

Fort Ord Environmental Cleanup 2014 Annual Report

Fort Ord BRAC Office

October 2015

PRESCRIBED BURNS PLANNED FOR FALL 2015

At the time of publication, significant wildfires have limited the number of fire fighting resources. As part of the Fort Ord prescribed burn program, burns are not conducted until fire fighting resources are available and weather conditions provide for safe burn operations and good smoke behavior.

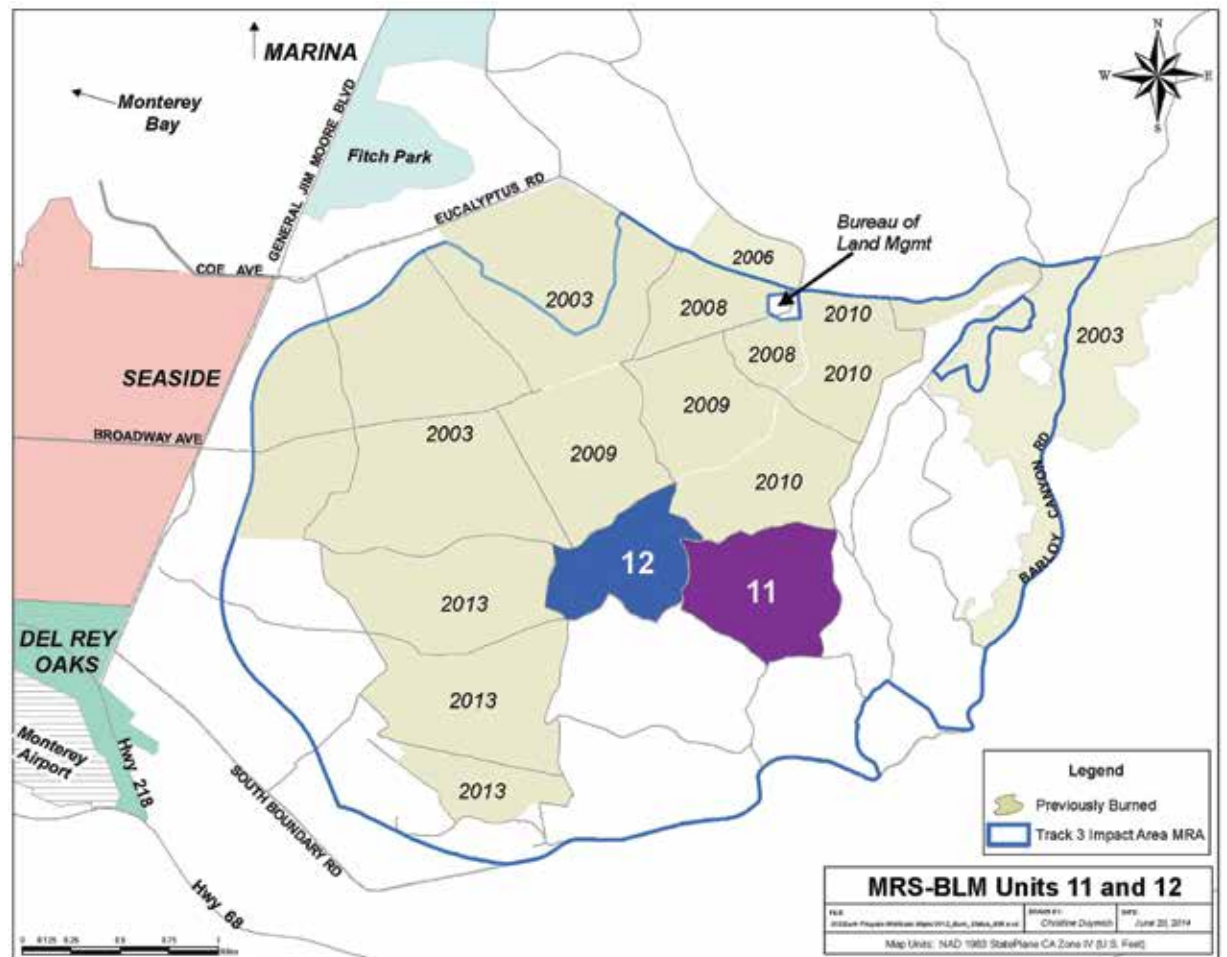
The Army has identified two units (Units 11 and 12, see map at right) in the Fort Ord Impact Area for prescribed burning as part of its 2015 activities. Munitions removal has already been conducted in these areas. The units planned for burning are part of the Fort Ord National Monument and, following completion of the cleanup, will be transferred to the Bureau of Land Management (BLM). These burns are required under an agreement between the Army and the U.S. Fish and Wildlife Service as a part of the Installation-Wide Multispecies Habitat Management Plan (HMP). The vegetation in this area is primarily central maritime chaparral which depends on periodic fires to sustain its diversity. Several rare, threatened and endangered plant species occur in the central maritime chaparral at Fort Ord. These units are required to be burned to encourage successful recovery of the rare, threatened, and endangered fire-dependent plant species.

