

4.10 HAZARDOUS AND TOXIC WASTE SITE REMEDIATION

4.10.1 Regulation of Hazardous Materials and Waste

This section incorporates by reference information from the Other Physical Attributes Baseline Study of Fort Ord, California available for review at the public information repository established at the Seaside Branch Library (U.S. Army Corps of Engineers, Sacramento District 1992e).

Fort Ord was added to the National Priorities List of Hazardous Waste Sites on February 21, 1990. A federal facilities agreement, negotiated under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and signed by EPA, the California Department of Health Services, and the Central Coast Regional Water Quality Control Board, became effective on November 19, 1990. Although the federal facilities agreement was signed by the Department of Health Services, the agency now responsible for oversight is the California Environmental Protection Agency, Department of Substances Control (DTSC). The federal facilities agreement requires the Army to perform the Superfund cleanup process that is described in the Other Physical Attributes Baseline Study of Fort Ord, California (U.S. Army Corps of Engineers, Sacramento District 1992e).

The identification, remediation, and disposal of hazardous waste associated with the Superfund cleanup process at Fort Ord is regulated by the Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; the Superfund Amendments and Reauthorization Act; California Code of Regulations, Titles 22 and 23; the California Water Code; and all applicable, relevant, and appropriate requirements. Under the federal facilities agreement, the Army is responsible for conducting the Superfund cleanup process, and EPA is the lead agency for regulatory enforcement and oversight of Superfund activities; however, the Army also must submit findings to the DTSC and the Central Coast Regional Water Quality Control Board, both of the California EPA. The Central Coast Regional Water Quality Control Board also regulates nonhazardous wastes that have affected groundwater. The federal facilities agreement, as well as the record of decision, to be signed after remedial investigation/feasibility study (RI/FS) activities are approved by the regulatory agency signatories to the federal facilities agreement, certifying the lands as clean or protective of human health and environment, identify the Army's responsibility for long-term monitoring and cleanup.

Pursuant to DOD standard 6055.9-STD, the Army is responsible for characterizing and removing unexploded ordnance. This cleanup process involves historical record reviews, site characterization, surface clearance, and possible subsurface clearance of unexploded ordnance. Surface and subsurface clearance activities are described in Section 5.1.2, "Contaminated Sites".

4.10.2 Historic Storage and Disposal of Hazardous Waste

Fort Ord has been used for small-scale industrial activities since it was established in 1917. Reviews of chemical use, storage, and disposal practices indicate that fuel, oil, and other automotive chemicals are used and stored extensively throughout the installation. Small quantities of other chemicals are used in localized areas (U.S. Army Corps of Engineers 1991a).

Domestic and industrial wastes generated on the installation have been handled primarily through the sewage treatment system, disposed of at one of several landfills, or burned in firefighter training areas. Some buildings have french drain systems and gravel-lined dry wells that may have been used for waste disposal (U.S. Army Corps of Engineers 1991a). Materials released to those drainage systems would come in direct contact with the subsurface environment. Although most waste disposal occurs in designated areas, unauthorized releases have been reported or are suspected. The Army established a toll-free telephone number to solicit information on unauthorized chemical releases.

10.3 Source Areas of Hazardous and Toxic Waste

As part of the Superfund cleanup program, the Army is conducting site characterization and remedial investigation studies at Fort Ord to evaluate soil and/or groundwater contamination resulting from storage, disposal, or unauthorized releases of hazardous wastes.

The RI/FS work plan prepared by the Army (U.S. Army Corps of Engineers 1991a) describes known or suspected source areas of soil or groundwater contamination at Fort Ord, which were identified after consultation with the Army, EPA, California Department of Health Services, and regional water quality control board. These sites are summarized below. Figure 4.10-1 illustrates general types of operational areas associated with hazardous waste and unexploded ordnance at Fort Ord.

4.10.3.1 Source Areas of Concern

The RI/FS identified the following hazardous waste sources as areas of special concern because of their potential impacts on regional environmental quality (U.S. Army Corps of Engineers 1991a).

