Final

Record of Decision
Site 27 – Northern Channel

Former Naval Air Station Moffett Field
Santa Clara County, California

June 24, 2005

Prepared for:
Base Realignment and Closure
Program Management Office West
San Diego, California

Prepared under:
Naval Facilities Engineering Command
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Contract Task Order 023

DS.B023.13909

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ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COEC	Chemical of ecological concern
DDT	Dichlorodiphenyltrichloroethane
EPA	U.S. Environmental Protection Agency
Lockheed	Lockheed Martin Corporation
mg/kg	Milligrams per kilogram
NAS	Naval Air Station
PCB	Polychlorinated biphenyl
PRG	Preliminary remediation goal
SWEA	Site-wide ecological assessment

DECLARATION STATEMENT FOR SITE 27 – NORTHERN CHANNEL AND RELATED AREAS

SITE NAME AND LOCATION

Site 27 – Northern Channel and Related Areas
Former Naval Air Station Moffett Field
National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035
EPA CERCLIS ID Number CA2170090078

STATEMENT OF BASIS AND PURPOSE

This Record of Decision document presents the selected remedy for Site 27, which includes the Northern Channel and related areas, at the former Naval Air Station Moffett Field. The related areas are defined as the Patrol Road Ditch, North Patrol Road Ditch, Marriage Road Ditch, the berms on either side of the Northern Channel, and the debris pile area located near the Building 191 lift station. Ownership of the Northern Channel and related areas within Site 27 is divided among the National Aeronautics and Space Administration, Lockheed Martin Corporation, U.S. Fish and Wildlife Service, Santa Clara Valley Water District, Cargill Salt, and the City of Sunnyvale. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is supported by information contained in the Administrative Record for Site 27, the Northern Channel and related areas. The U.S. Environmental Protection Agency and the State of California, through the San Francisco Bay Regional Water Quality Control Board, concur with the selected remedy. This Record of Decision also includes a responsiveness summary, which describes the public participation conducted and provides responses to comments received during the public comment period.

ASSESSMENT OF THE SITE

The selected remedy in this Record of Decision is necessary to protect the public health and welfare and the environment from actual or threatened releases of pollutants, contaminants, or hazardous substances from the site.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy will address direct contact between sediments and environmental receptors through excavation and off-site disposal of sediments and soils containing the following chemicals of ecological concern.

- Total polychlorinated biphenyls (the sum of Aroclor-1254 and Aroclor-1260)
- Total dichlorodiphenyltrichloroethane (the sum of 4,4-dichlorodiphenyltrichloroethane, 4,4-dichlorodiphenyldichloroethane, and 4,4-dichlorodiphenyldichloroethene)
- Total chlordane (the sum of alpha- and gamma-chlordane)
- Cadmium
- Lead
- Mercury
- Selenium
- Silver
- Zinc

These chemicals were identified as the primary chemicals driving risk to ecological receptors at Site 27. In addition, all of these chemicals were detected in sediment at concentrations exceeding their respective cleanup goals except for total chlordane. Total polychlorinated biphenyls consisted of Aroclor-1254 and Aroclor-1260 because no other Aroclors were detected and the congener-specific data did not support the presence of other Aroclors in the Northern Channel or related areas. The Navy is addressing total dichlorodiphenyltrichloroethane and total chlordane as part of the selected remedy at Site 27 because these chemicals are the result of runoff from other areas. The following sediment cleanup goals were established for each chemical of ecological concern to protect sensitive ecological receptors:

- Total Polychlorinated Biphenyls: 0.35 milligrams per kilogram (mg/kg) (or 350 micrograms per kilogram)
- Total Dichlorodiphenyltrichloroethane: 0.0648 mg/kg (or 64.8 micrograms per kilogram)
- Total Chlordane: 0.931 mg/kg (or 931 micrograms per kilogram)
- Cadmium: 184 mg/kg
- Lead: 173 mg/kg
- Mercury: 1.52 mg/kg
- Selenium: 0.926 mg/kg
- Silver: 13.7 mg/kg
- Zinc: 720 mg/kg

Additionally, residential preliminary remediation goals were identified as cleanup goals for soil in the berms for each chemical below (U.S. Environmental Protection Agencies 2004).

- Total Polychlorinated Biphenyls: 0.22 mg/kg (or 220 micrograms per kilogram)
- Dichlorodiphenyldichloroethane: 2.4 mg/kg (or 2,400 micrograms per kilogram); Dichlorodiphenyldichloroethene: 1.7 mg/kg (or 1,700 micrograms per kilogram; Dichlorodiphenyltrichloroethane: 1.7 mg/kg (or 1,700 micrograms per kilogram)
- Total Chlordane: 1.6 mg/kg (or 1,600 micrograms per kilogram)
- Cadmium: 37 mg/kg
- Lead: 150 mg/kg (California-modified preliminary remediation goal)
- Mercury: 23 mg/kg
- Selenium: 390 mg/kg
- Silver: 390 mg/kg
- Zinc: 23,000 mg/kg

The selected remedy for Site 27 is consistent with the findings of the remedial investigation and feasibility study and complies with the basewide management strategy to accelerate remedial actions at operable units while identifying and closing out sites that do not require action. The selected remedy includes confirmation sampling to ensure that sediments containing chemicals at concentrations above sediment and soil cleanup goals are removed.

The major components of the selected remedy include:

- Excavating sediment in areas where concentrations of chemicals of ecological concern exceed cleanup goals considered safe for birds such as the great blue heron and the black-necked stilt, which are considered the most sensitive ecological receptors likely to be present in the Northern Channel and related areas, given site uses.

- Excavating sediment from the debris pile and soil from portions of the berms along the Northern Channel.

- Transporting excavated sediments off site to an appropriate disposal facility.

- Collecting confirmation samples in the excavation sidewalls to ensure that sediment and soil exceeding the cleanup goals was removed in accordance with the guidelines established in this Record of Decision.

- Restoring Site 27 by (1) backfilling selected areas of the Northern Channel and ditches as needed to maintain the hydrologic conditions (2) backfilling the excavated areas of the berms with clean soil (free from contaminants), and (3) revegetating the berms with plants native to California.

The excavation will extend according to the following limits:

- Contaminated sediments from the entire length of the Northern Channel.
- Contaminated sediments from the debris pile.
- Contaminated soil from (1) the western end of the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191, and (2) the Lockheed Martin Corporation berm near the eastern end of the Northern Channel.
- Contaminated sediments from the entire length of the North Patrol Road Ditch.
- Contaminated sediments from approximately a 1,700-foot length of the Marriage Road Ditch.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state applicable or relevant and appropriate requirements, and is cost-effective. The selected remedy does not satisfy the statutory preference for treatment as a principal element. Uncertainty about the effectiveness of the biotreatment techniques for the specific organic compounds present at Site 27, and the essentially "untreatable" nature of the metals, precluded selection of a remedy that would treat contaminants effectively. Therefore, the reasonably available treatment technologies would not adequately reduce the toxicity level of the chemicals of ecological concern in sediment at Site 27. The U.S. Department of the Navy, U.S. Environmental Protection Agency, and the San Francisco Bay Regional Water Quality Control Board have determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be used in a cost-effective manner. A five-year review will not be required under the selected remedy because no contamination will be left in place at concentrations that would require institutional controls to restrict land use.

RECORD OF DECISION CERTIFICATION CHECKLIST

The following information is included in this Record of Decision:

- Chemicals of ecological concern and their concentrations (see Section 5.0)
- Baseline risk represented by the chemicals of ecological concern (see Section 7.0)
- Cleanup goals established for the chemicals of ecological concern and the basis for these levels (see Section 7.0)
- How source materials that constitute principal threats are addressed (see Section 5.0)

- Current and reasonably anticipated future land-use assumptions considered in the baseline risk assessment and this Record of Decision (see Section 6.0)
- Potential land use that will be available at the site due to the selected remedy (see Section 12.0)
- Estimated capital, total operation and maintenance, total and current worth costs, discount rate, and the number of years over which the costs of the remedy are projected (see Section 10.0)
- Key factors that led to selecting the remedy (see Section 12.0)

Additional information can be found in the Administrative Record for Site 27; Appendix A provides an index of the Administrative Record for Site 27.

AUTHORIZING SIGNATURES

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Base Realignment and Closure Environmental Coordinator
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23 June 2005
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Date

Bruce H. Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board

Date

1.0 SITE NAME, LOCATION, AND DESCRIPTION

This section summarizes the site, including the name and location of the site, U.S. Environmental Protection Agency (EPA) identification number, lead and support agencies, source of cleanup monies, site type, site description, and site ownership.

1.1 SITE NAME AND LOCATION

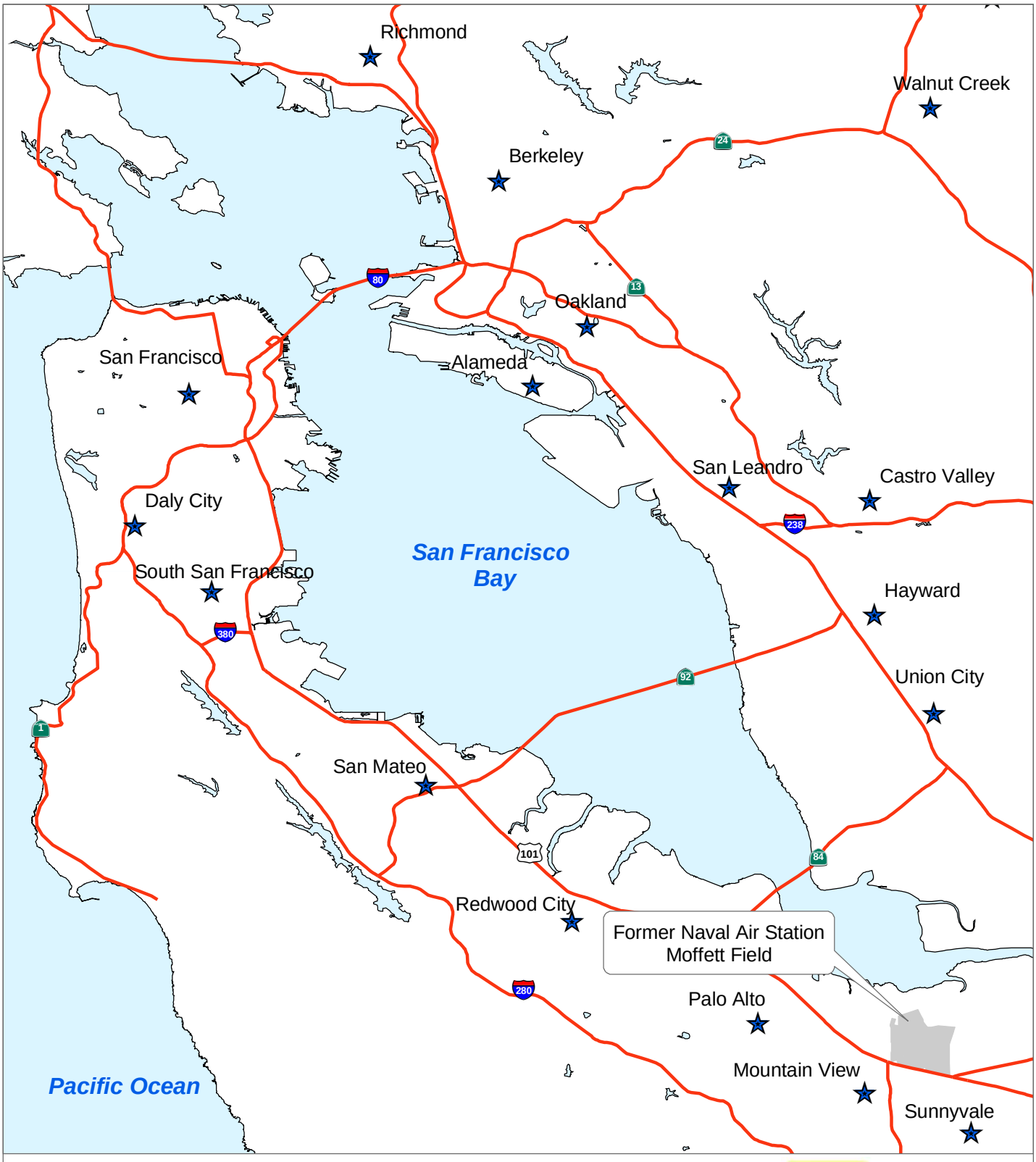
This Record of Decision addresses Site 27, which includes the Northern Channel and related areas, at the former Naval Air Station (NAS) Moffett Field in California. The former NAS Moffett Field is located near the southern edge of San Francisco Bay in Santa Clara County. Figure 1 is the regional location map. The former NAS Moffett Field is bounded by the U.S. Fish and Wildlife Service Diked Ponds (formerly the Cargill Evaporation Ponds, owned by Cargill Salt) to the north, Stevens Creek and the Midpeninsula Regional Open Space District's property to the west, U.S. Highway 101 to the south, and the Lockheed Martin Corporation (Lockheed) to the east. The cities of Mountain View and Sunnyvale, California, also border the former NAS Moffett Field. Sunnyvale is located southeast of Mountain View, and both cities are adjacent to the southern portion of the former NAS Moffett Field. Site 27 includes the Northern Channel and related areas, which are defined as the Patrol Road Ditch, North Patrol Road Ditch, Marriage Road Ditch, the berms on either side of the Northern Channel, and the debris pile area located near the Building 191 lift station. Figure 2 shows the location of Site 27.

1.2 U.S. ENVIRONMENTAL PROTECTION AGENCY IDENTIFICATION NUMBER

The EPA's Comprehensive Environmental Response, Compensation, and Liability Information System identification number for the former NAS Moffett Field is CA2170090078.

1.3 LEAD AND SUPPORT AGENCIES

The lead agency for activities conducted at this site is the U.S. Department of the Navy (hereafter referred to as the "Navy"). The lead regulatory agency is EPA. The supporting regulatory agency is the San Francisco Bay Regional Water Quality Control Board. Environmental investigation and restoration at the former NAS Moffett Field, and specifically at Site 27, are conducted under the Navy's Installation Restoration Program. The Installation Restoration Program was developed in 1980 by the U.S. Department of Defense to comply with federal guidelines to manage and control past waste disposal actions. Installation Restoration Program activities are carried out under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, and with the National Oil and Hazardous Substances Pollution Contingency Plan, also known as the "Superfund" program.