The Army intends to conduct a prescribed burn as soon as weather permits, in October or later. A prescribed burn may commence when fire fighting resources are available and when conditions provide for safe operations and good smoke behavior in order to minimize the impact to residents in the surrounding communities. Suitable weather conditions include clear skies, moderate temperatures (between 45° and 90°), and a day without much wind.

Unit 11 is 273 acres and Unit 12 is 203 acres. The map above shows the location of Units 11 and 12 as well as the areas burned since 2003.

DIRECT NOTIFICATION PROGRAM

The Army understands that prescribed burns can affect air quality. Smoke from vegetation burns can affect certain people, such as those with preexisting respiratory problems. These individuals are encour-



Map of 2015 burn units

aged to take precautions during prescribed burns to reduce their exposure to smoke. These precautions include staying indoors with doors and windows closed, limiting outdoor activity when smoke is present, or even leaving the area temporarily.

If you register for the direct notification program, the Army will notify you when it first mobilizes. This occurs when optimum burn conditions are anticipated and resources (equipment and personnel) are available. This mobilization period could last for several days before the actual prescribed burn is conducted. The Army will also notify you when the burn is ignited and when it is complete.

To sign up for the Prescribed Burn Direct Notification Program, go to www.FortOrdCleanup.com to register on line or call 1-800-852-9699 to register over the phone. You must register each year. The Army does not share your contact information. Real time fire updates will be available via Twitter @POMgarrison #OrdBurn2015.

TAKE A TOUR OF THE FORT ORD CLEANUP PROGRAM

Have you ever wanted to take a look at the many different cleanup efforts underway at Fort Ord? Bus tours and nature walk events are available for community member participation. For those of you who may not have the time to take a real tour, the virtual tour starts on page 3. If you are interested in the schedule for tours and our annual nature walk, check our web site www.FortOrdCleanup.com or call (831) 393-1284.

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MUNITIONS CLEANUP ACTIONS

The Army continues to remove munitions and explosives of concern from former Fort Ord property. In 2014, more than 500 acres of former range areas were cleaned up and prepared for future management by the Bureau of Land Management (BLM) as part of the Fort Ord National Monument.

The Army's munitions and explosives of concern removal actions in 2014 were focused on Impact Area Units 7, 10 and 33 following a prescribed burns completed in October 2013. The Army has completed removal of all munitions and explosives of concern located on the surface of those units. A total of 357 munitions and explosives of concern items were removed, mostly 37-millimeter (light artillery) projectiles. Once the surface munitions and explosives of concern items were removed, the Army used digital geophysical technology to map concentrations of metal below the surface. This mapping can be used to guide land use decisions such as locating future roads and trails. A draft report describing this cleanup effort was issued in July 2015 (Administrative Record number OE-0856.)

The Army also completed a comprehen-

sive evaluation of an area known as BLM Area B and MRS 16 in 2014. The Army issued a Proposed Plan, and sought public comment in 2015. The Proposed Plan identifies the Army's preferred remedial action to address site contamination. The Army and regulatory agencies are reviewing the public comments made during the Proposed Plan public comment period. A final cleanup decision that outlines the cleanup for these areas is expected in early 2016. This area is Stop 2 on our virtual tour (go to page 4 for details) and consists of approximately 1,700 acres north and east of the Impact Area. Large portions of this land have already been transferred to the BLM, and contains some popular recreation trails. BLM Area B and MRS 16 are part of the Fort Ord National Monument, created in 2012. Prior to the BLM transfer, the Army investigated identified munitions response sites and conducted munitions and explosives of concern removal actions at specific sites. The evaluation determined that the Army will do some additional work in portions of those areas in future years.