Inland Trainfire Ranges. Most of this area consists of the 8,000-acre inland range area with unexploded ordnance, where there is little risk of direct human exposure to hazards under current conditions. However, nitrogen compounds, phthalates, metals, and petroleum from ordnance explosive waste, vehicles, and training activities may have been released to the subsurface environment and could leach into groundwater. These wastes are being evaluated as part of the installation-wide RI/FS. Figure 4.10-2 illustrates the present inland trainfire ranges, historic firing ranges, and other known source or potential source areas of unexploded ordnance.

The highest density of unexploded ordnance and spent ammunition is expected in the central portion of the inland range area. Lower densities of unexploded ordnance are expected in the outer portions of the inland range area and in the training areas to the north and east of the inland range area (Figure 4.10-2).

Grenades and armor-piercing ammunition likely are located throughout the western portion of the range area, cannon rounds may be present throughout the southern half of the range area, mines may be concentrated in the eastern ranges, and howitzer and mortar rounds are expected to be located throughout the entire inland ranges. Mortars and howitzers fired high-explosive, white phosphorous, and illumination rounds; other heavy weapons primarily fired high-explosive or inert rounds.

Naval gun rounds may be present throughout a 6-kilometer area in the eastern trainfire ranges, extending east of the ranges to Lookout Ridge and Pilarcitos Canyon (Figure 4.10-2). Firing of mortar rounds is reported to have occurred from State Route 68 (Oil Well Road) into the inland range area (Figure 4.10-2). Training areas J-2 and K-3 contain evidence of rockets, rifle grenades, and 60-mm mortar shells.

Underground Storage Tanks. During 1991-1992, approximately 130 underground storage tanks (USTs) were removed from Fort Ord. Of these, 8 are currently under investigation for contamination. At this time, 119 USTs are used at Fort Ord and Fritzsche Army Airfield. Of these, 31 are associated with heating plants; 11 provide fuel for generators that operate sewage lifts, water wells, transmitters, or other facilities; 34 store fuel at motor pools or post exchange gas stations; eight store aircraft fuel; four store solvent for dry cleaning or parts cleaning; and 31 store waste oil. Of the 119 USTs in use, 10 are double walled and meet current regulatory standards; the remaining 109 USTs are constructed as single-walled tanks, which are susceptible to leaks. Some leaking USTs and petroleum-affected soils surrounding USTs were detected during site characterization studies. Those petroleum releases also could have affected groundwater.

Figure 4.10-1
 General Types of Operations Associated with Hazardous Waste
 and Unexploded Ordnance