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Former Naval Air Station Moffett Field, California

Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 1

FACILITY LOCATION MAP

Record of Decision
Site 27 - Northern Channel

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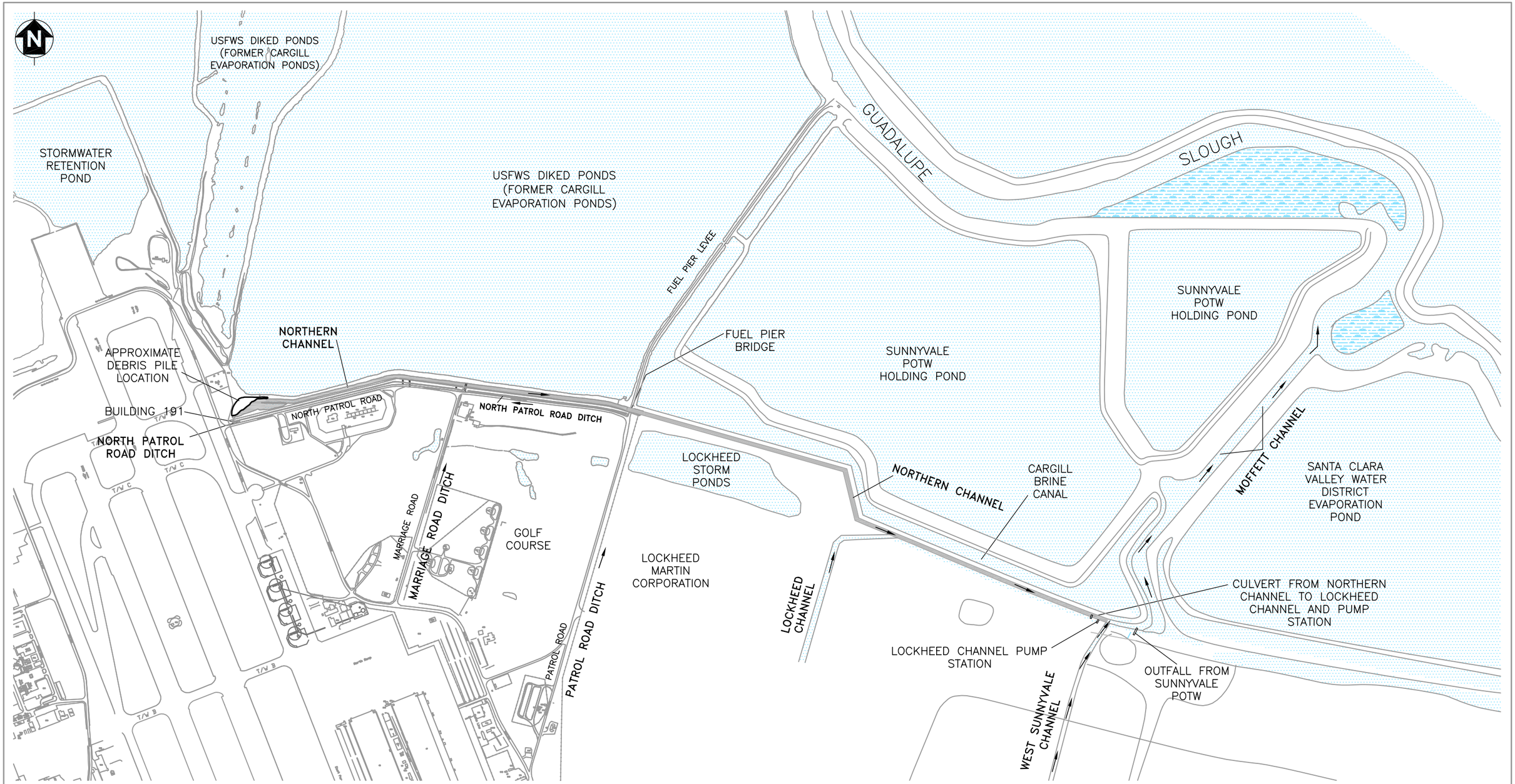

DIRECTION OF FLOW

SURFACE WATER

MARSH LAND

Notes:
POTW Publicly owned treatment works
USFWS U.S. Fish and Wildlife Service

500 0 500 1,000
Scale: 1" = 1,000'

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Former Naval Air Station Moffett Field
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 2
SITE LOCATION MAP

Record of Decision
Site 27 - Northern Channel

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1.4 SOURCE OF CLEANUP MONIES

Funding for environmental investigation and remediation conducted under the Installation Restoration Program is provided by the Navy.

1.5 SITE TYPE

Site 27 includes most of the stormwater management system for the eastern half of the former NAS Moffett Field associated with each of the individual waterways.

1.6 SITE DESCRIPTION

Site 27 includes the Northern Channel, related ditches that drain into the Northern Channel, the berms along either side of the Northern Channel, and the debris pile near the Building 191 lift station. The Northern Channel is located near the northeastern boundary of the former NAS Moffett Field (see Figure 2). Historically, the Northern Channel has received stormwater runoff from the former NAS Moffett Field and National Aeronautics and Space Administration Ames Research Center. Portions of the Northern Channel that are owned by Lockheed, Cargill Salt, and the Santa Clara Valley Water District extend eastward, approximately 5,500 feet beyond the boundary of the former NAS Moffett Field, and are also included within this Record of Decision (see Figure 2). The areas that make up Site 27 are summarized below; detailed descriptions of the areas are provided in the "Northern Channel Feasibility Study (Site 27)" (Tetra Tech EM Inc. 2003).

- **Northern Channel and Berms.** Nearly 2 miles long, the Northern Channel receives stormwater from the eastern portion of the former NAS Moffett Field. Water in the channel flows east, approximately 1 mile beyond the boundary of the former NAS Moffett Field into Lockheed Channel. The Northern Channel flows by gravity at this termination point through a pipe to the terminus of the Lockheed Channel, which runs parallel to the eastern end of the Northern Channel. The two channels are separated by a levee. Water from the terminus of Lockheed Channel is pumped into the Moffett Channel, which drains into Guadalupe Slough and eventually into San Francisco Bay. The Northern Channel provides brackish surface water habitat of moderate value to wildlife. The surface area of the channel is about 9 acres; its bottom substrate is sediment, and the banks are fill material. The width of the channel is 40 to 50 feet, but increases to 70 feet at the western end; the channel is about 10,000 feet long, and the bottom of the channel lies approximately 2.8 feet below mean sea level. The north levee is made of compacted hard clay and is approximately 5 feet high (above the water level in the channel), with flat surfaces and steep side slopes. The slopes of the bank are moderately eroded with loose surface material that supports a moderate amount of plants. The south levee is also made of compacted clays and supports a greater diversity of vegetation. Wildlife surveys have detected the presence of the western pond turtle, various plants, and a wide variety of shore birds and waterfowl in the area.

- **Marriage Road Ditch.** Located east of the runways, Marriage Road Ditch divides the golf course at the former NAS Moffett Field. The ditch extends about 2,300 feet, and the bottom of the ditch is 5 to 6 feet below mean sea level. Water flowing in Marriage Road Ditch is perennial and portions of the ditch are lined with concrete. Surface water from the east apron area and from the storm drains in and around Hangars 2 and 3 discharges into the ditch. Marriage Road Ditch receives additional runoff from the southern two-thirds of the runways and the golf course east and west of the ditch. Surface water from Marriage Road Ditch drains into North Patrol Road Ditch. During the rainy season, surface water from Marriage Road Ditch is occasionally pumped directly into the Northern Channel to prevent flooding during storms. The probable source of contamination in Marriage Road Ditch is historical surface water runoff from storm drains. These storm drains collected runoff from the paved and unpaved areas around Hangars 2 and 3 and conveyed it to Marriage Road Ditch. The ditch provides habitat for insects, worms, snails, and the western pond turtle. Several species of plants grow in and along the sides of the ditch.

- **Patrol Road Ditch.** Patrol Road Ditch (also known as the East Patrol Road Ditch) is a surface drainage feature that runs 2,100 feet along the eastern boundary of the former NAS Moffett Field; the bottom of the ditch is about 5 to 6 feet below mean sea level. The ditch is part of the storm drain system at the former NAS Moffett Field. Its flow in the southern end is intermittent and depends on rainfall. The northern end of the ditch receives regular runoff from irrigation of the golf course and contains water year round. Surface water from Patrol Road Ditch flows into North Patrol Road Ditch through a culvert during periods of high water; water from the ditch is occasionally pumped directly to the Northern Channel during winter rainstorms. The probable source of contamination is surface water runoff into the storm drains that feed into Patrol Road Ditch. During the wet season, the northern end of the ditch provides open water and emergent vegetation. During the dry season, the southern end consists of habitat similar to upland areas. Several species of birds have been identified in Patrol Road Ditch.

- **North Patrol Road Ditch.** This ditch runs 4,300 feet along the North Patrol Road, parallel to and south of the Northern Channel. The western portion of the ditch is lined with concrete, lies about 5 to 6 feet below mean sea level, and generally contains water year-round. The North Patrol Road Ditch carries surface water from east to west toward the Building 191 lift station. The North Patrol Road Ditch is an integral part of the storm drain system at Moffett. North Patrol Road Ditch receives stormwater from Marriage Road Ditch, Patrol Road Ditch, and the golf course. Surface water flow through the North Patrol Road Ditch is intermittent and depends on rainfall. The banks of the ditch are defined and are made of fill material and emergent vegetation but represent poor wetland habitat. Species observed here include ducks, doves, burrowing owls, and squirrels.

- **Debris Pile.** The debris pile is located north of the Building 191 lift station at the western end of the Northern Channel, between the north bank of the channel and south bank of the U.S. Fish and Wildlife Service Diked Ponds. The pile consists of about 10,000 cubic yards of dredged sediment from the Northern Channel and construction debris from the 1950s to 1990s.

The following chemicals of ecological concern are present in sediment from the Northern Channel and related areas:

- Total polychlorinated biphenyls (the sum of Aroclor-1254 and Aroclor-1260)
- Total dichlorodiphenyltrichloroethane (the sum of 4,4-dichlorodiphenyltrichloroethane, 4,4-dichlorodiphenyldichloroethane, and 4,4-dichlorodiphenyldichloroethene)
- Total chlordane (the sum of alpha- and gamma-chlordane)
- Cadmium
- Lead
- Mercury
- Selenium
- Silver
- Zinc

Total polychlorinated biphenyls consisted of the sum of Aroclor-1254 and Aroclor-1260 because no other Aroclors were detected and the congener-specific data did not support the presence of other Aroclors in the Northern Channel or related areas.

1.7 OWNERSHIP

Ownership of the Northern Channel and related areas within Site 27 is divided among National Aeronautics and Space Administration, Lockheed, U.S. Fish and Wildlife Service, Santa Clara Valley Water District, Cargill Salt, and the City of Sunnyvale. National Aeronautics and Space Administration owns the southern berm along the northern boundary of the former NAS Moffett Field and a portion of the property where the debris pile is located. In addition, National Aeronautics and Space Administration owns the Marriage Road Ditch, the Patrol Road Ditch, and the North Patrol Ditch. Lockheed owns the southern berm along the northern boundary of its property and a small portion of the Northern Channel. Cargill Salt owns the remainder of the berm, the Northern Channel, and the remainder of the area where the debris pile is located. U.S. Fish and Wildlife Service purchased the saltwater evaporation ponds adjacent to Site 27 from Cargill Salt in 2003. The City of Sunnyvale owns ponds and a publicly owned treatment works located near the eastern end of the Northern Channel. In addition, Sunnyvale leases a portion of the berms for hiking and biking trails. Figure 2 showed the general areas associated with each property owner.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The former Naval Air Station (NAS) Moffett Field was operated by the Navy from 1933 to 1935 and again from 1942 to 1994. The U.S. Army Air Corps operated the facility from 1935 to 1942. The facility initially supported the West Coast airships of the lighter-than-air program and later was used in various aviation-related capacities, which included transport, training, and anti-submarine patrol activities. The former NAS Moffett Field was closed as an active military base in July 1994. National Aeronautics and Space Administration Ames Research Center, a research and development facility, now operates the former NAS Moffett Field, except for the military housing area that is operated by the U.S. Army.

Environmental restoration began at the former NAS Moffett Field in 1984 as part of the Navy's Installation Restoration Program. The Navy conducted an initial assessment study to gather data on past use and disposal of hazardous materials (Naval Energy and Environmental Support Activity 1984). Nineteen sites were identified as potential sources of wastes, including 9 sites identified in the initial assessment study and 10 sites added during subsequent investigations in 1986 and 1987. U.S. Environmental Protection Agency proposed that NAS Moffett Field be included on the National Priorities List in June 1986, and placed it on the National Priorities List in 1987. Placement on the National Priorities List initiated the remedial investigation and feasibility study process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Data collected during the initial studies were used to plan the remedial investigations and feasibility studies. This work was coordinated through a Federal Facility Agreement that involved the Navy, U.S. Environmental Protection Agency, California Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board, which was signed on September 14, 1990. The Federal Facility Agreement is a cooperative agreement that:

- Assures that environmental impacts are investigated and appropriate response actions are taken to protect human health and the environment
- Establishes a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions
- Facilitates cooperation, exchange of information, and participation of the parties
- Ensures adequate assessment, prompt notification, and coordination between federal and state agencies

Sites included under the CERCLA program at the former NAS Moffett Field were organized into operable units in 1991. Site 27 is considered part of Operable Unit 6. In December 1999, Operable Unit 6 was defined as wetland areas, stormwater retention ponds, and storm channels (Tetra Tech EM Inc. 1999b). Information on the history of the Northern Channel is incomplete. In the early 1900s, several artificial channels were built in the southern portion of San Francisco Bay for navigation. It is possible that the Northern Channel was built for this purpose; however,

its construction may have been associated with development of the former saltwater evaporation pond system that now encircles the southern portion of San Francisco Bay.