In 2014 the Army conducted cleanup in units 1, 2, and 3 and removed munitions

and explosives of concern. These were areas where it was impractical to use prescribed burns due to the safety risk to adjacent communities from surface munitions and explosives of concern. So the brush was cut, and the munitions removal begun. With the surface munitions and explosives of concern removal completed (2015), the Army will need to conduct prescribed burns on these units once the vegetation has grown back enough to carry a fire (likely in 3-5 years) to ensure that this habitat is successfully rejuvenated. A report on the munitions removal work was issued in August 2015 (Administrative record number OE-0860.)

The Army also completed cleanup of two small portions of the Watkins Gate Burn Area in 2014. Most of this area was burned in 2003, but a few areas didn't burn and still needed to have a munitions removal. A report of this work was issued in December 2014 (Administrative Record number OE-0832.)

Finally, the Army also completed removal of munitions and explosives of concern in buffers along the western edge of the Impact Area, and completed subsurface removals in the majority of fuel breaks.

HABITAT PROTECTION

The former Fort Ord land supports many biological communities. Central maritime chaparral is the most extensive natural community at Fort Ord, occupying approximately 12,500 acres in the south-central portion of the base. Oak woodlands are widespread at Fort Ord and occupy the next largest area, about 5,000 acres. Grasslands, primarily in the southeastern and northern portions of the base, occupy approximately 4,500 acres. Of the 11 plant communities identified at Fort Ord, central maritime chaparral and valley needlegrass grassland are considered rare or declining and are of the highest priority according to the California

Department of Fish and Wildlife.

The Army manages these habitats under an HMP developed in consultation with the U.S. Fish and Wildlife Service, and the 2015 Programmatic Biological Opinion issued by the U.S. Fish and Wildlife Service. The general goal of the HMP is to "promote preservation, enhancement, and restoration of habitat and populations of HMP species while allowing development on selected properties that promotes economic recovery after closure of Fort Ord." The HMP identified areas that could be developed with or without restrictions and areas set aside as habitat reserves or corridors with specific habitat management guidelines.

As discussed above, the Army plans to conduct post-cleanup prescribed burns in Units 11 and 12 where brush was removed by cutting. These areas are required to be burned to encourage successful recovery of the central maritime chaparral habitat. This is only a part of the Army's actions to protect the environment on the former Fort Ord.

The Army monitors rare plant and animal species both before and after cleanup activities, and uses the monitoring data to assess whether the success criteria specified in the HMP have been met. Annual reports documenting the 2014 monitoring results can be accessed at www.FortOrdCleanup.com.

COMMUNITY RELATIONS PROGRAM

Fort Ord maintains an extensive community outreach program to keep the public informed about the cleanup activities at the former Fort Ord. The Community Involvement Mobile Workshop and Technical Review Committee are the key outreach avenues for community participation. These outreach avenues are supplemented by other major community outreach formats