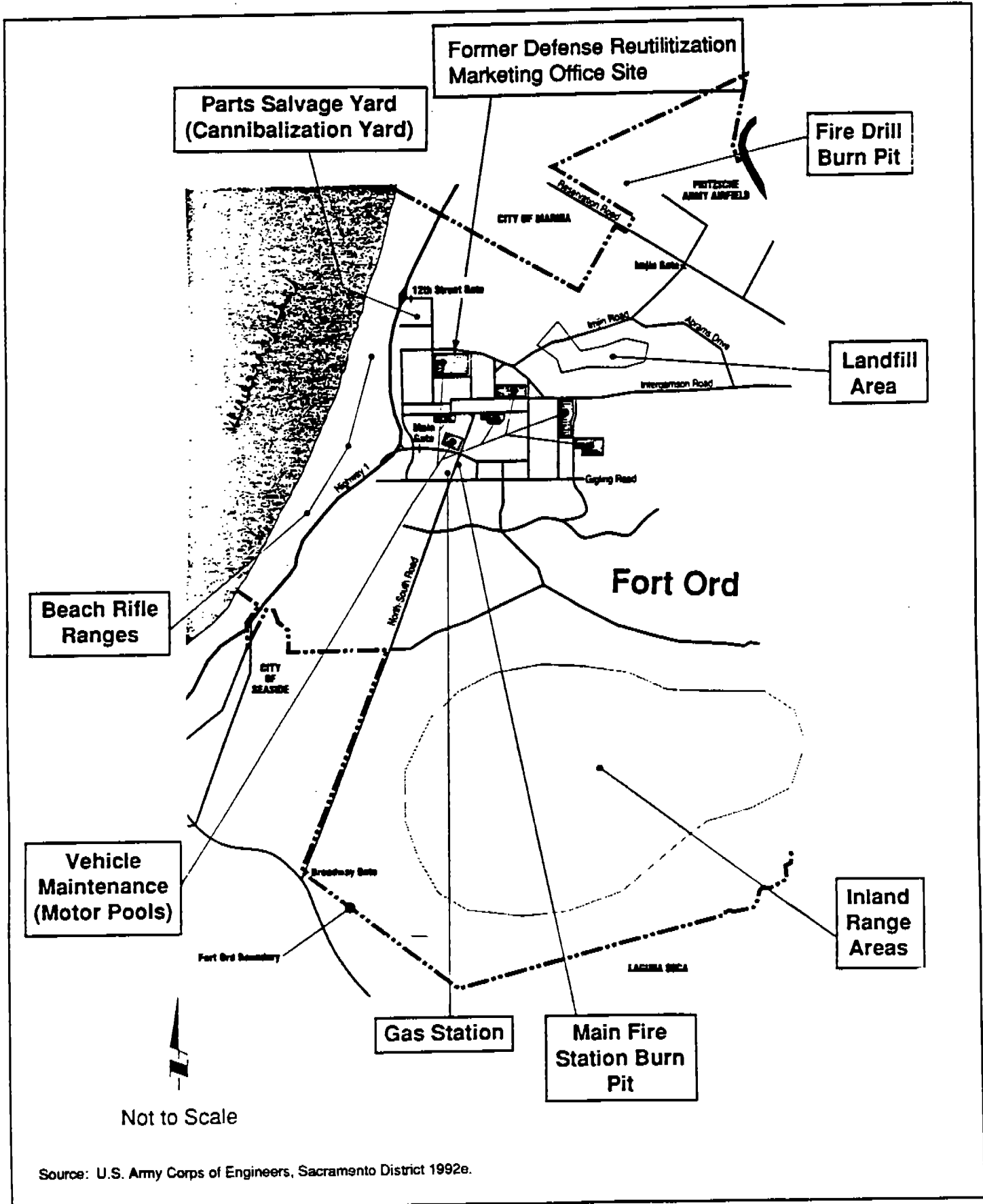
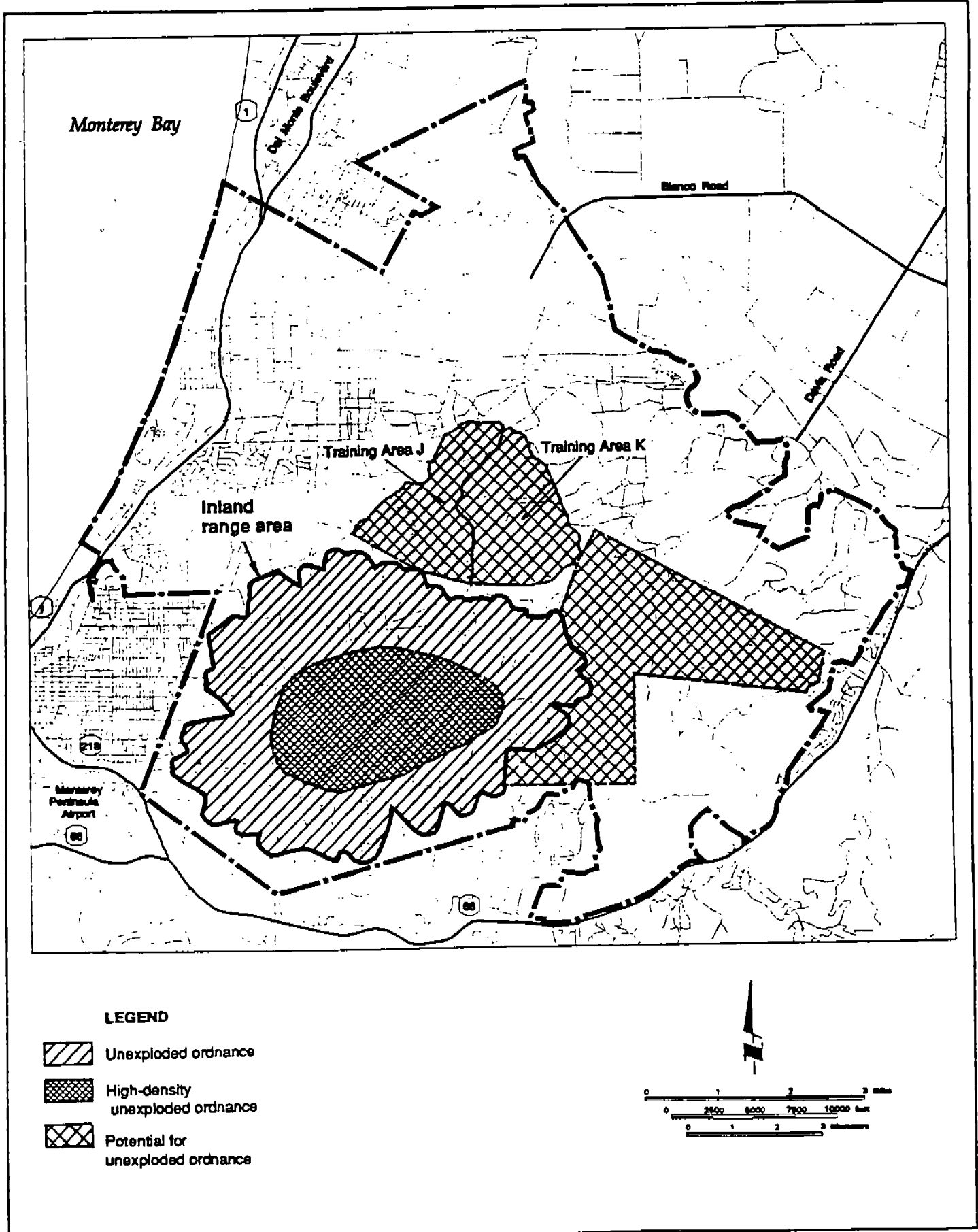