Plans dated 1932 for the sewer and stormwater system at the former NAS Moffett Field identify the Northern Channel as a "Tidewater Channel," drained by gravity to San Francisco Bay. The Northern Channel is not currently in direct communication with the marine environment of the bay, but terminates about 1 mile east of the eastern boundary of the former NAS Moffett Field (see Figure 2). Regional land subsidence caused by groundwater overdrafts between the 1950s and 1970s may have necessitated the present use of pumps to convey water from the Northern Channel and Lockheed Channel into the bay.

Maps from 1932 indicate that the Northern Channel received direct inputs from the former Lindbergh Avenue Ditch, which was the original stormwater drainage system at the former NAS Moffett Field. The 1932 maps also indicate that the Northern Channel received direct inputs from a former septic tank system at the facility. There are also indications that the Northern Channel received inputs of treated water from a wastewater treatment facility at the former NAS Moffett Field. In the 1950s the runways were extended and the stormwater drainage system was modified. Surface water from the eastern portion of the site, including the runways and aircraft aprons, now drains through a system of surface channels and a subsurface drain under the runways to the Building 191 lift station where it is pumped into the western end of the Northern Channel.

Marriage Road Ditch is located east of the runways and divides the golf course (see Figure 2). Constructed in the 1940s, Marriage Road Ditch was part of the eastern expansion at the former NAS Moffett Field. Stormwater from this ditch discharges to the North Patrol Road Ditch. Patrol Road Ditch is a surface drainage feature that receives a portion of stormwater flow from the area of the base east of Macon Road, the fuel farm area (Site 5), and the portion of the golf course east of Marriage Road Ditch (see Figure 2). Constructed in 1933, Patrol Road Ditch is an unlined 2,100-foot-long ditch on the eastern boundary of the former NAS Moffett Field. Surface water from Patrol Road Ditch flows into North Patrol Road Ditch through a culvert during periods of high water; water from the ditch is occasionally pumped directly to the Northern Channel during winter rainstorms. North Patrol Road Ditch, historically referred to as the "Navy Ditch," is located south of and parallel to the Northern Channel (see Figure 2). Constructed in 1933, the North Patrol Road Ditch is 4,300 feet long; the western portion of the ditch is lined with concrete. Stormwater from this ditch flows to the Building 191 pump station and is then discharged to the North Channel.

From 1992 to 2002, the Navy conducted a number of environmental studies, including a site-wide ecological assessment in two phases (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a, 1997). The ecology and nature and extent of contamination at Site 27 were evaluated during these investigations. Potential risks to ecological receptors from contaminated sediments were identified in the station-wide remedial investigation (PRC Environmental Management, Inc. 1996) and the final Phase II site-wide ecological assessment (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). In addition, the station-wide remedial investigation also included a human health risk assessment (PRC

Environmental Management, Inc. 1996). Final and revised final station-wide feasibility study reports were prepared in October 1998 and September 1999, respectively. These documents concluded, however, that the Northern Channel and related areas would no longer be evaluated in the station-wide feasibility study because of its unique characteristics. The physical characterization study for the Northern Channel provided additional information on contamination found in the Northern Channel (Montgomery Watson, Inc. 2000). However, further work indicated a number of data gaps associated with the Northern Channel and related areas. In addition, no data for soil or sediment were collected from either the berms or the debris pile area. Therefore, a data gaps investigation was conducted in May 2002 to collect additional data to complete a feasibility study for the Northern Channel and related areas. The final feasibility study for the Northern Channel and related areas was completed in November 2003 (Tetra Tech EM Inc. 2003).

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

In May 1989, the Navy developed a community relations plan for the former Naval Air Station Moffett Field. The community relations plan outlined specific activities based on environmental concerns voiced by the community. Since 1993, the U.S. Environmental Protection Agency has provided a technical assistance grant to the Silicon Valley Toxics Coalition, a local environmental group. This grant allows Silicon Valley Toxics Coalition to hire a consultant to assist in reviewing environmental documents for the former Naval Air Station Moffett Field. In addition, the Navy formed a technical review committee in 1989, which met quarterly to discuss environmental progress at Site 27. The technical review committee evolved in 1994 into what is now known as the Restoration Advisory Board. The Restoration Advisory Board is made up of members of the technical review committee and the community and holds regular public meetings to discuss environmental progress at the former Naval Air Station Moffett Field.

The remedial investigation report, site-wide ecological assessment report, feasibility study report, proposed plan, and all other documents related to Site 27 can be obtained through the Administrative Record located at Naval Facilities Engineering Command, Southwest Division, 937 North Harbor Drive, Building 1, 3rd Floor, San Diego, California, 92132-5190, and at the Information Repository located at the Mountain View Public Library, 585 Franklin Street, Mountain View, California 94041. An index of the Administrative Record is included as Appendix A.

A public review and comment period for the Site 27 proposed plan was held from May 4, 2004, to June 4, 2004, with a public meeting held on May 20, 2004 (Navy 2004). Representatives from the Navy, U.S. Environmental Protection Agency, and San Francisco Bay Regional Water Quality Control Board answered questions at this meeting, and supplied the rationale for proposing the selected remedy for the Northern Channel and related areas. The public meeting transcript and the Navy responses to comments received during the public meeting and during the public comment period are included in Appendix B, Public Meeting Transcript and Responsiveness Summary, of this Record of Decision. These community participation activities fulfill the requirements of Sections 113(k)(2)(B)(i-v) and 117(a)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act.

No socioeconomic and community revitalization impacts are anticipated as a result of the remedial action because the current site use, stormwater management, will remain the same. Anticipated environmental and ecological benefits include removing sediment and soil in areas where chemical concentrations exceed the cleanup goals considered safe for the most sensitive ecological receptors and revegetating disturbed areas with plants native to California.

4.0 SCOPE AND ROLE OF SITE 27 WITHIN THE BASEWIDE STRATEGY

Former Naval Air Station Moffett Field is a federal facility that contains contaminated sites and potential sources of contamination, which have been identified through various environmental assessments and investigations over the last 15 years. The lead agency for these activities is the Navy, with regulatory oversight by the U.S. Environmental Protection Agency and the San Francisco Bay Regional Water Quality Control Board. The sites investigated under the Comprehensive Environmental Response, Compensation, and Liability Act program have been organized into operable units or other sites as follows:

- Operable Unit 1: Soil and groundwater at Sites 1 and 2 landfills
- Operable Unit 2-East: Soil at Sites 3, 4, 6, 7, 10 (runways), 11, and 13
- Operable Unit 2-West: Soil at Sites 8, 10 (Chase Park), 14-North, 16, 17, and 18
- Operable Unit 5: Aquifers on the eastern side of former Naval Air Station Moffett Field that are not part of the regional plume or Operable Unit 1
- Operable Unit 6: Wetland areas, including Sites 25 and 27
- Petroleum Sites: Sites 5, 9, 12, 14-South, 15, 19, 20, and 24
- Additional Sites: Site 21, Site 22, Site 23, Site 29, weapons storage bunkers, former industrial wastewater flux ponds, and the abandoned former agricultural well

This Record of Decision addresses Site 27, which includes the Northern Channel, Patrol Road Ditch, North Patrol Road Ditch, and Marriage Road Ditch; the debris pile near Building 191 lift station; and the berms along the Northern Channel. The selected remedy described in this Record of Decision will reduce risk associated with exposure to contaminated sediments within the Northern Channel, North Patrol Road Ditch, Marriage Road Ditch, and the debris pile. The Patrol Road Ditch does not require remediation because chemical concentrations in sediment were below cleanup goals. Additionally, this Record of Decision addresses contaminated soil present in the berms along the Northern Channel at concentrations greater than residential preliminary remediation goals (U.S. Environmental Protection Agency 2004) that are protective of human health. The selected remedy will be implemented when the regulatory agencies concur with the remedial design and implementation work plan.

Selection of the remedy for the Northern Channel and related areas within Site 27 is consistent with overall remedial investigation and feasibility study activities at the former Naval Air Station Moffett Field.

5.0 SUMMARY OF SITE CHARACTERISTICS

This section summarizes the geology, hydrogeology, surface water, topological features, ecology, archaeologically and historically important information, and nature and extent of contamination for Site 27, including the Northern Channel and the related areas, at the former Naval Air Station (NAS) Moffett Field. The summary is based on information gathered during station-wide remedial investigations, ecological risk assessments, and the data gaps investigation that focused on the Northern Channel and related areas. Additional information can be found in the station-wide remedial investigation (PRC Environmental Management, Inc. 1996), the Phase II site-wide ecological assessment (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997), the physical characterization report for the Northern Channel (Montgomery Watson, Inc. 2000), and the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. [Tetra Tech] 2003).

5.1 GEOLOGY

The former NAS Moffett Field is located at the northern end of the Santa Clara Valley Basin, approximately 1 mile south of the San Francisco Bay (see Figure 1). The shallow geology of the former NAS Moffett Field consists of alluvial, fluvial, and estuarine deposits (Iwamura 1980). The fluvial deposits were derived from the Santa Cruz highlands west of the basin and deposited on an alluvial plain bounded by alluvial fan deposits to the west and baylands to the northeast (Iwamura 1980). The heterogeneous nature of the channel and inter-channel sediments deposited in the fluvial depositional environment is evident in the many subsurface explorations conducted at the former NAS Moffett Field.

5.2 HYDROGEOLOGY

Groundwater is encountered in silt, sand, and gravel deposits in the shallow subsurface at Site 27. The first saturated interval is often confined, and the groundwater piezometric surface is at or just below ground surface at Site 27 (Tetra Tech EM Inc. 1999b; PRC Environmental Management, Inc. 1995). Coarse-grained deposits readily produce groundwater, whereas fine-grained silts yield much smaller volumes of water (Driscoll 1986; Fetter 1988). The first saturated zone is classified as the A-aquifer at the former NAS Moffett Field. This aquifer extends from just below the ground surface to about 65 feet below the ground surface. Aquifer materials within the A-aquifer range from clays and silts to fine- and medium-grained sands with some coarse-grained gravels (PRC Environmental Management, Inc. and James M. Montgomery Consulting Engineers, Inc. 1992).

Other aquifers below the A-aquifer produce greater amounts of water than the A-aquifer. Continuous and discontinuous aquitards divide the aquifers and aquifer zones. The descriptions of the aquifers and aquitards are based on existing data and lithologic interpretation of soil borings and cone penetrometer tests, as discussed in the 2001 annual groundwater report for the West-Side Aquifers Treatment System and the East-Side Aquifers Treatment System (Tetra Tech FW, Inc. 2003), the "Final Feasibility Study Report for Operable Unit 1" (PRC Environmental Management, Inc. 1995), the "Site 22 Revised Final Feasibility Study Report" (Tetra Tech EM

Inc. 1999a), and the technical memorandum on the geology and hydrogeology of the former NAS Moffett Field (PRC Environmental Management, Inc. and James M. Montgomery Consulting Engineers, Inc. 1992). Of these deeper aquifers, the C-aquifer has historically been used for agricultural purposes in the area that makes up the former NAS Moffett Field. However, no production wells are currently operated at the former NAS Moffett Field. Production wells are defined as wells producing water for beneficial uses such as agricultural or municipal water supply. Groundwater in the C-aquifer is a source of drinking water elsewhere in the Santa Clara Valley (PRC Environmental Management, Inc. and James M. Montgomery Consulting Engineers, Inc. 1992).

The water table at Site 27 fluctuates in response to changes in evapotranspiration rates and infiltrations of precipitation runoff. The first saturated zone is encountered at 1 to 5 feet below ground surface. Tidal influence on the elevation of the water table is negligible. Shallow groundwater of the A-aquifer does not meet water quality criteria identified in State Water Resources Control Board Resolution 88-63 because concentrations of total dissolved solids in groundwater exceed 3,000 milligrams per liter. Shallow groundwater at Site 27 does meet less stringent water quality criteria presented in U.S. Environmental Protection Agency classification guidelines for a potential source of drinking water because concentrations of total dissolved solids are less than 10,000 milligrams per liter across at least part of the site.

5.3 SURFACE WATER

San Francisco Bay is approximately 1 mile north of the former NAS Moffett Field (see Figure 1). Historically, tidal salt marshes and mud flats covered extensive areas of the southern portion of the bay, including the northern portion of the former NAS Moffett Field (PRC Environmental Management, Inc. 1996). However, most of these wetlands have been eliminated or greatly altered. The large area north and northeast of the former NAS Moffett Field was diked more than 50 years ago and was used as commercial saltwater evaporation ponds (PRC Environmental Management, Inc. 1996). In 2003, Cargill Salt, the former owner of the ponds, transferred the ponds to U.S. Fish and Wildlife Service.

Surface water features at the former NAS Moffett Field include stormwater drainage ditches, small ponds maintained on the golf course, the Stormwater Retention Pond, and the Northern Channel. There are no natural streams at the former NAS Moffett Field, although streams are present east and west of the facility. Coyote Creek and Guadalupe Slough drain into San Francisco Bay east of the facility, and Stevens Creek drains into San Francisco Bay to the west.

Stormwater in the western portion of the former NAS Moffett Field drains to a settling basin via underground conduits. The water flows overland from the settling basin northward through the Eastern Diked Marsh to the stormwater retention pond. Stormwater in the eastern portion of the former NAS Moffett Field (including the runways and aircraft aprons) drains through a system of surface channels, including the North Patrol Road Ditch, Marriage Road Ditch, and Patrol Road Ditch, and through subsurface conduits to a subsurface drain at the Building 191 lift station. The lift station pumps water into the western end of the Northern Channel (see Figure 2). During

significant rainfall, temporary lift stations pump water from North Patrol Road Ditch directly into the Northern Channel (Tetra Tech EM Inc. 2003).

Water in the Northern Channel flows east by gravity approximately 1 mile beyond the boundary of the former NAS Moffett Field and empties into the Lockheed Martin, Corporation (Lockheed) Channel. The Northern Channel flows by gravity at this termination point through a pipe to the terminus of Lockheed Channel. Water flows from the eastern terminus of the Lockheed Channel, where it is pumped through a lift station and into the Moffett Channel. Water in the Moffett Channel drains into Guadalupe Slough, which drains into San Francisco Bay (Tetra Tech EM Inc. 2003).