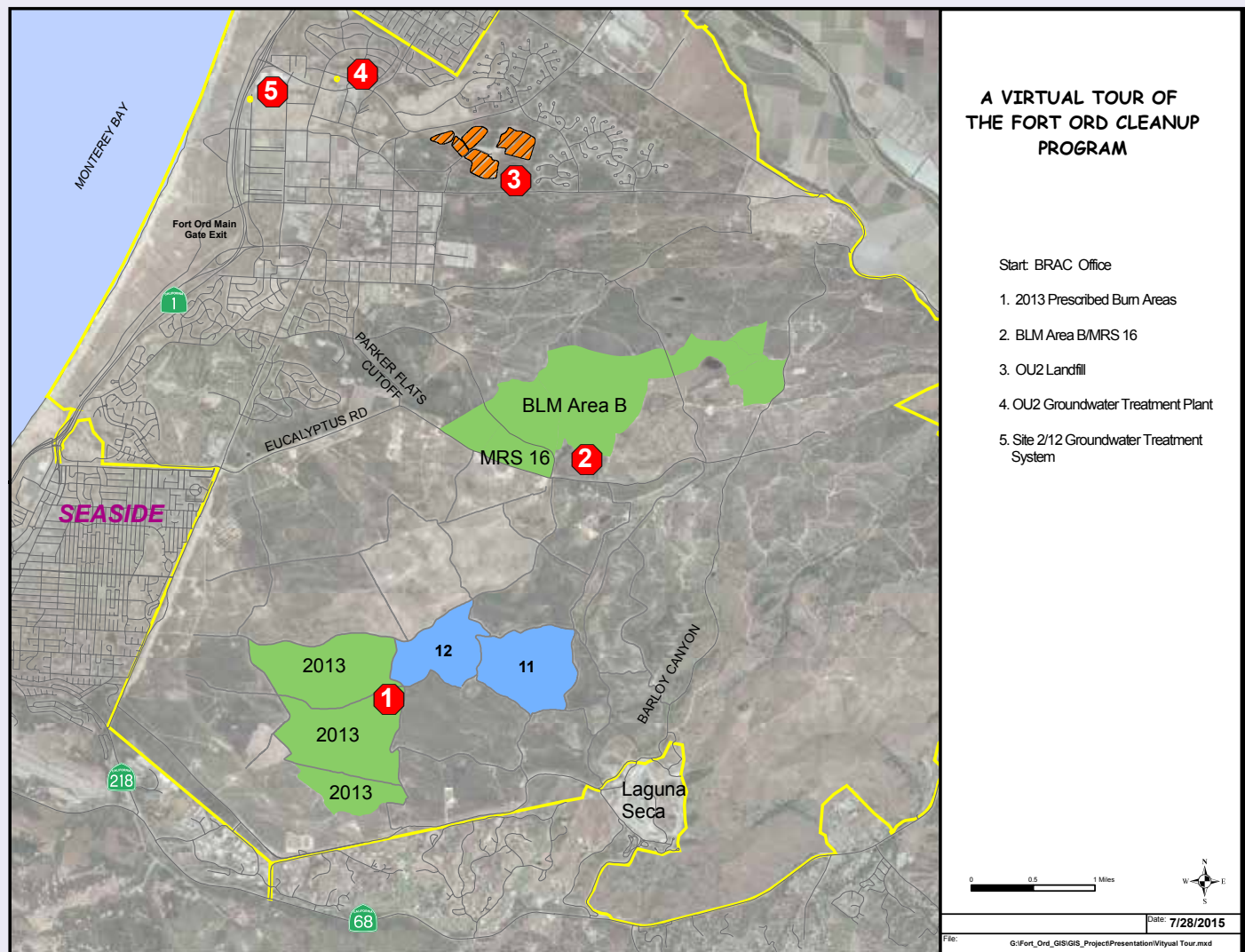
including: Fort Ord cleanup web page, public comment meetings, information booths at community events, door-to-door notifications, open houses, guided walks, bus tours, presentations, monthly mailings, publications, media relations, and the maintenance of information repositories and the Administrative Record. Over the last few years, the bus tours and nature walks have been well attended.

COMMUNITY RELATIONS SURVEY

Every two years, we circulate a survey designed to provide us with information about how the community sees our outreach and cleanup endeavors. This survey is included in this newsletter on **page 7**, and we invite you to complete it and send it to us. You can also complete the survey online at www.FortOrdCleanup.com.

A Virtual Tour of the Fort Ord Cleanup Program

Our virtual tour begins in the parking lot of the Base Realignment and Closure (BRAC) Building on Gigling Road. This is the home of the Fort Ord Cleanup Program. We board our bus and head south on General Jim Moore Boulevard. Then we turn east on South Boundary Road. It's fortunate this is a make-believe tour because this is a site that's off limits to the public, to protect your safety. But we can visit it in your mind's eye and through the photographs below.



1

Stop 1: Prescribed Burn Areas Conducted October 14-15, 2013

This is the site of the most recent prescribed burns, conducted in October 2013.

The purpose of the prescribed burns was to remove brush that obscured the surface of the land where there could still be munitions and explosives of concern. The brush makes it unsafe for munitions cleanup workers to work because they cannot see munitions and explosives of concern items that could be triggered by bumping or stepping on them. So the land must be cleared of brush in preparation for cleanup.

During 2014, munitions cleanup workers removed the munitions and explosives of concern on the ground surface of the units. As noted previously, the central maritime chaparral plant community is fire-dependent (grows well only if burned periodically), and, as you can see in the photo the burned vegetation is already starting to grow back.

Units 11 and 12 are where prescribed burns will be conducted in Fall 2015 (see page 1 for a map).



