complies with federal and state laws and under the supervision of federal and state regulatory agencies. The Fort Ord cleanup is being conducted under the Superfund or "CERCLA" cleanup process. CERCLA is an acronym for the federal law entitled the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund. It encompasses cleanup of soil and groundwater that contain hazardous substances such as metals, pesticides, and other chemical contaminants common to landfills, firing ranges, and other military sites. At Fort Ord, the Superfund cleanup is supervised by the U.S. Environmental Protection Agency, California Department of Toxic Substances Control and the Regional Water Quality Control Board. Under an agreement between the Army and regulatory agencies, each agency assigns a representative to the Base Cleanup Team. Contacts for each of the participating agencies in Fort Ord's cleanup are listed below.

The Environmental Services Cooperative Agreement (ESCA) is an Army grant to the Fort Ord Reuse Authority (FORA) for munitions remediation on 3,340 acres that have been transferred to FORA. The FORA ESCA Remediation Program is supervised by U.S. Environmental Protection Agency and California Department of Toxic Substances Control.

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