5.4 TOPOGRAPHIC FEATURES

The Northern Channel and related areas are located in the northeast area of the former NAS Moffett Field (see Figure 2). The Northern Channel is nearly 2 miles long and receives stormwater from the eastern portion of the former NAS Moffett Field. The channel contains mostly brackish water. The surface area of the channel is about 9 acres; its bottom substrate is sediment, and the banks are fill material from various sources. The width of the channel is 40 to 50 feet, but increases to 70 feet at the west end; the channel is about 10,000 feet long, and the bottom of the channel lies approximately 2.8 feet below mean sea level. The north levee is made of compacted hard clay and is from 2.5 to 5 feet high (above the water level in the channel), with flat surfaces and steep side slopes. Marriage Road Ditch is perpendicular to and south of the Northern Channel and extends about 2,300 feet. The bottom of the ditch is 5 to 6 feet below mean sea level. The North Patrol Road Ditch is parallel to and immediately south of the Northern Channel and runs 4,300 feet. A berm separates the Northern Channel and North Patrol Road Ditch. The bottom of the North Patrol Road Ditch is 5 to 6 feet below mean sea level.

5.5 ECOLOGY

The Northern Channel is a water habitat of moderate value to both aquatic and terrestrial species. However, physical, biological, and anthropogenic factors limit the use of this habitat. The small size and narrow width of the channel and the steepness of the side slopes limit the use of the area by terrestrial species, shorebirds, and wading birds. Maintenance mowing along the levee slopes prevents development of adequate cover that would benefit both terrestrial and aquatic species. The high levels of algal production in the channel are the result of fluctuating levels of dissolved oxygen that may have effects on development and stability of aquatic communities. Sediments are naturally anoxic below the shallow sediment-water boundary as a result of decomposition of relatively high levels of organic material. These conditions are found in many eutrophic, brackish slow-water systems and present challenges to the limnetic and benthic species that inhabit or attempt to inhabit the area.

Ecological surveys were conducted for plants, benthic invertebrates, fish, birds, and mammals (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a). Results of the surveys are discussed in the following paragraphs. Special-status species, including California species of special concern, are noted for each area when present. Species of special concern

status applies to animals not listed under the federal Endangered Species Act or the California Endangered Species Act, but which nonetheless (1) are declining at a rate that could result in listing or (2) historically occurred in low numbers and known threats to their persistence currently exist (California Department of Fish and Game 2005).

Results of ecological surveys indicated that the Northern Channel supports several fish and epibenthic invertebrate species, including mosquitofish (*Gambusia affinis*), longjaw mudsuckers (*Gillichthys mirbilis*), bay shrimp, crabs, and snails (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a). The physical characterization investigation of the Northern Channel found numerous small conical snails identified as *Assiminea californica*, which are common in pickleweed (*Salicornia virginica*) marshes and can survive wide fluctuations in salinity (Montgomery Watson, Inc. 2000). The most prevalent aquatic invertebrate observed in the habitat and receptor survey (Western Ecological Services Company 1993) was the water boatman (*Trichocorixa* spp.), which was found throughout the Northern Channel.

The vegetative community along the slopes of the berms on either side of the Northern Channel consists predominantly of the following: mustard (*Brassica nigra*), salt brush (*Atriplex patula*), rip-gut brome (*Bromus diandrus*), rabbit's foot grass (*Polypogon monspeliensis*), coyote brush (*Baccharis douglasii*), and alkali heath (*Frankenia salina*). Emergent hydrophytic vegetation, including alkali bulrush (*Scirpus maritimus*), brass buttons (*Cotula cornopifolia*), pickleweed, rabbit's foot grass, salt brush, and salt grass (*Distichlis spicata*), grows along the lower edges of the channel and ranges from 2 inches to 2 feet tall (Tetra Tech EM Inc. 2003). The presence of alkali bulrush and brass buttons as dominant plant species is significant because they are excellent sources of food for waterfowl. However, the relatively small and narrow size of this habitat and the occasional maintenance mowing along the channel banks diminish its overall value.

The Northern Channel provides habitat for a diverse array of water birds, particularly at the west end, where the channel widens and a breached dike forms islands. Prevalent species identified during the Phase I site-wide ecological assessment (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a) include pied-billed grebe (*Podilymbus podiceps*), common moorhen (*Gallinula chloropus*), mallard duck (*Anas platyrhynchos*), ruddy duck (*Oxyura jamaicensis*), black-necked stilt (*Himantopus mexicanus*), and Forster's tern (*Sterna forsteri*). The great blue heron (*Ardea herodias*) was also identified in the Northern Channel area (Montgomery Watson, Inc. 2000).

More recently, National Aeronautics and Space Administration identified the western pond turtle (*Clemmys marmorata*), a California species of special concern, in the Northern Channel (National Aeronautics and Space Administration 2002).

Marriage Road Ditch is a defined channel with steep fill banks. Hydrophytic vegetation that grows in and along the sides of the ditch includes narrow-leaved cattail (*Typha latifolia*), alkali bulrush, rabbit's foot grass, and curly dock (*Rumex crispus*). Invertebrates identified in the ditch include water boatmen, chironomids, and oligochaetes. Empty gastropod shells were found in Marriage Road Ditch, indicating that gastropods were previously present. The western pond

turtle has also been identified in Marriage Road Ditch (National Aeronautics and Space Administration 2002).

Patrol Road Ditch is intermittently flooded by irrigation runoff from the golf course, surface runoff, and seasonal precipitation. Patrol Road Ditch is swale-like and covers 1 acre. Vegetation ranges from low-stature hydrophytes such as pickleweed, salt brush, salt grass, brass buttons, and rabbit's foot grass, to alkali bulrush and narrow-leaved cattails. Patrol Road Ditch provides both open water and ruderal upland habitats (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). Birds identified in Patrol Road Ditch include the common moorhen, American coot (*Fulica americana*), black-necked stilt, and American avocet (*Recurvirostra americana*).

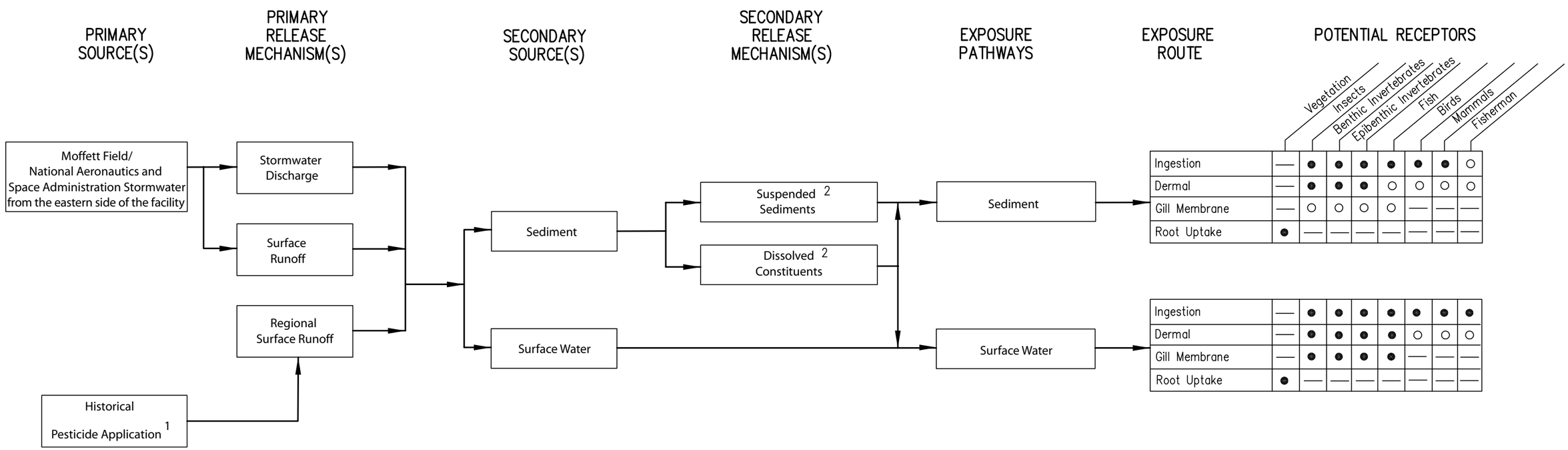
The North Patrol Road Ditch is 2 feet wide with defined banks made of fill material and emergent hydrophytic vegetation, including mustard, salt brush, rip-gut brome, rabbit's foot grass, pickleweed, and alkali heath. Few plant species were observed because of the poor-quality habitat. Birds and mammals observed using the ditch include the mallard duck, common moorhen, killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), and California ground squirrel. Burrowing owls (*Speotyto cunicularia*), a California species of special concern, use the ruderal habitat provided by the levee that separates the ditch from the Northern Channel. The western pond turtle has also been identified in the North Patrol Road Ditch (National Aeronautics and Space Administration 2002).

5.6 ARCHAEOLOGICAL OR HISTORICALLY IMPORTANT SITES

No archaeological or historically important sites have been identified in the Northern Channel area (National Aeronautics and Space Administration 2002).

5.7 NATURE AND EXTENT OF CONTAMINATION

The Northern Channel and related ditches receive stormwater runoff from the eastern portion of the former NAS Moffett Field. The sources of contamination and the potential exposure pathways are presented in the conceptual site model for the Northern Channel and related areas. Figure 3 shows the conceptual site model for Site 27. Concentrations of metals in sediment in the Northern Channel and related ditches are found to be similar to concentrations in other sediments that receive urban runoff. Stormwater from areas within the former NAS Moffett Field is a source of contamination. This contamination is likely from nonpoint sources because the Northern Channel has historically been flooded by bay water from the Moffett Channel and the former Cargill Salt evaporation ponds when heavy rainfall coincides with high tidal events (spring tides) (Tetra Tech EM Inc. 2003). The concentrations of total polychlorinated biphenyls (PCB) are believed to be from urban runoff and transformers, and the concentrations of total dichlorodiphenyltrichloroethane (DDT) are from application of pesticides at the former NAS Moffett Field for vector control and agriculture.



ROUTE POTENTIALLY COMPLETED

○ POTENTIALLY COMPLETE PATHWAY

● COMPLETE PATHWAY

— NO COMPLETE PATHWAY

Notes:
1. Regional nonpoint sources to the estuary unrelated to Navy activites.
2. Changes in salinity, concentration of dissolved or suspended solids, biological cycles, pH, and redox conditions may also alter the form of the chemicals present in the study area.

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FIGURE 3
CONCEPTUAL SITE MODEL

Record of Decision
Site 27 - Northern Channel

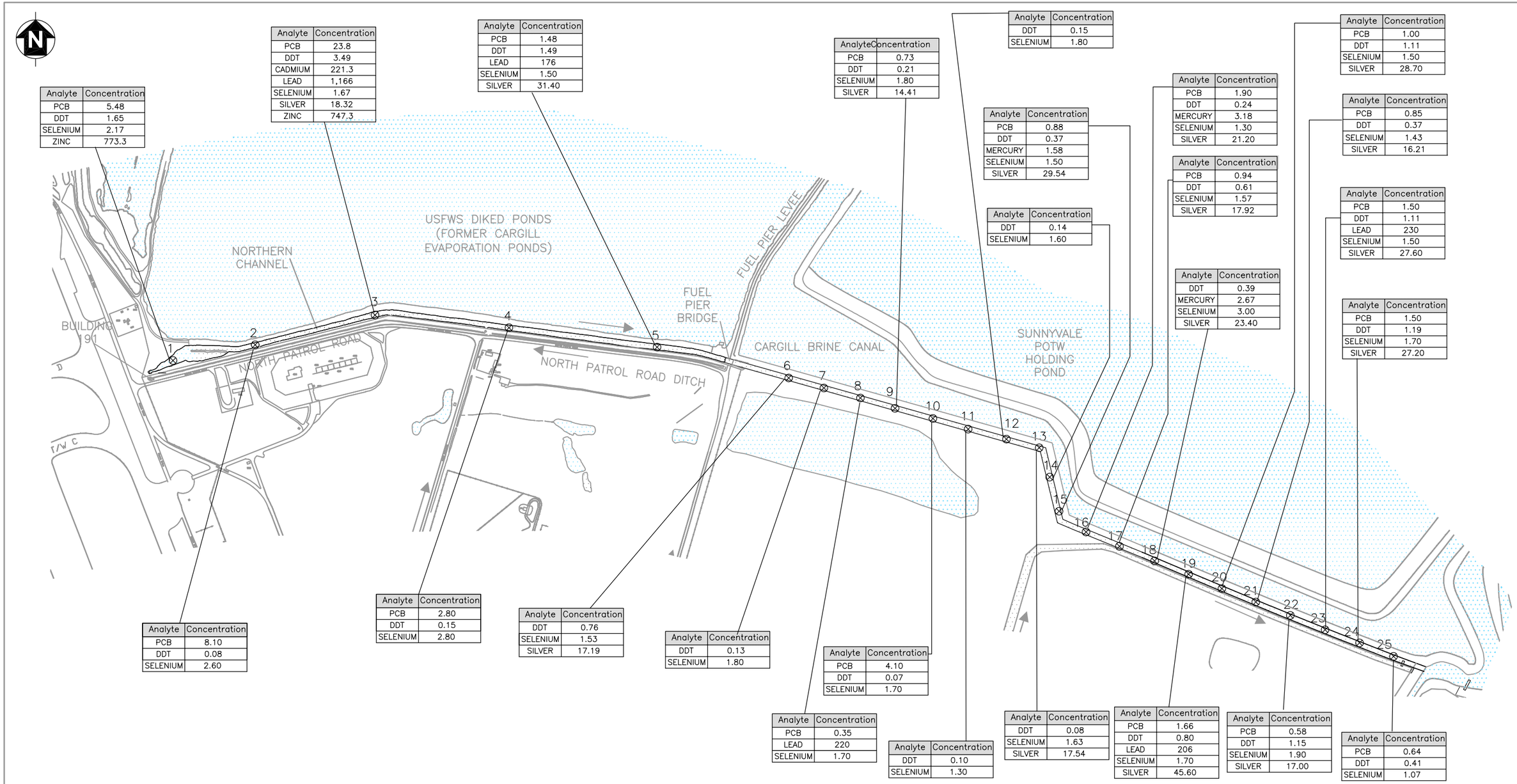
From 1992 to 2002, the Navy conducted a series of environmental studies to assess the ecology and the nature and extent of contamination at Site 27, and specifically the Northern Channel. Initial studies of the Northern Channel and related areas, such as the Phase I and Phase II site-wide ecological assessments (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995b, 1997), identified PCBs, pesticides, and metals as chemicals of ecological concern (COEC) in sediments in the Northern Channel. However, the limited data collected were not adequate to characterize the lateral and vertical extent of these chemicals in the Northern Channel, particularly in its eastern end. Sample points from the physical characterization study for the Northern Channel extended farther east but characterized only the lateral and vertical extent of PCBs in sediment (Montgomery Watson, Inc. 2000). Therefore, additional data were collected during the data gaps investigation in May 2002 to more fully characterize the lateral and vertical extent of contaminants in the channel (Tetra Tech EM Inc. 2003). Figure 4 shows the Northern Channel transect locations and the locations where PCBs, DDT, and metals were detected in sediment at concentrations exceeding cleanup goals.