Photo shows fire following poppies and regrowth after 2013 burn.

2

Stop 2: BLM AREA B and MRS 16

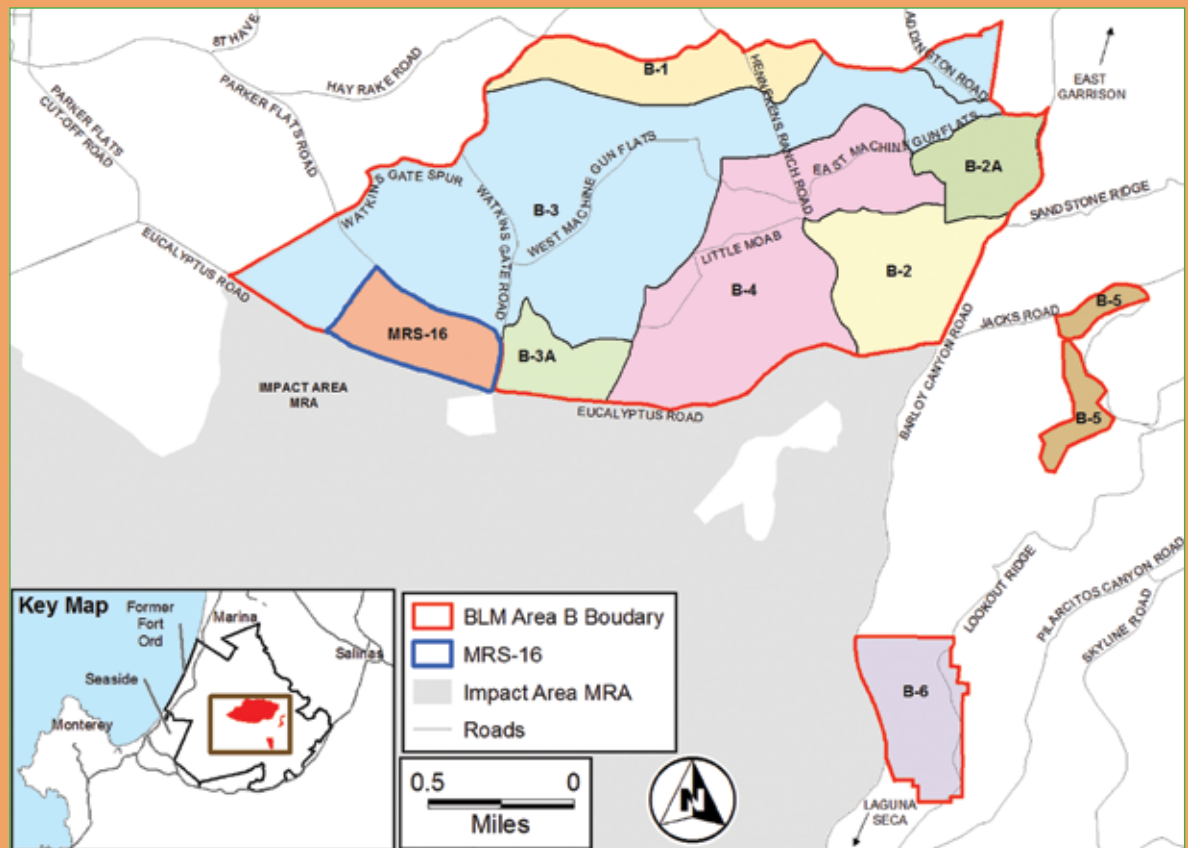
We now climb back on the virtual bus and proceed back up General Jim Moore Boulevard, turning east on Eucalyptus Road. We stay on Eucalyptus Road, stopping to look at an area called BLM Area B, and adjoining land, MRS 16.

The Fort Ord Public Lands have been managed by the Bureau of Land Management (BLM) since the lands were transferred from the Army in 1996. The property, which includes 86 miles of trails, is extensively used for hiking, cycling and horseback riding by local residents and tourists with safety restrictions to protect recreational users and the habitat.

The Army has conducted investigation, sampling, and removal of munitions and explosives of concern within the transferred BLM lands.

The Army conducted a comprehensive munitions risk evaluation of BLM Area B and MRS-16 in 2014 and concluded that visitors who comply with posted restrictions and remain on designated trails on the Fort Ord National Monument are safe from munitions risk.