Figure 4.10-2
 Expected Locations of Unexploded Ordnance at Fort Ord



Underground storage tanks at Fort Ord are regulated by the Monterey County Health Department. An UST management plan was prepared for Fort Ord to facilitate the removal, replacement, or upgrading of USTs as necessary to ensure regulatory compliance and protection of the environment. This ongoing program involves assessing the condition and regulatory status of each UST at Fort Ord and removing all unnecessary tanks. To date, approximately 140 USTs have been removed. Vapor recovery systems have been installed in 15 USTs to raise them to regulatory standards (U.S. Army Corps of Engineers 1991b).

Landfills. The Main Garrison landfill is a known source of volatile chlorinated compounds (solvents) detected in groundwater. Four smaller areas in the Main Garrison and one area in the East Garrison also have been used as landfills and could represent sources for soil or groundwater contamination, unexploded ordnance, and ordnance explosive waste. All landfills at Fort Ord are no longer active and are being evaluated as part of the RI/FS process.

Storm Drainage System. The storm drainage system at Fort Ord is considered a potential transport mechanism for urban pollutants. The outfalls of much of the storm drainage system are also considered potential areas of soil contamination. Oil and water separators located in motor pools and maintenance yards are connected to the sewer drainage system, and could overflow into the storm drainage system if operated improperly, representing a potential source of soil or groundwater contamination. The Other Physical Attributes Environmental Baseline Study (U.S. Army Corps of Engineers, Sacramento District 1992e) describes permitting requirements for wastewater discharge into storm drains.