During September 2004, soil samples were collected from the Lockheed berm located south of the Northern Channel because this berm was not sampled during the data gaps investigation (Tetra Tech FW, Inc. 2005). The Lockheed berm sampling locations are shown on Figure 5.

The following sections describe the sampling strategy, the types of samples collected, and the concentrations of chemicals identified in sediment and soil samples collected from the Northern Channel and related areas, the berms, and the debris pile during the data gaps investigation. The feasibility study was based on data collected during the data gaps investigation (Tetra Tech EM Inc. 2003). The following sections also present the results of soil samples collected collected along the Lockheed berm after the feasibility study was completed. Groundwater was not investigated at Site 27 because (1) groundwater in the area is not considered of beneficial use due to its high concentrations of total dissolved solids and (2) COECs such as PCBs and DDT detected in the sediments are generally hydrophobic and immobile and, therefore, are not expected to migrate via groundwater.

5.7.1 Sampling Strategy

In May 2002, samples of sediment (at several depth intervals) and the clay layer were collected from the Northern Channel at 25 regularly spaced transects to further investigate the nature and extent of contamination during the data gaps investigation (Tetra Tech EM Inc. 2003). The 25 transects included 5 between Building 191 and the Fuel Pier Bridge and 20 between the Fuel Pier Bridge and the eastern terminus of the Northern Channel. Figure 4 shows the Northern Channel transect locations and the locations where PCBs, DDT, and metals were detected in sediment at concentrations exceeding cleanup goals. Surface water, plant, benthic invertebrate, and fish tissue samples were also collected at most of the sediment sampling locations. More details on the sampling strategy are provided in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003).



Analyte	Concentration
PCB	5.48
DDT	1.65
SELENIUM	2.17
ZINC	773.3

Analyte	Concentration
PCB	23.8
DDT	3.49
CADMIUM	221.3
LEAD	1,166
SELENIUM	1.67
SILVER	18.32
ZINC	747.3

Analyte	Concentration
PCB	1.48
DDT	1.49
LEAD	176
SELENIUM	1.50
SILVER	31.40

Analyte	Concentration
PCB	0.73
DDT	0.21
SELENIUM	1.80
SILVER	14.41

Analyte	Concentration
DDT	0.15
SELENIUM	1.80

Analyte	Concentration
PCB	0.88
DDT	0.37
MERCURY	1.58
SELENIUM	1.50
SILVER	29.54

Analyte	Concentration
DDT	0.14
SELENIUM	1.60

Analyte	Concentration
PCB	1.90
DDT	0.24
MERCURY	3.18
SELENIUM	1.30
SILVER	21.20

Analyte	Concentration
PCB	0.94
DDT	0.61
SELENIUM	1.57
SILVER	17.92

Analyte	Concentration
DDT	0.39
MERCURY	2.67
SELENIUM	3.00
SILVER	23.40

Analyte	Concentration
PCB	1.00
DDT	1.11
SELENIUM	1.50
SILVER	28.70

Analyte	Concentration
PCB	0.85
DDT	0.37
SELENIUM	1.43
SILVER	16.21

Analyte	Concentration
PCB	1.50
DDT	1.11
LEAD	230
SELENIUM	1.50
SILVER	27.60

Analyte	Concentration
PCB	1.50
DDT	1.19
SELENIUM	1.70
SILVER	27.20

Analyte	Concentration
PCB	8.10
DDT	0.08
SELENIUM	2.60

Analyte	Concentration
PCB	2.80
DDT	0.15
SELENIUM	2.80

Analyte	Concentration
DDT	0.76
SELENIUM	1.53
SILVER	17.19

Analyte	Concentration
DDT	0.13
SELENIUM	1.80

Analyte	Concentration
PCB	4.10
DDT	0.07
SELENIUM	1.70

Analyte	Concentration
PCB	0.35
LEAD	220
SELENIUM	1.70

Analyte	Concentration
DDT	0.10
SELENIUM	1.30

Analyte	Concentration
DDT	0.08
SELENIUM	1.63
SILVER	17.54

Analyte	Concentration
PCB	1.66
DDT	0.80
LEAD	206
SELENIUM	1.70
SILVER	45.60

Analyte	Concentration
PCB	0.58
DDT	1.15
SELENIUM	1.90
SILVER	17.00

Analyte	Concentration
PCB	0.64
DDT	0.41
SELENIUM	1.07

⊗ TRANSECT SEDIMENT SAMPLING LOCATION

DIRECTION OF FLOW

SURFACE WATER

CLEANUP GOALS

TOTAL PCBs = 0.350 mg/kg
TOTAL DDT = 0.0648 mg/kg
CADMIUM = 184 mg/kg
LEAD = 173 mg/kg
MERCURY = 1.52 mg/kg
SELENIUM = 0.926 mg/kg
SILVER = 13.7 mg/kg
ZINC = 720 mg/kg)

Notes:
Only concentrations that exceed cleanup goals are shown (in mg/kg).
Concentrations along transects 1, 3, 5, 6, 13, 15, 17, 21, and 25 are the average of three borings collected at the same sample depth interval.

COEC	Chemical of ecological concern
DDT	Dichlorodiphenyltrichloroethane
mg/kg	Milligrams per kilogram
PCB	Polychlorinated biphenyl
POTW	Publicly owned treatment works
USFWS	U.S. Fish and Wildlife Service

350 0 350 700
Scale: 1” = 700’

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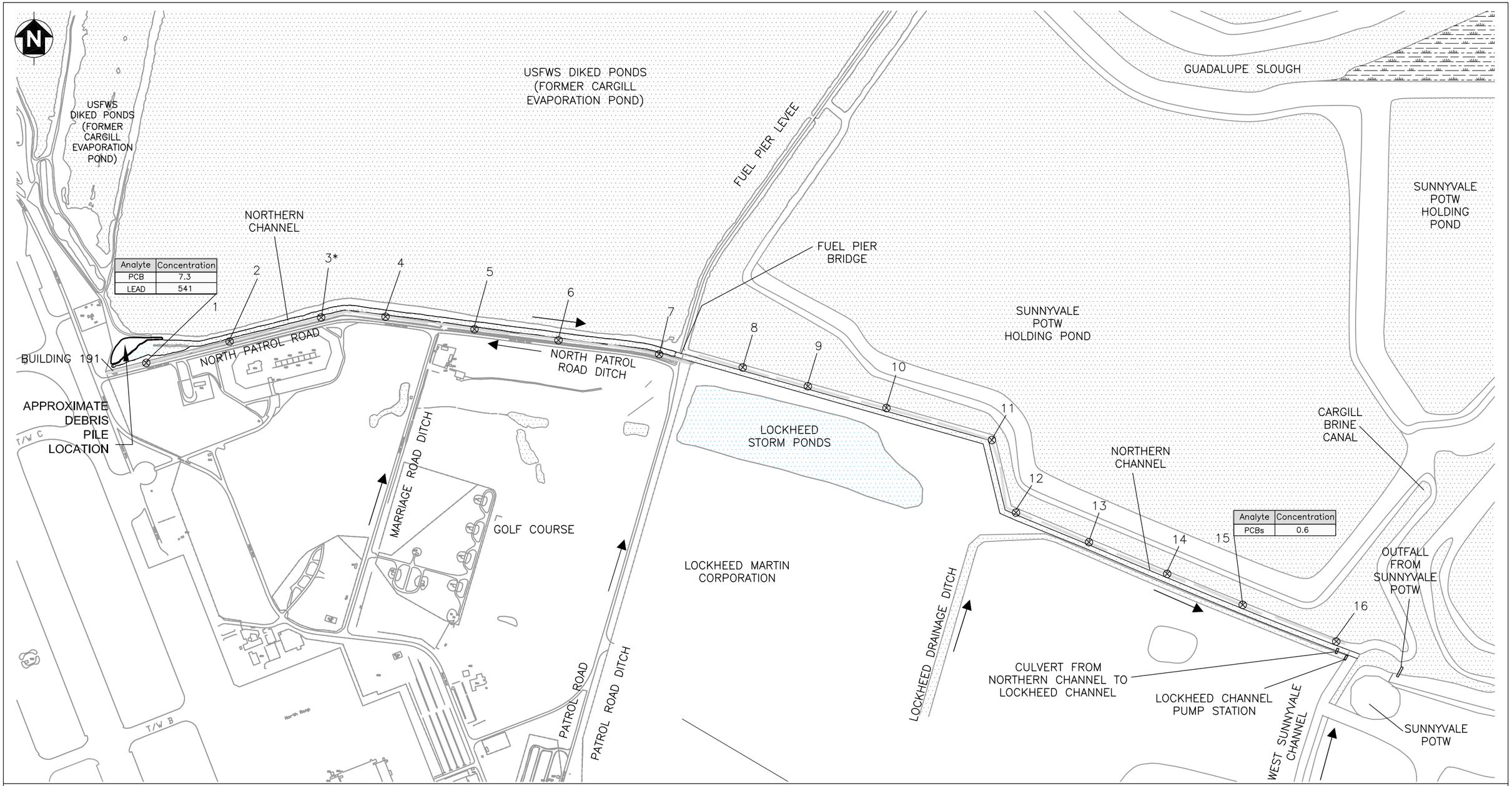
FIGURE 4
NORTHERN CHANNEL TRANSECT LOCATIONS AND ASSOCIATED SEDIMENT CONCENTRATIONS OF COECs THAT EXCEED CLEANUP GOALS
Record of Decision
Site 27 - Northern Channel



⊗ TRANSECT BERM SAMPLING LOCATION

BERM TRANSECT LOCATION

DIRECTION OF FLOW

SURFACE WATER

MARSH LAND

RESIDENTIAL PRGs

TOTAL PCBs	= 0.220 mg/kg
DDD	= 2.40 mg/kg
DDE	= 1.70 mg/kg
DDT	= 1.70 mg/kg
LEAD	= 150 mg/kg
MERCURY	= 23 mg/kg
SELENIUM	= 390 mg/kg
SILVER	= 390 mg/kg
ZINC	= 23,000 mg/kg

Notes: Only the highest concentrations at each sample location that exceed cleanup goal are shown (in mg/kg)

* A composite sample in transect 3 exceeded the PRG for PCBs, however, no discrete samples in transect 3 exceed the PRG.

COEC	Chemical of ecological concern
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
mg/kg	Milligrams per kilogram
PCB	Polychlorinated biphenyl
POTW	Publicly owned treatment works
USFWS	U.S. Fish and Wildlife Service

350 0 350 700

Scale: 1" = 700'

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FIGURE 5

BERM TRANSECT LOCATIONS WITH SOIL CONCENTRATIONS THAT EXCEED RESIDENTIAL PRELIMINARY REMEDIATION GOALS

Record of Decision

Site 27 - Northern Channel

Soil samples were also collected along the entire length of the northern berm of the Northern Channel (Cargill berm) and along the southern berm from the Building 191 lift station to the Fuel Pier Bridge (National Aeronautics and Space Administration berm) (Tetra Tech EM Inc. 2003). More recently, additional soil samples were collected on the southern berm from the Fuel Pier Bridge east to the end of the Northern Channel. The Cargill berm was divided into 16 sections, and the National Aeronautics and Space Administration berm was divided into 6 sections. Each section of the berm was 630 feet long, and two samples were collected from every 210-foot subsection. Figure 5 showed the berm transect locations and the locations where PCBs, DDT, and metals were detected in soil at concentrations exceeding residential preliminary remediation goals. Ten additional soil samples were collected from the 0- to 1-foot interval in the same manner at the debris pile, which is located on the Cargill berm north of the Building 191 lift station. Figure 6 shows the sampling locations at the debris pile and the locations where PCBs, DDT, and metals were detected at concentrations exceeding sediment cleanup goals.

Sediment samples were also collected from the Marriage Road Ditch, Patrol Road Ditch, and North Patrol Road Ditch. Sediment samples were collected from 10 locations (evenly spaced) in each ditch to characterize the concentrations of chemicals in sediments (Tetra Tech EM Inc. 2003). Sediment samples were analyzed for PCBs, pesticides, metals, and total organic carbon. Figure 7 shows the ditch transect locations and the locations where PCBs, DDT, and metals were detected in sediment at concentrations exceeding cleanup goals.

All sediment, soil, surface water, plant, benthic invertebrate, and fish tissue samples were analyzed for various chemicals, including PCBs, organochlorine pesticides, metals, volatile organic compounds, semivolatile organic compounds, and total petroleum hydrocarbons. Sediment and soil samples were analyzed for PCB congeners as well as for Aroclors to better characterize the nature and extent of PCB contamination in the Northern Channel and related areas (ditches, berms, and debris pile).

During sampling along the Lockheed berm (Tetra Tech FW, Inc. 2005), 25 soil samples were collected from 13 locations along 9 transects (see Attachment 1). At each location, two samples were collected from different depths (0.0 to 0.5 and 0.5 to 1 feet below ground surface). An additional sample was collected from a soil debris pile located on the berm within Transect 7. The samples were analyzed for PCBs, pesticides, metals, and total organic carbon.