Just to the north of Eucalyptus Road, and adjoining Area B, we are looking at



Map of BLM Area B and MRS 16

MRS-16. There was a prescribed burn on MRS-16 in 2006, and the Army has

conducted a munitions cleanup on the site. No further work is proposed for this area.

3

Stop 3: Operable Unit 2 – Landfill

Our bus now proceeds north on General Jim Moore Blvd, turning right on Inter-Garrison Road, left on 6th Avenue to 8th Avenue, then right onto Imjin Parkway. We stop at a large mound (see photo).

When Fort Ord was in full operation, it was like a medium-sized city with typical community services. Like many communities, it established a landfill to handle its solid waste. But as also happened in many communities at that time, the landfill leaked and contaminants seeped into the groundwater beneath the landfill.

The Army not only had to find some way of removing the contaminants from the groundwater, it also had to find a way of keeping additional contamination from moving through the soil and entering the groundwater. This contaminant transport would occur whenever rainwater falling on the landfill carried contaminants in the soil at the landfill into the groundwater below the landfill. In consultation with federal and state environmental regulators,

the Army constructed an engineered, non-permeable cover on the landfill, so that the contents of the landfill are not exposed to precipitation. With no additional water reaching the contents of the landfill, no additional contamination reaches groundwater.

The landfill still plays a role in the Fort Ord cleanup program. For example, when the Army cleaned up beachfront rifle ranges, it deposited soils containing lead (from the spent bullets) in the landfill. Then, an impermeable landfill cover was placed over this material.

More recently, one section of the landfill



Landfill during installation of the engineered cap and covering with natural habitat

was used for placement of lead-contaminated soils from Site 39 (primarily the Impact Area). An engineered cover was placed over the soil and welded to the existing cover to seal in these soils with a bottom and top impermeable cover.

Groundwater Cleanup

Stops 4, 5, and 6 all have something to do with groundwater cleanup. Here's a quick primer:

What is groundwater?

Groundwater is water that seeps into the ground when rain falls, and remains there until pumped to the surface.

What's an aquifer?

Water seeps into the ground until it hits a layer of clay or some other non-permeable material and can't go any further. Then the water remains in the ground, sometimes for thousands of years. Areas where water is held in place in the soil are called aquifers.

Are there aquifers below Fort Ord?

There are at least three aquifers below the surface at Fort Ord, separated by impermeable layers. The aquifer closest to the surface is called the A Aquifer. The other aquifers are named based on their depths below the ground surface.

What is a plume?

When a contaminant reaches an aquifer it begins to spread out in the water in a manner known as a plume. The map on page 6 shows the maximum extent of the contaminant plumes at Fort Ord, as well as their current size following treatment.

YOUR DRINKING WATER IS SAFE

Water pumped from the Marina Coast Water District Supply wells meets the drinking water safety standards established by the US Environmental Protection Agency and the California State Water Resources Control Board, Division of Drinking Water.

4

Stop 4: Operable Unit 2 Groundwater Treatment Plant

We now stop at a building on Imjin Parkway. Several large blue tanks are readily visible.

While the cover on the landfill solved the problem of new contaminants reaching the groundwater, the Army still had the problem of addressing contaminants already in the groundwater under the landfill. Eleven chemicals of concern were identified in the groundwater, with trichloroethylene (commonly known as TCE) as the primary contaminant of concern. This plume is known as Operable Unit 2.

The Army constructed a number of extraction wells and piping to pump the water and send it to the treatment plant shown in the photos at right. At this treatment plant, the water is filtered through granular activated carbon (which removes contaminants) housed inside the large blue tanks in the photo. Once the contaminants have been removed, the treated water is then returned to an aquifer.

As the contaminated water is pumped through the tank, the chemicals are trapped in the carbon. Over time, the carbon becomes saturated with chemicals (can't hold any more chemicals) and must be replaced with fresh granulated activated carbon. The chemicals stick to the granular activated carbon, so the carbon must be pumped into a tanker truck and taken to a recycling facility where high temperatures can separate (remove) the chemicals from the carbon. The recycled/cleaned carbon can be used again and the chemicals removed from the carbon can be destroyed.

The treatment program has been

expanded several times, and is working effectively to halt the spread of the plume, and is expected to continue for some years to come.