Localized Source Areas. Other known or potential sources of hazardous and toxic waste at Fort Ord include volatile chlorinated compounds released from the Fort Ord industrial warehouse district and Fort Ord barracks; polychlorinated biphenyls from transformers historically stored in areas surrounding the East Garrison Defense Reutilization and Marketing Office; petroleum hydrocarbons, nitrates, and metals from the Ord Village sewage treatment plant; pesticides and fungicides in and around the Fort Ord Golf Course; and metals released in discharge of firearms and spent ammunition in Beach Trainfire Ranges (U.S. Army Corps of Engineers 1991a). Most of these sources are smaller and more localized than those described above under "Source Areas of Regional Concern".

Because Fort Ord was established in 1917, and a substantial amount of construction occurred from the 1940s to the 1960s, the majority of buildings on the installation likely contain some type of asbestos. The Army's policy is to remove and encapsulate friable asbestos, which is hazardous to human health; asbestos that is encapsulated or in good condition is not considered hazardous and will be left in place and its presence identified for the new owners or building managers.

The Army is conducting an asbestos study of approximately 4,500 buildings at Fort Ord. The survey report will include bulk sampling asbestos results, the location and condition of all material containing asbestos in each building, and recommendations for remediation or maintenance requirements.

Several buildings at Fort Ord also may contain lead-based paint or other lead contaminants. The Army will conduct onsite investigations, physical monitoring, and risk assessments to identify lead sources and recommend abatement measures. Lead abatement and disposal activities are regulated by Section 408 of the Toxic Substances Control Act Title IV, as amended by the Housing and Community Development Act in 1992.

4.10.4 Site Characterization and Remedial Investigations

The Superfund investigation activities being conducted by the Army are divided into installation-wide studies and site-specific source area evaluations. Installation-wide studies evaluate potential contaminant transport mechanisms; site-specific source area evaluations determine whether contamination is present in

potential source areas. Where contaminants are detected, further investigations determine their horizontal and vertical extent.

Installation-wide studies include hydrogeologic investigations to evaluate the direction and hydrodynamics of groundwater flow and identify groundwater contamination plumes, a surface water study to determine areas of surface water runoff and potential for runoff of contaminants from source areas to major surface water bodies, a sewer system study to evaluate the potential for contaminants to leak into the subsurface through storm drainage or sanitary sewer system piping, and a biological study to identify endangered species that potentially could be impacted by investigation or cleanup activities.

Figure 4.10-3 illustrates individual sites at Fort Ord identified by the Army as known or suspected hazardous waste sites after consultation with EPA, DTSC, and regional water quality control board representatives. Each site was placed into one of three categories by the Army RI/FS team: no further action, site characterization, or remedial investigation. Table 4.10-1 lists the status and proposed activity for each site.

4.10.4.1 Current Status of Remedial Investigation/Feasibility Studies

Ongoing Superfund investigations at Fort Ord are intended to supplement data collected from 15 individual sites and provide data for other newly identified areas of potential soil or groundwater contamination. During previous studies of the 15 sites and Operable Units 1 and 2, several hundred soil borings were drilled, over 100 monitoring wells were installed, and several hundred soil and groundwater samples were collected and analyzed. These data are summarized in the RI/FS work plan (U.S. Army Corps of Engineers 1991a).

The current status of RI/FS investigations is summarized below, and represents work activities conducted since fall 1991.

Installation-Wide Studies. Work completed to date in installation-wide investigations includes drilling pilot soil borings, collecting more than 100 soil samples from several surface and trenching locations, collecting more than 50 soil gas samples, installing groundwater monitoring well clusters, sampling several hundred monitoring wells, analyzing the groundwater chemistry, measuring water levels, conducting geophysical studies, and preparing reports summarizing the investigations. Further installation-wide activities will include preparing final reports, possibly installing additional monitoring wells, and conducting periodic sampling of new and existing monitoring wells.