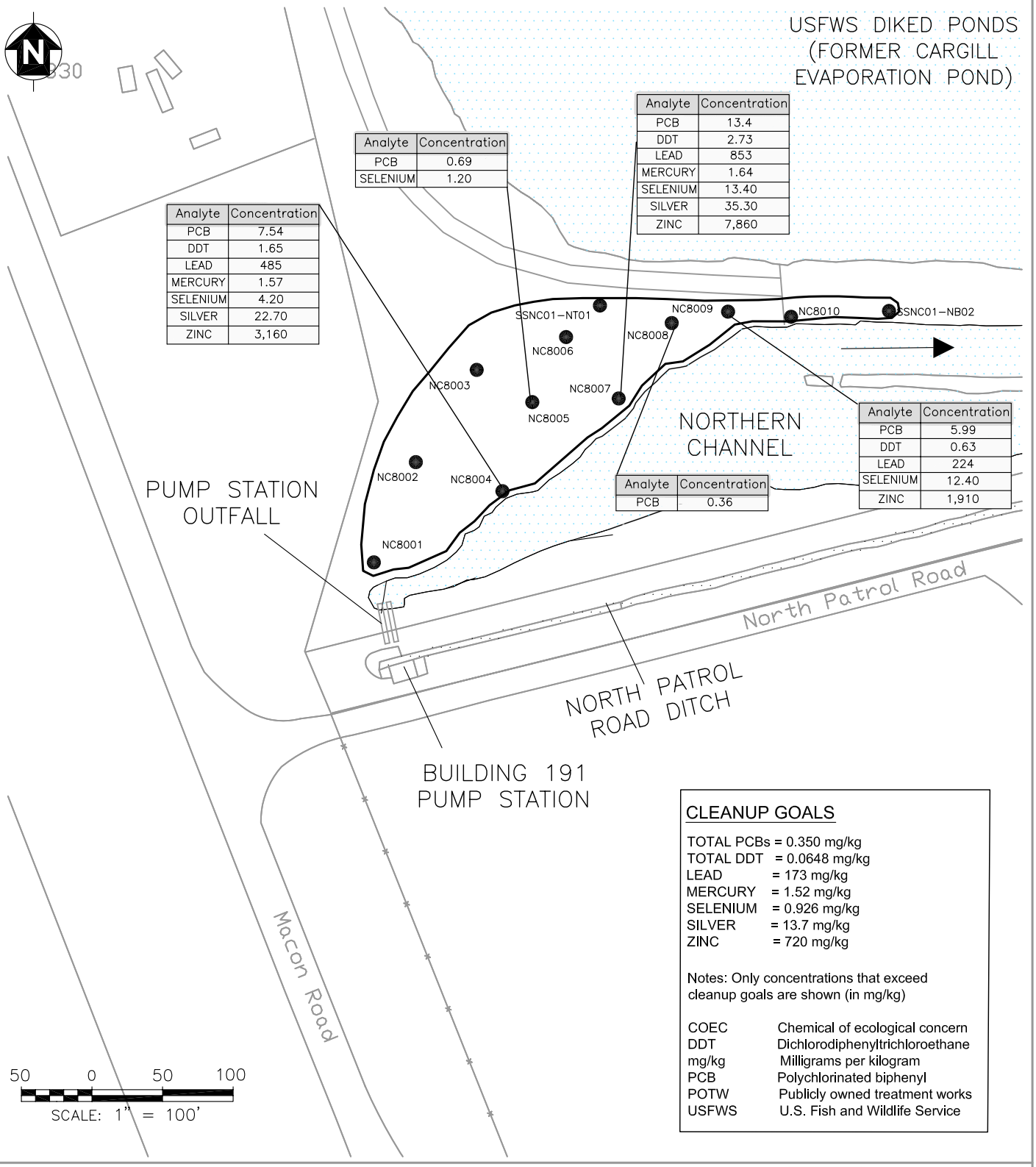

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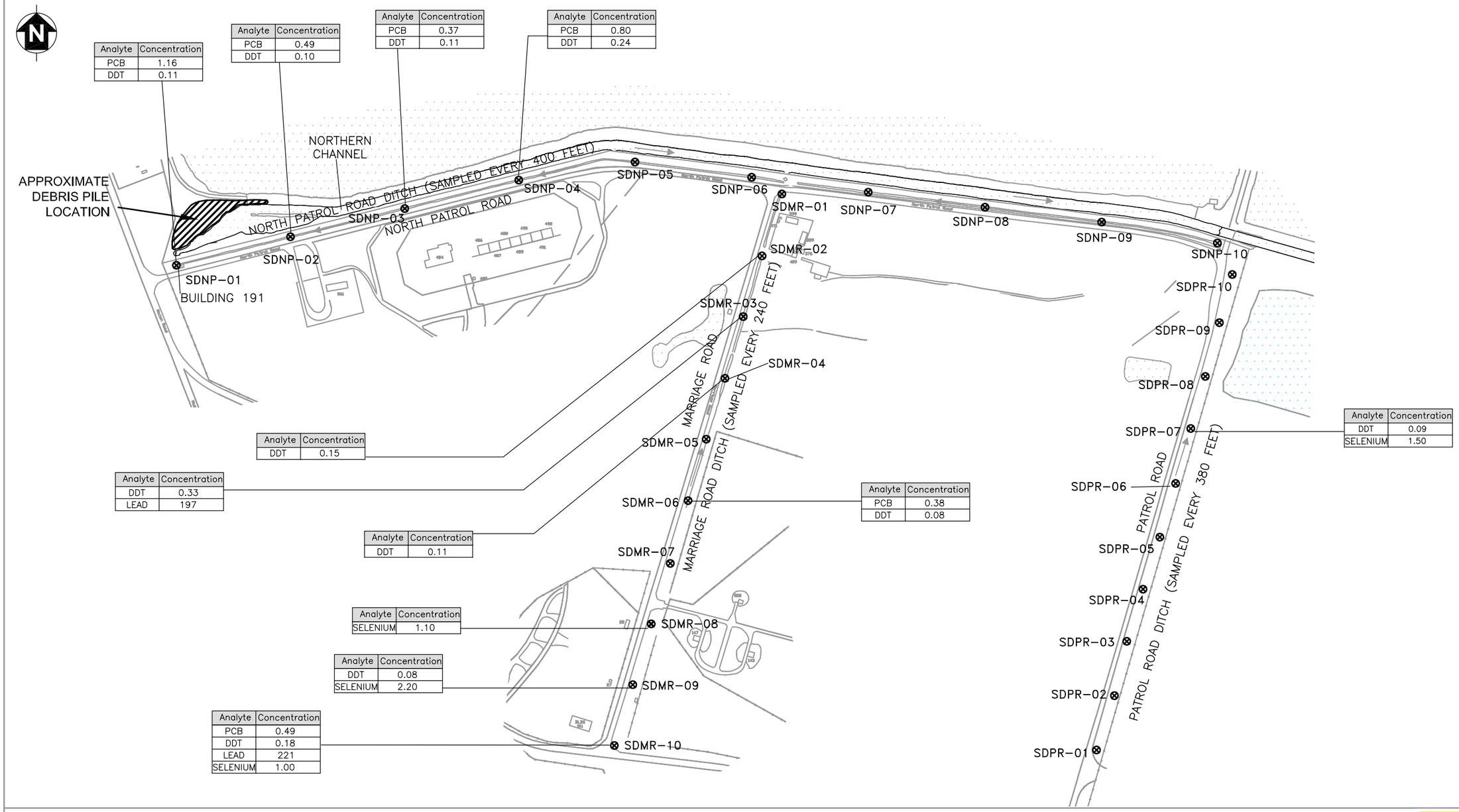
FIGURE 6
DEBRIS PILE SAMPLING LOCATIONS AND ASSOCIATED SOIL CONCENTRATIONS OF COECs THAT EXCEED CLEANUP GOALS

Record of Decision
Site 27 - Northern Channel



⊗ TRANSECT SEDIMENT SAMPLING LOCATION

→ DIRECTION OF FLOW

SURFACE WATER

CLEANUP GOALS

TOTAL PCBs = 0.350 mg/kg
TOTAL DDT = 0.0648 mg/kg
LEAD = 173 mg/kg
SELENIUM = 0.926 mg/kg

Notes: Only the highest concentrations at each sample location that exceed cleanup goal are shown (in mg/kg)

COEC Chemical of ecological concern
DDT Dichlorodiphenyltrichloroethane
mg/kg Milligrams per kilogram
PCB Polychlorinated biphenyl

200 0 200 400
Scale: 1" = 400'

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FIGURE 7
DITCH SAMPLE TRANSECT LOCATIONS AND ASSOCIATED SEDIMENT CONCENTRATIONS OF COECs THAT EXCEED CLEANUP GOALS
Record of Decision
Site 27 - Northern Channel

5.7.2 Summary of Chemical Concentrations

This section presents the chemical concentrations found in sediment, soil, and surface water and biota, as well as conclusions based on these concentrations.

Sediment

The data gaps investigation specifically focused on further characterization of the nine COECs (total PCBs, total DDT, total chlordane, cadmium, lead, mercury, selenium, silver, and zinc) at Site 27 in sediment from the Northern Channel, related ditches, and the debris pile near the Building 191 lift station. Sediment concentrations of the nine COECs were compared to cleanup goals established for Site 27. The cleanup goals were used to define areas needing remedial action. The Navy included total dichlorodiphenyltrichloroethane and total chlordane as part of the investigation at Site 27 because these chemicals are the result of runoff from other areas. Section 7.0 provides more details on the identification of COECs and cleanup goals for Site 27.

In the Northern Channel, total PCBs were detected in most sediment sampling locations at concentrations above the cleanup goal (0.35 milligrams per kilogram [mg/kg]), with a maximum concentration of 23.8 mg/kg (see Figure 4) (Tetra Tech EM Inc. 2003). DDT was detected in all sediment sampling locations, except for Transect 8, at concentrations above the cleanup goal (0.0648 mg/kg), with a maximum concentration of 3.49 mg/kg (see Figure 4). DDT was not detected at a concentration above the cleanup goal in the sample collected from Transect 8. Total chlordane was not detected above the cleanup goal at any locations; however, a sample from one location (SDNC03-6) had a chlordane concentration just below the cleanup goal (0.931 mg/kg). All six metals identified as COECs had concentrations above their respective cleanup goals in samples from at least one location, with silver and selenium being detected the most at concentrations above their cleanup goals (see Figure 4). The highest concentrations of all COECs are present near the top of the sediment surface. Concentrations of COECs in the deeper clay channel bottom were much lower and did not exceed cleanup goals.

In the three ditches, PCBs and DDT were detected at concentrations in sediments above cleanup goals in some sampling locations, particularly in the upper sediment layers of Marriage Road Ditch and the western end of North Patrol Road Ditch (see Figure 7) (Tetra Tech EM Inc. 2003). Metals (specifically lead and selenium) were sporadically detected at concentrations above cleanup goals in samples from Marriage Road Ditch, but generally at concentrations less than cleanup goals in samples from the other two ditches. Concentrations of PCBs, DDT, and metals in deeper clay samples from the channel bottom from these areas were less than cleanup goals.

Additionally, some samples in transect 1 adjacent to Building 191 and partially within the debris pile area contained concentrations of PCBs, DDT, lead, selenium, silver, and zinc that exceeded sediment cleanup goals. Samples from the debris pile contained PCBs, DDT, lead, mercury, selenium, silver, and zinc at concentrations that exceeded cleanup goals (see Figure 6).

Soil

Soil samples from berms along the Northern Channel were also analyzed (Tetra Tech EM Inc. 2003). Soil concentrations from berms were compared to residential preliminary remediation goals (PRG) (U.S. Environmental Protection Agency 2004). Concentrations of chemicals in soil exceeded the residential PRGs along the Northern Channel berms at Transects 1 and 15 (see Figure 5). PCBs were detected in soil at concentrations greater than the residential PRG from one composite sample collected along Transect 3; however, discrete samples comprising the composite sample were also analyzed and found to have PCB concentrations less than the PRG.

Surface Water and Biota

PCBs and pesticides were not detected in any surface water samples from the Marriage Road Ditch, Patrol Road Ditch, or the North Patrol Road Ditch during the data gaps investigation (Tetra Tech EM Inc. 2003). A few metals were detected in surface water samples from the two ditches at concentrations slightly above ambient water quality criteria for fresh water from U.S. Environmental Protection Agency (Buchman 1999).

In the Northern Channel, PCBs and pesticides were detected at low concentrations and frequency in all surface water and biota samples (Tetra Tech EM Inc. 2003). Alpha-chlordane was detected in 14.3 percent of the samples, ranging in concentrations from 0.002 to 0.004 micrograms per kilograms. All six metals (as both dissolved and total) were detected in surface water samples from the Northern Channel. PCBs were detected in benthic invertebrate samples collected from within sediments, and PCBs, pesticides, and metals were detected at low levels in most fish tissue samples and in some plant tissue samples collected throughout the Northern Channel.

Conclusions

Based on the results of the data gaps investigation and the comparison of sediment concentrations to cleanup goals for Site 27, contaminated sediment associated with the nine COECs from following areas will be addressed during remediation activities:

- Sediment throughout the length of the Northern Channel
- Sediment from the entire length of the North Patrol Road Ditch
- Sediment in most of the Marriage Road Ditch

In addition, based on the results of the data gaps investigation and sampling along the Lockheed berm, soils from the following areas will be addressed during the remediation activities:

- The debris pile on the Cargill berm near Building 191
- The western end of the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191 (Transect 1)
- The Lockheed berm near the eastern end of the Northern Channel (Transect 15)

Based on results of the data gaps investigation and comparison of sediment concentrations to cleanup goals for Site 27, sediment along the entire length of the Patrol Road Ditch does not need to be addressed during remediation activities.

6.0 CURRENT AND FUTURE LAND AND RESOURCE USE

In April 1991, the Base Realignment and Closure Commission voted to (1) decommission the former Naval Air Station (NAS) Moffett Field, (2) transfer naval operations from the former NAS Moffett Field to other naval facilities, and (3) transfer most of the former NAS Moffett Field property to the National Aeronautics and Space Administration Ames Research Center.