In 2016-2017, treatment plant operations will be relocated to an area adjoining

the landfill parcel. This move will make the groundwater treatment process much more efficient and consolidate operations within the landfill area, while allowing the site of the existing plant to be developed for other uses.



Photos show (above) removal of spent carbon from tanks and (below) installation of replacement, fresh carbon from tanker truck.



5

Stop 5: Operable Unit Carbon Tetrachloride

The next site is to the northeast, off Imjin Parkway.

Between 1940 and 1950, the Army used carbon tetrachloride to clean communications equipment in a location off the Preston Park, Lexington Court area. Some carbon tetrachloride was spilled on the ground, moved down through the soil, and contaminated the groundwater.

Historically, carbon tetrachloride was used for a variety of purposes including in firefighting, as a pesticide, in production of refrigerants, and as a cleaning agent (including household cleaning products). But as information about possible health effects was learned, substitutes were

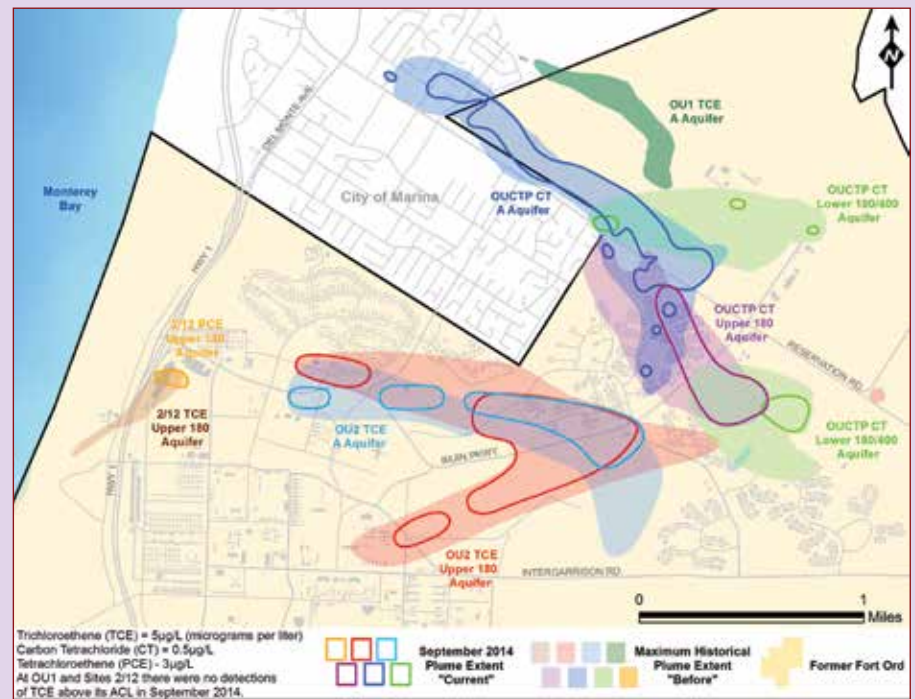
OPERABLE UNIT 1 ATTAINMENT MONITORING IN PROGRESS

Operable Unit 1 was a groundwater plume contaminated with a chemical called TCE. With treatment, the plume has been shrinking steadily and, samples taken in September 2014 and December 2014 show the water quality has reached the cleanup goals (aquifer water quality standards). The Army will continue to monitor this area to ensure the cleanup has been attained. In the interim, the treatment facility is not operational, but remains on standby in case monitoring shows any increase in TCE above cleanup goals.

found. In 1970, carbon tetrachloride was banned in consumer products in the United States.

In the aquifer closest to the surface, the A-Aquifer, the Army has used a natural cleanup process which consists of adding lactate, a milk product, into the groundwater. The lactate acts as a food source to encourage naturally occurring microbes to break down potentially harmful chemicals into less toxic or non-toxic substances. The Army samples the groundwater every quarter to ensure the success of this treatment. As shown in the map for Stop 5, this treatment has been successful in shrinking the carbon tetrachloride plume.

In deeper aquifers, the Army pumps out groundwater using extraction wells, and then sends the contaminated water to a groundwater treatment system to remove the carbon tetrachloride and other chemicals using



Map to Compare Groundwater Contamination Areas Historic and Current

granulated activated carbon filtration. The clean water is then returned to the aquifers. At still lower levels below the surface, due to low levels of contamination and difficult technical challenges, the Army and federal and State agencies determined that natural processes are capable of breaking down chemicals over time.