Operable Units 1 and 2. Remediation activities at the former Fritzsche Army Airfield burn pit (Operable Unit 1 in Figure 4.10-3) have been in progress since 1988. Bioremediation activities to treat approximately 4000 cubic yards of excavated soil are complete. To date, approximately 23 million gallons of water have been pumped from groundwater extraction wells and treated in the Fritzsche Army Airfield soil and groundwater treatment system. Continued remediation and cleanup verification is required for Operable Unit 1.

Field investigations conducted at the Fort Ord landfill (Operable Unit 2 in Figure 4.10-3) include installing and sampling more than 40 groundwater monitoring wells, soil sampling in more than 40 locations, soil gas sampling in more than 130 locations, and conducting geophysical studies. Future activities include additional field investigations, preparing a feasibility study for remediation as part of the Superfund process, performing health risk assessments, and sampling new and existing groundwater monitoring wells.

Characterization Sites. Site characterizations are being conducted at 34 sites listed in Table 4.10-1. Fieldwork completed to date for these sites includes drilling five pilot soil borings; drilling 250 soil borings and collecting soil samples; collecting 200 soil gas samples; installing seven new groundwater

monitoring wells; sampling 30 new and existing monitoring wells; and performing geophysical, trenching, and soil gas investigations at four suspected landfills.

Table 4.10-1 Identified Investigation Sites for Hazardous Materials at Fort Ord, California

Site Number	Site Name	Status	Fiscal Year 93 Activity
1	Ord Village sewage treatment plant	Site characterization ongoing	Groundwater monitoring and site risk assessment
2	Main Garrison sewage treatment plant	Site characterization complete, remedial investigation ongoing	Proposed for operable unit 3 status
3	Beach trainfire ranges	No data	Site characterization ongoing
4	Beach stormwater outfalls	Investigation as part of basewide storm sewer study	Site deleted
5	Range 36A	Site characterization complete	Proposed for inclusion into site 39
6	Range 39 (abandoned car dump)	Site characterization complete	SEA ^a proposed
7	Range 40 and 41 (fire demonstration area)	No data	History review ongoing
8	Range 49 (Molotov cocktail range)	Limited soil data collected	SEA proposed
9	Range 39 (FFE training area)	Site characterization ongoing	Additional characterization, site proposed for inclusion in site 39
10	Burn pit	Site characterization complete	Soil SEA soil, additional groundwater characterization
11	Army and Air Force Exchange Service fueling station	Site characterization complete	SEA proposed
12	Lower meadow, Directorate of Logistics automotive yard, and parts salvage yard	Site characterization complete, remedial investigation ongoing	Proposed for operable unit 3 status
13	Railroad right-of-way	Site characterization complete	No further action
14	707th maintenance facility	Site characterization complete	Groundwater monitoring with a soil SEA
15	Directorate of Engineering and Housing yard	Site characterization complete	Additional pesticide characterization

Table 4.10-1 Continued

Site Number	Site Name	Status	Fiscal Year 93 Activity
16	Directorate of Logistics maintenance yard, Pete's Pond	Initial site characterization complete	Additional characterization of Pete's Pond required
17	1400 block motor pool	Site characterization ongoing	Additional landfill characterization required
18	1600 block motor pool	Site characterization complete	Soil SEA with groundwater monitoring
19	2200 block facility	Site characterization complete	Additional pesticide characterization
20	South parade grounds 3800 motor pool, and 519th motor pool	Site characterization complete at all three sites	Soil SEA with groundwater monitoring
21	4400/4500 motor pool, east block	Initial site characterization complete	Additional soil characterization
22	4400/4500 motor pool, west block	Site characterization complete	Soil SEA
23	3700 motor pool	Site characterization complete	Soil SEA
24	Old Directorate of Engineering and Housing yard	Site characterization complete	Additional pesticide characterization
25	Former Defense Reutilization and Marketing Office site	Site characterization complete	SEA ongoing
26	Sewage pump stations - Buildings 5871 and 6143	Site eliminated	No further action
27	Army Reserve motor pool	Site characterization complete, SEA complete	No further action
28	Barracks and main garrison area	Site characterization complete	SEA ongoing
29	Defense Reutilization and Marketing Office	Initial site characterization complete	Additional characterization with soil SEA
30	Driver training area	Site characterization complete	SEA ongoing
31	Former dump site	Initial characterization complete	Additional characterization
32	East Garrison sewage treatment plant	Site characterization complete	Groundwater monitoring with a SEA