The areas south and west of Site 27 are part of the former NAS Moffett Field. Current tenants include the U.S. Army, the U.S. Air Force, and the California Air National Guard. Current uses include airfield operations, military facilities, and National Aeronautics and Space Administration research facilities. The former NAS Moffett Field has a fully functional federal airport and maintains facilities for military personnel and their families, including housing, commissary, clinic, service station, tennis courts, and a golf course. The tidal salt marsh and mud flats north and northeast of the former NAS Moffett Field were diked more than 50 years ago and were formerly used as commercial saltwater evaporation ponds. Cargill Salt, the former owner, sold the ponds to the U.S. Fish and Wildlife Service in 2003.

Stormwater drainage is expected to be the future use of the Northern Channel and associated ditches, as it has been for the last 50 years. Remedial alternatives were selected and screened based on the premise that continued use for stormwater drainage is the most likely future land-use scenario. Existing beneficial uses of groundwater, including municipal and domestic, industrial process, and industrial and agricultural water supply, are listed in the Basin Plan (San Francisco Bay Regional Water Quality Control Board 1995). Concentrations of total dissolved solids in groundwater in the area of Site 27 do not meet criteria in U.S. Environmental Protection Agency classification guidelines for a potential source of drinking water. According to the Basin Plan, the beneficial uses for surface water near the site are freshwater/estuarine habitat and wildlife habitat (San Francisco Bay Regional Water Quality Control Board 1995).

7.0 SUMMARY OF SITE RISKS AND ESTABLISHMENT OF CLEANUP GOALS

This section summarizes the human health and ecological risk assessments conducted at Site 27 using chemical data from the site to assess potential risks to both humans and ecological receptors. Risk assessments were presented in the station-wide remedial investigation (PRC Environmental Management, Inc. 1996), the Phase I and II site-wide ecological assessments (SWEA) (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a, 1995b, 1997), and more recently in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003). Risk assessments are generally conducted to address the following:

- Potential chemicals of concern (chemicals that may contribute to the majority of risk)
- Potential human and ecological receptors (who or what might be at risk)
- Exposure pathways (how the chemicals may reach human or ecological receptors)
- Potential health impacts (how the receptors might be affected by exposure to the chemical)

The risk assessments concluded that areas within Site 27 might pose a risk to human health and to ecological receptors. The potential risk to ecological receptors (specifically birds) was found to be the primary concern and, therefore, the basis for the sediment cleanup goals and the focus of the cleanup action. The sediment cleanup goals are also protective of human health.

Based on information presented in the station-wide remedial investigation (PRC Environmental Management, Inc. 1996) and the SWEAs (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a, 1995b, 1997), the following chemicals were identified as chemicals of ecological concern (COEC) for the Northern Channel and related areas:

- Total polychlorinated biphenyls (PCB) (the sum of Aroclor-1254 and Aroclor-1260). PCBs consisted of Aroclor-1254 and Aroclor-1260 because no other Aroclors were detected and the congener-specific data did not support the presence of other Aroclors in the Northern Channel or related areas.
- Total dichlorodiphenyltrichloroethane (DDT) (the sum of dichlorodiphenyl-dichloroethane, dichlorodiphenyldichloroethene, and DDT)
- Total chlordane (the sum of alpha- and gamma-chlordane)
- Cadmium
- Lead
- Mercury
- Selenium
- Silver
- Zinc

7.1 HUMAN HEALTH RISK ASSESSMENT

The potential human health risks associated with sediments in the Northern Channel were assessed by two different methods: (1) risks to potential residential, occupational, and recreational receptors using an exposure area approach, and (2) risks to potential occupational and residential receptors using a point-risk approach (PRC Environmental Management, Inc. 1996). The exposure area approach identified potential receptors in a predetermined area over which exposure occurs (0.5-acre parcels for residential, occupational, and recreational exposure scenarios). Risk estimates were calculated from average concentrations of chemicals of potential concern within the selected area. In contrast, risk estimates were calculated for each data point in the point-risk approach. Both approaches were used in the human health risk assessment presented in the final station-wide remedial investigation report to characterize potential risks to human health from exposure pathways associated with chemicals of potential concern in surface and subsurface soils (PRC Environmental Management, Inc. 1996).

Although residential, occupational, and recreational risk scenarios were evaluated, it was concluded that Site 27 is not likely to be available for occupational or residential use and, therefore, that the potential risks associated with these two scenarios likely do not exist because the exposure pathways would be incomplete (PRC Environmental Management, Inc. 1996). The recreational risk scenario (for example, hiking, canoeing, and bird watching) was evaluated as a more realistic potential future pathway. The current and planned future use of the site is for stormwater drainage; therefore, recreational use of the Northern Channel is expected to remain unchanged in the future. In accordance with U.S. Environmental Protection Agency (EPA) protocols, the human health risk assessment for recreational receptors evaluated both cancer and noncancer risks for the following areas:

- Northern Channel: the estimated cancer risk is 2.1E-05 and the estimated noncancer hazard index is 0.39 for a recreational user.

- Marriage Road Ditch: the estimated cancer risk is less than 1.01E-06 and the estimated noncancer hazard index is less than 1.0, as presented in the remedial investigation for Operable Unit 2 (International Technology Corporation 1992). Based on these results, a no-action record of decision was signed in October 1994 (Navy and EPA 1994). The no-action record of decision addressed only effects to human health.

- North Patrol Road Ditch: the estimated cancer risk is 2.1E-05 and the estimated noncancer hazard index is 0.39 for a recreational user.

These risks are within or less than the cancer risk management range of 10^{-6} to 10^{-4} and less than an hazard index of 1.0 for noncancer risks that EPA generally considers acceptable. In addition, human health risks were found to be minimal when compared with the potential risks to ecological receptors; therefore, cleanup goals established to protect ecological receptors are expected to further reduce risks to recreational users.

7.2 ECOLOGICAL RISK ASSESSMENT

A SWEA was conducted in two phases to assess potential risks to flora and fauna associated with exposure to chemicals of potential ecological concern in sediment at former Naval Air Station Moffett Field. The media addressed in the SWEA included surface water, pore water, wetland sediments, and upland soils. The Phase I SWEA provided conceptual site models, including a description of habitats, a qualitative evaluation of chemical sources, exposure pathways, and plants and animals (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a). A follow-up component to the Phase I SWEA, known as the "SWEA data gaps investigation," was conducted to address chemical and spatial data gaps in the information presented in the final Phase I SWEA (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995a). Information collected during the SWEA data gaps investigation is presented in the final Phase II SWEA work plan (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995b). The final Phase II SWEA report described the quantitative and qualitative ecological risk assessment and included data collected during both phases (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). The primary objective of the Phase II SWEA was to evaluate risk to ecological receptors from exposure to contaminants at former Naval Air Station Moffett Field. Nine COECs (total PCBs, total DDT, total chlordane, cadmium, lead, mercury, selenium, silver, and zinc) were identified during the SWEA process. In May 2002, an additional data gaps investigation was conducted specifically in the Northern Channel, related ditches, and adjacent berms. Results of this investigation were presented in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003).

7.2.1 Summary of Surface Water Evaluation

Risks were calculated for the surface and pore water evaluation using EPA methodology (EPA 1997) and results for laboratory tests (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). In the laboratory tests, laboratory organisms (algae, crustaceans, and fish) were exposed to surface water samples from the site and analyzed to identify any effects. Based on the results of surface water bioassays for the Phase II SWEA (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997), it was concluded adverse effects from exposure to surface water are unlikely. Data for surface water collected in the data gaps investigation in May 2002 also support the observation that concentrations of the nine COECs are low or not detected in surface water (Tetra Tech EM Inc. 2003).

7.2.2 Summary of Sediment Evaluation

Although the Phase II SWEA found a moderate to high likelihood of potential adverse effects on benthic invertebrate populations and birds, the U.S. Department of the Navy concluded that the primary focus should be on birds (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). This decision to focus on birds as representative receptors for the Northern Channel was supported by the agencies (EPA, San Francisco Bay Regional Water Quality Control Board, and U.S. Fish and Wildlife Service). As a result, the data gaps investigation in May 2002 focused on collecting additional data (fish, benthic invertebrates, plant tissue, along

with surface water and sediment) to support the risk evaluation of birds using the food-chain model and the development of site-specific allowable exposure levels (Tetra Tech EM Inc. 2003).

Assessment and measurement endpoints, and representative receptors, were initially identified in the final Phase II SWEA (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). Potential ecological risks from exposure to contaminated sediments were identified for birds based on exposure to the chemical concentrations at the site and the continued use of the site for stormwater drainage and management. The great blue heron, mallard duck, and the black-necked stilt were identified as the primary representative receptors based on initial risk calculations (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). More recently, the western pond turtle was added as a representative receptor because of its presence in the channel and its designation as a species of special concern in California. These four receptors were used in the risk assessment presented in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

Food-chain modeling is one method of integrating ecological information into the risk assessment process. Food-chain modeling includes factors such as life history and feeding behavior of receptors, spatial variations of chemicals in sediment, and spatial variation of chemicals in prey. These site-specific factors are especially relevant for chemicals that tend to bioconcentrate or bioaccumulate (Pascoe, Blanchet, and Linder 1996). Site-specific exposures for birds and mammals are generally based on daily dose estimates modeled from measurements of chemical concentrations in soil and food sources (Pascoe, Blanchet, and Linder 1996). Total exposure from ingestion for each receptor of concern is calculated as the sum of the estimates of the dietary and sediment or surface water exposure for each COEC. The resultant exposure dose is compared with toxicity reference values or toxicity literature values for reptiles only to assess whether there are risks to the receptor after exposure to a COEC.

Results of the exposure and effects assessments are used in the risk characterization phase to estimate risk to the ecological receptors represented by the assessment endpoints selected. Information obtained during the exposure and effects assessment is combined to evaluate the relationship between environmental concentrations of chemical stressors and observed adverse effects. Observed adverse effects (in the form of measurement endpoint results) are evaluated using environmentally relevant criteria to distinguish between results that indicate the potential for risk or that do not indicate risk. Risk calculations were prepared based on exposure assumptions for the individual receptor. Risk calculations consist of dividing the calculated dose by the toxicity reference values for each receptor and COEC. Consistent with EPA guidance (EPA 1992, 1997), calculated hazard quotients were compared with the threshold value of 1.0 to assess potential ecological risk to receptors at the site.

The ecological risk assessment indicated a potential for risks to ecological receptors (hazard quotients greater than 1.0), particularly the great blue heron and the black-necked stilt, from exposure to chemicals in sediments in the Northern Channel, related areas, and the debris pile and in soil in the berm area near Building 191 (see Table 1) (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995b). In particular, PCBs, DDT, and to a lesser extent, selenium, were found to have contributed to most of the risk.

TABLE 1: SUMMARY OF LOWER AND UPPER HAZARD QUOTIENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station, Moffett Field, California

Chemical of Ecological Concern	Great Blue Heron Total Dose[1]		Mallard Duck Total Dose[1]		Black-Necked Stilt Total Dose[1]		Western Pond Turtle Total Dose[1]	
	Lower HQ[2]	Upper HQ[2]	Lower HQ[2]	Upper HQ[2]	Lower HQ[2]	Upper HQ[2]	Dose[3] (mg/kg)	Criterion[3] (mg/kg)
Cadmium	0.01	**2.11**	0.0001	0.02	0.009	**1.89**	0.003	NA
Lead	0.09	**38.20**	0.002	0.96	0.16	**64.60**	0.02	NA
Mercury	0.02	0.09	0.002	0.01	0.15	0.71	0.0008	< 0.01 – 0.39
Selenium	**1.84**	**7.42**	0.22	0.88	0.86	**3.46**	0.06	NA
Silver	0.08	NA	0.004	NA	0.30	NA	0.01	NA
Zinc	0.17	**1.71**	0.002	0.02	0.18	**1.81**	0.81	NA
Total PCBs	**2.64**	**127.00**	0.18	**2.20**	**12.50**	**151.00**	0.11	NA
Total Chlordane	0.18	0.89	0.0004	0.002	0.06	0.29	0.02	NA
Total DDT	**3.10**	**665.00**	0.09	**4.89**	**8.52**	**458.00**	0.08	0.610

Notes: Bold values indicate an HQ greater than 1.0.

1 Total dose is based on site-specific sediment concentrations in the 0- to 1-foot layer.

2 Lower HQ = dose/high TRV, and Upper HQ = dose/low TRV.

3 There are no reptilian TRVs. Therefore, the calculated dose is compared qualitatively to criteria from the literature; see Table 2-11 in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

DDT Dichlorodiphenyltrichloroethane
HQ Hazard quotient
mg/kg Milligram per kilogram
NA Not available
PCB Polychlorinated biphenyl
TRV Toxicity reference value

Source:

Tetra Tech EM Inc. 2003. "Northern Channel Feasibility Study (Site 27), Former Naval Air Station, Moffett Field, Santa Clara County, California." November.

The western pond turtle could not be evaluated using the food-chain model to the same extent as the birds because limited laboratory and research data were available on the potential chemical effects associated with turtles and other reptiles (Tetra Tech EM Inc. 2003). However, a calculated dose was qualitatively compared with criteria on turtles from the literature. This comparison suggests that the turtle may be less sensitive to concentrations of the nine COECs at the site when compared with the other representative receptors. Details on the risk calculations are provided in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003).

The ecological risk assessment process involves a large number of uncertainties and extrapolations to evaluate potential risk to ecological receptors. Many of the assumptions in an ecological risk assessment are conservative (protective), resulting in an overestimate of site-specific risk parameters. Still, these assumptions are used to ensure that contaminants that may pose an ecological risk are not dismissed. Uncertainties associated with risk estimates are discussed in detail in the final Phase II SWEA report (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997) and the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

7.3 DEVELOPMENT OF CLEANUP GOALS FOR SEDIMENT

Cleanup goals for sediment were developed in accordance with EPA guidance (EPA 1988, 1994) to provide protection for the environment. In addition, applicable or relevant and appropriate requirements were considered in developing the final remedial action objectives and cleanup goals.