The Army is carefully monitoring the effectiveness of the groundwater remediation at all three levels, and additional monitoring wells were constructed in June 2015.

6

Stop 6: Sites 2/12 Groundwater Treatment Plant

We've now driven to a building just to the east of Highway 1, between Imjin Parkway and 8th Avenue.

This is the Sites 2/12 groundwater treatment plant. The groundwater under this site was contaminated by the improper disposal of solvents from former vehicle repair facilities.

Groundwater cleanup is in progress. Contaminated water is pumped from the ground using extraction wells and sent to a treatment plant (see photo). At the plant, the water is treated using granular activated carbon filtration and air stripping. Air stripping is the process of moving air through contaminated groundwater or surface water in an above-ground treatment system. Air stripping removes chemicals

called "volatile organic compounds" or "VOCs." VOCs are chemicals that evaporate easily, which means they can change from a liquid to a vapor (a gas). The air passing through contaminated water helps evaporate VOCs faster. After treating the water, the air and chemical vapors are collected, and the vapors are either removed or vented outside if VOC levels are low enough. Air stripping is commonly used to treat groundwater as part of the "pump and treat" cleanup method. When the treatment is complete, the water is then returned to the aquifer.

Additional construction completed this summer will more efficiently remove VOCs from the soil before it reaches the groundwater.



Sites 2/12 treatment plant

The Army and regulatory agencies estimate that the treatment process at Sites 2/12 will continue for another 3 to 4 years, after which groundwater is expected to meet all regulatory standards.

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Fort Ord Environmental Cleanup
Community Relations Office
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FORT ORD CLEANUP PROGRAM AGENCY CONTACTS

U.S. Department of the Army Base Realignment and Closure (BRAC) Fort Ord Contacts

P.O. Box 5008, Monterey, CA 93944-5008

William Collins, Fort Ord BRAC
Environmental Coordinator
Phone: (831) 393-1284
Email: William.K.Collins.civ@mail.mil
Website: www.FortOrdCleanup.com

Fort Ord Community Relations Office

Phone: (831) 393-1284 or
1-800-852-9699
Email: melissa.m.broadston.ctr@mail.mil

Fort Ord Reuse Authority (FORA) Environmental Services Cooperative Agreement (ESCA) Remediation Program Contacts

920 2nd Ave, Suite A, Marina, CA 93933

Stan Cook, Program Manager for issues
related to the ESCA Remediation
Program for Military Munitions
Phone: (831) 883-3672
Website: www.foraescarp.com
Email: ESCA@fora.org

U.S. Environmental Protection Agency Region IX Contacts

75 Hawthorne Street, San Francisco, CA 94105

Martin Hausladen, Remedial Project Manager for
groundwater issues
Phone: (415) 972-3007
Email: hausladen.martin@epa.gov

Lewis Mitani, Remedial Project Manager for soil
remediation and the Army's military munitions
response program
Phone: (415) 972-3032
Email: mitani.lewis@epa.gov

Judy Huang, Remedial Project Manager for the
FORA's ESCA Remediation Program
Phone: (415) 972-3681
Email: huang.judy@epa.gov

Viola Cooper, Community Involvement
Coordinator
Phone: (415) 972-3243 or (800) 231-3075
Email: cooper.viola@epa.gov

California Environmental Protection Agency Department of Toxic Substances Control Contacts

**8800 Cal Center Drive,
Sacramento, CA 95826-3200**

Ed Walker, Remedial Project Manager for
issues related to military munitions
Phone: (916) 255-4988
Email: Ed.Walker@dtsc.ca.gov

Min Wu, Remedial Project Manager for water
and soil cleanup
Phone: (916) 255-3621
Email: Min.Wu@dtsc.ca.gov

Tammy Pickens, Public Participation
Specialist
Phone: (916) 255-3594
Email: Tammy.Pickens@dtsc.ca.gov

California Environmental Protection Agency Regional Water Quality Control Board Central Coast Contacts

**895 Aerovista Place, Suite 101,
San Luis Obispo, CA 93401-7906**

Grant Himebaugh, Remedial Project Manager
for water issues
Phone: (805) 542-4636
Email: ghimebaugh@waterboards.ca.gov

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