Table 4.10-1 Continued

Site Number	Site Name	Status	Fiscal Year 93 Activity
33	Golf course	No data	Site characterization ongoing
34	Fritzsche Army Airfield fueling facility	Site characterization complete	SEA ^a proposed
35	Aircraft cannibalization yard	Initial site characterization complete	SEA ongoing
36	Fritzsche Army Airfield sewage treatment plant	Site characterization complete	SEA proposed
37	Trailer park maintenance shop	Site characterization complete, SEA complete	No further action
38	Army and Air Force Exchange Service dry cleaners	Site characterization and SEA complete	No further action
39	Impact area	Research ongoing	Additional characterization
40	RCRA/CERCLA integration	Research ongoing	Site identification and characterization
OU1	Operable Unit 1 Fritzsche Army Airfield Burn pit	Research ongoing	Remediation with cleanup verification
OU2	Operable Unit 2 Main landfill	RI/FS complete	FS review and finalization Proposed plan preparation

Notes:

^a SEA = site elimination action, as proposed by the Fort Ord Action Plan for Environmental Restoration Acceleration. Final action on all sites is subject to agency review and approval.

Installation-wide programs include background soil and groundwater investigation, installation-wide hydrogeologic characterization, installation-wide surface water investigation, installation-wide storm drainage and sanitary sewer system investigation, and installation-wide biological inventory.

Site characterization activities are conducted in accordance with the RI/FS work plan (U.S. Army Corps of Engineers 1991a).

Future activities planned for characterization sites include installing additional monitoring wells and soil borings, sampling new and existing monitoring wells, and removing contaminated soils. Interim data evaluation and recommendation reports will be prepared as necessary for these sites.

Remedial Investigation/Feasibility Study Sites. Remedial investigations are being conducted at five contaminated sites on the installation. Fieldwork completed to date for RI/FS sites includes drilling 39 soil borings; collecting 68 soil gas samples; installing 10 new groundwater monitoring wells and sampling

20 monitoring wells; drilling pilot soil borings and piezometers for measurement of groundwater levels; and conducting geophysical, trenching, and soil gas explorations at one suspected landfill.

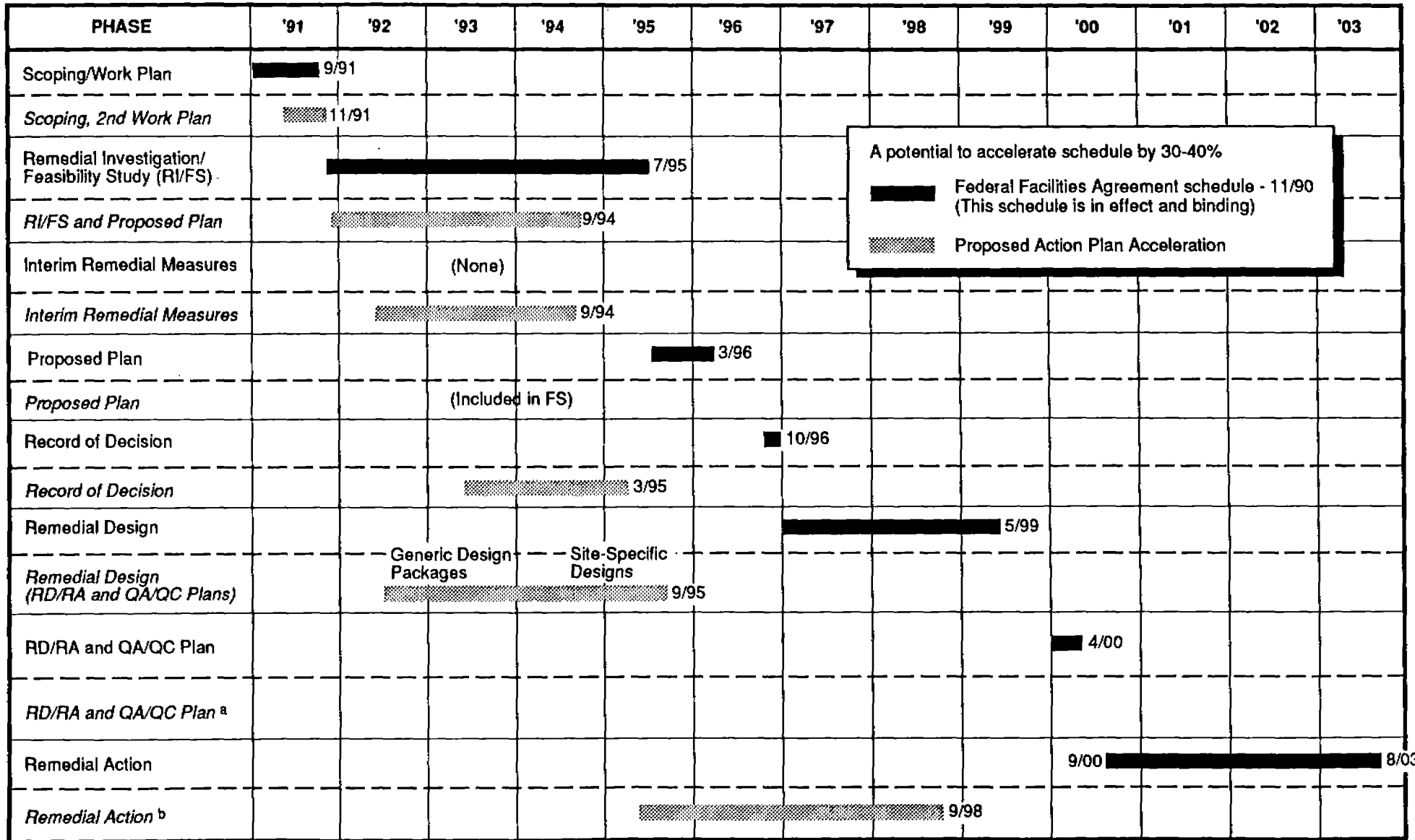
Future activities planned in conjunction with the RI/FS process include installing additional monitoring wells, pilot borings, and piezometers; sampling new and existing monitoring wells; removing contaminated soil; and conducting aquifer tests and treatability studies to perform feasibility studies. Interim data evaluation and recommendation reports and RI/FS reports will be prepared as necessary for these sites (U.S. Army Corps of Engineers pers. comm.).

Refer to Section 5.2.2, "Contaminated Sites", for a discussion of removal of unexploded ordnance.

4.10.4.2 Schedule for Completion of Remedial Action

The schedule for completing remedial actions at Fort Ord is presented in the federal facilities agreement. The installation developed an acceleration schedule in May 1991 to address base realignment and closure concerns. Figure 4.10-4 presents a comparison of the federal facilities agreement schedule and the proposed acceleration schedule. The acceleration schedule has not been formally negotiated or approved by the federal facilities agreement parties; the schedule presented in the federal facilities agreement is in effect and binding (U.S. Army Corps of Engineers, Sacramento District 1992g).

Comparison of Federal Facilities Agreement Schedule and Proposed Accelerated Schedule



4-93

Notes: RD/RA = Remedial Design/Remedial Action
QA/QC = Quality Assurance/Quality Control

^a These are incorporated in the RD/RA and QA/QC plans

^b Length of operation and monitoring of remedial actions is dependent upon types of contaminants and media type

Source: U.S. Army Corps of Engineers, Sacramento District, 1992f.