7.3.1 Media of Interest

Sediment was considered the potential medium of interest based on the potential risks to the environment identified in the final Phase II SWEA (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997) and the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003). Surface water was also considered as a potential medium of interest; therefore, surface water ingestion was included in the food-chain model for birds. However, results of the surface water bioassays indicated low to no likelihood of adverse effects caused by surface water (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). Therefore, surface water was not designated a medium of concern for the purposes of establishing cleanup goals.

7.3.2 Chemicals of Ecological Concern

COECs in sediment were identified based on information contained in the final Phase II SWEA report (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997) and related documents. COECs identified in the SWEA as potentially presenting risk included total PCBs, total DDT, total chlordane, cadmium, lead, mercury, selenium, silver, and zinc. These chemicals can be broadly grouped into total PCBs, pesticides, and metals.

The remedial action will focus on removal of contaminated sediment. Removing collocated metal, PCB, and total DDT contamination from sediment will also address risk from total chlordane, because the levels found in water originate from the underlying contaminated sediments.

7.3.3 Exposure Routes and Receptors

Results of the Phase II SWEA (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997) and the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003) indicated a complete exposure pathway exists for ecological receptors in direct contact with contaminated sediments. The primary exposure route is through ingestion of contaminated food items and incidental ingestion of sediments while feeding, grooming, or preening. The great blue heron, mallard duck, and black-necked stilt were identified as the primary representative receptors based on initial risk calculations (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). More recently, the western pond turtle was added as a representative receptor because of its presence in the channel and its designation as a species of special concern in California. These four receptors were used in the risk evaluation presented in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

7.3.4 Allowable Exposure Levels Based on Risk Assessment

Allowable exposure levels for sediment were derived after all risk calculations were completed by back-calculating a concentration in sediment, which resulted in hazard quotient of 1.0. The Navy concluded allowable exposure levels that are protective of the representative receptors would also be protective of other ecological receptors. Allowable exposure levels for each bird were developed for all nine COECs in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003). An allowable exposure level could not be calculated for the western pond turtle based on available information. Table 2 lists the cleanup goals for sediment based on the allowable exposure levels for the Northern Channel and related areas. The lowest allowable exposure levels for all COECs were calculated for either the black-necked stilt or the great blue heron.

TABLE 2: CLEANUP GOALS FOR SEDIMENT BASED ON ALLOWABLE EXPOSURE LEVELS IN THE NORTHERN CHANNEL AND RELATED AREAS

Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Chemical of Ecological Concern	Receptor	Cleanup Goal (mg/kg)	Benchmark	Approach for the Selection of Cleanup Goal
Organic Compounds				
Total PCBs	Birds	0.350	AEL	Based on risks to the black-necked stilt
Total Chlordane	Birds	0.931	AEL	Based on risks to the great blue heron
Total DDT	Birds	0.0648	AEL	Based on risks to the black-necked stilt
Metals				
Cadmium	Birds	184	AEL	Based on risks to the great blue heron
Lead	Birds	173	AEL	Based on risks to the black-necked stilt
Mercury	Birds	1.52	AEL	Based on risks to the black-necked stilt
Selenium	Birds	0.926	AEL	Based on risks to the great blue heron
Silver	Birds	13.7	AEL	Based on risks to the black-necked stilt
Zinc	Birds	720	AEL	Based on risks to the black-necked stilt

Notes:

AEL Allowable exposure level (based on risk results)
DDT Dichlorodiphenyltrichloroethane
mg/kg Milligram per kilogram
PCB Polychlorinated biphenyl

7.3.5 Comparison to Ambient Concentrations

Before final cleanup goals could be identified, calculated allowable exposure levels were compared with ambient concentrations in sediment. In this comparison, the Navy adopted cleanup goals that corresponded to the higher of either ambient or allowable exposure level concentrations. Allowable exposure levels were higher than ambient concentrations for the Northern Channel area for all nine COECs. More details on this comparison are provided in the final feasibility study report for the Northern Channel (Tetra Tech EM Inc. 2003).

7.3.6 Applicable or Relevant and Appropriate Requirements

Specific applicable or relevant and appropriate requirements were considered for PCBs. No specific applicable or relevant and appropriate requirements were considered for the other eight COECs in this analysis. The PCB cleanup levels in Title 40 of the *Code of Federal Regulations* Section 761.61(a)(4) (promulgated under the Toxic Substances Control Act [Title 15 of the *United States Code* Sections 2601-2693) were determined to be applicable or relevant and appropriate requirements for sediment at the Northern Channel. Under Title 40 of the *Code of Federal Regulations* Section 761.61(a)(4)(i)(A), the cleanup goal for bulk PCB remediation waste in high-occupancy areas is less than or equal to 1 milligram per kilogram (mg/kg) without further conditions such as the area being covered with a cap. The cleanup goal for bulk PCB remediation waste in low-occupancy areas such as the Northern Channel is less than or equal to 25 mg/kg under Title 40 of the *Code of Federal Regulations* Section 761.61(a)(4)(i)(B)(1). However, as stated in the National Oil and Hazardous Substances Pollution Contingency Plan (Title 40 of the *Code of Federal Regulations* Section 300.430), requirements include not only evaluating risks to human health, but also the environment. Therefore, the 25-mg/kg goal is not sufficiently protective of ecological receptors, so the cleanup goal is set at a lower concentration based on the results of the ecological risk assessment presented in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003). According to the Toxic Substances Control Act [Title 40 *Code of Federal Regulations* Section 761.61(a)(4)(vi)], more stringent cleanup goals may be required based on proximity to areas such as endangered species habitats, estuaries, and wetlands.

7.4 Summary of Cleanup Goals for Sediment and Soil

The following cleanup goals were developed for each COEC in sediment in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003):

- Total PCBs: 0.35 mg/kg (or 350 micrograms per kilogram)
- Total DDT: 0.0648 mg/kg (or 64.8 micrograms per kilogram)
- Total Chlordane: 0.931 mg/kg (or 931 micrograms per kilogram)
- Cadmium: 184 mg/kg
- Lead: 173 mg/kg

- Mercury: 1.52 mg/kg
- Selenium: 0.926 mg/kg
- Silver: 13.7 mg/kg
- Zinc: 720 mg/kg

The Navy is addressing total dichlorodiphenyltrichloroethane and total chlordane as part of the selected remedy at Site 27 because these chemicals are the result of runoff from other areas. Additionally, cleanup goals for soil were developed to evaluate COECs because the berms contain soil. Rare, random detections of COECs led to the decision by the Navy and the U.S. Environmental Protection Agency (EPA) to use residential preliminary remediation goals for soil (EPA 2004). The following residential preliminary remediation goals were identified for soil in the berms along the Northern Channel:

- Total PCBs: 0.22 mg/kg (or 220 micrograms per kilogram)
- Dichlorodiphenyldichloroethane: 2.4 mg/kg (or 2,400 micrograms per kilogram);
  Dichlorodiphenyldichloroethene: 1.7 mg/kg (or 1,700 micrograms per kilogram;
  Dichlorodiphenyltrichloroethane: 1.7 mg/kg (or 1,700 micrograms per kilogram)
- Total Chlordane: 1.6 mg/kg (or 1,600 micrograms per kilogram)
- Cadmium: 37 mg/kg
- Lead: 150 mg/kg (California-modified preliminary remediation goal)
- Mercury: 23 mg/kg
- Selenium: 390 mg/kg
- Silver: 390 mg/kg
- Zinc: 23,000 mg/kg

7.5 BASIS FOR ACTION

Based on the characterization of risks at the site, the remedy selected in this Record of Decision is necessary to protect the ecological receptors from actual or threatened releases of hazardous substances in the Northern Channel and related areas.

8.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives are medium-specific goals to be attained to reduce risk to an acceptable level. Remedial action objectives for sediment were developed in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA 1988, 1994). In addition, applicable or relevant and appropriate requirements were considered in developing the final remedial action objectives. Tables 3, 4, and 5 identify the chemical-, location-, and action-specific applicable or relevant and appropriate requirements. A detailed discussion of these applicable or relevant and appropriate requirements is provided in Appendix C.

The remedial action objectives for the response action described in this Record of Decision are to reduce the direct exposure of ecological receptors to total polychlorinated biphenyls, pesticides (total dichlorodiphenyltrichloroethane and total chlordane), and metals in sediment to levels that are protective of birds in the Northern Channel and related areas. The Navy is addressing total dichlorodiphenyltrichloroethane and total chlordane as part of the selected remedy at Site 27 because these chemicals are the result of runoff from other areas. Sediment cleanup goals identified for each COEC below are expected to provide adequate protection of ecological receptors and, indirectly, human health in the Northern Channel and related areas:

- Total polychlorinated biphenyls: 0.35 milligram per kilogram (or 350 micrograms per kilogram)
- Total dichlorodiphenyltrichloroethane: 0.0648 milligram per kilogram (or 64.8 micrograms per kilogram)
- Total chlordane: 0.931 milligram per kilogram (or 931 micrograms per kilogram)
- Cadmium: 184 milligrams per kilogram
- Lead: 173 milligrams per kilogram
- Mercury: 1.52 milligrams per kilogram
- Selenium: 0.926 milligrams per kilogram
- Silver: 13.7 milligrams per kilogram
- Zinc: 720 milligrams per kilogram

No concentrations of chlordane exceeded the sediment cleanup goal; however, the selected remedy will further reduce chlordane concentrations in sediment, thus reducing chlordane concentrations in overlying surface water, which contributed to unacceptable risk to birds. The preliminary remediation goals for residential use were used as cleanup goals for total PCBs and the other COECs in soil in the berms along the Northern Channel (EPA 2004). Residential preliminary remediation goals are expected to provide adequate protection for humans who might be exposed to the soil in the future.

Remedial alternatives were considered that would meet the sediment cleanup goals from the Northern Channel and associated ditches, as well as the debris pile. Sediment with concentrations of COECs greater than the sediment cleanup goals and soil along the Northern Channel berms with concentrations greater than the residential PRGs will be excavated under the selected remedy.

TABLE 3: FEDERAL AND STATE CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirement Determination[a]	Comments
Federal Requirements				
Toxic Substances Control Act (Title 15 *United States Code*, Chapter 53, Sections 2601-2692)				
Regulates storage and disposal of PCBs	Soil, debris, sludge or dredged materials contaminated with PCBs.	PCB remediation waste cleanup standards, Title 40 *Code of Federal Regulations* Section 761.61 (a)(4)(i)	Relevant and Appropriate	The cleanup goal for bulk remediation waste in high occupancy areas is less than or equal to 1 part per million (or 1 milligram per kilogram) without further conditions. The cleanup goal for bulk PCB remediation waste in low-occupancy areas is less than or equal to 25 mg/kg. Under Toxic Substances Control Act, Title 40 *Code of Federal Regulations* Section 761.61(a)(4)(vi), more stringent cleanup levels may be required based on the proximity to areas such as endangered species habitats, estuaries, and wetlands. Based on the results of the ecological risk assessment conducted for this site , a lower cleanup goal for sediments was selected for PCBs. The cleanup goal is 350 micrograms per kilogram (or 0.35 milligram per kilogram) for total PCBs in sediments. The Navy and the U.S. Environmental Protection Agency have agreed to use residential preliminary remediation goals as the cleanup goal for PCBs and other chemicals of ecological concern in soil.
State Requirements				
State and Regional Water Quality Control Boards				
Describes water basins and establishes beneficial uses	Impact to groundwater.	Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) (*Water Code* Section 13240)	Applicable	The substantive requirements of the following provisions of Chapter 2 of the Basin Plan are applicable requirements: "Definitions of Beneficial Uses," "Present and Potential Beneficial Uses, Surface Waters," and "the Santa Clara Valley Basin section of Table 2-9."

Notes:

a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 5.

PCB Polychlorinated biphenyl

Source:

San Francisco Bay Regional Water Quality Control Board. 1995. "Water Quality Control Plan, San Francisco Bay Basin, Region 2." December.

TABLE 4: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements					
Coastal Zone Management Act (Title 16 USC Section 1451-1464)					
Within coastal zone[b]	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone including lands there under and adjacent shore land.	Title 16 USC Section 1456(c) Title 15 CFR Part 930	Relevant and Appropriate	The remedial action will have some short-term impact on the coastal zone, in general, and marshes, specifically. The affected areas will be restored to their current use.
Endangered Species Act of 1973 (Title 16 USC Sections 1531-1543)					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition an improvement are implemented.	Determination of effect upon endangered or threatened species or its habitat. Critical habitat upon which endangered species or threatened species depend.	Title 16 USC Section 1536(a), (h)(1)(B)	Relevant and Appropriate	Although no endangered species were identified in the area of the Northern Channel, pickleweed was identified along the slopes of the Northern Channel. The salt marsh harvest mouse, a federal and state endangered and threatened species, may visit the pickleweed in the Northern Channel areas. In addition, the California brown pelican, American peregrine falcon, California least tern, and the California clapper rail may visit the Northern Channel. In accordance with 50 CFR Part 17, Subpart B and Part 226 Subparts B, C, and D, no critical habitat exists in the Northern Channel area.

TABLE 4: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Migratory Bird Treaty Act of 1972 (Title 16 USC Sections 703–712)					
Migratory bird area	Protects almost all species of native migratory birds in the United States from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	Title 16 USC Section 703	Relevant and Appropriate	The substantive portions are relevant and appropriate as migratory birds have been observed at the site.
Rivers and Harbors Act of 1899 (Title 33 USC Sections 401-413)					
Navigable waters	Permits required for structures or work in or affecting navigable waters.	Activities affecting navigable waters.	Title 33 USC Section 403 Title 33 CFR Part 322	Relevant and Appropriate	The substantive provisions of this requirement are relevant and appropriate requirements for dredging which may affect navigable waters.
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344)					
Wetland	Action to prohibit discharge of dredged of fill material into wetland without permit	Wetland as defined by Executive Order No. 11990 Section 7.	Title 33 USC Section 1344 Title 40 CFR Section 230.10	Applicable	The substantive provisions are applicable for the discharge of dredged or fill material to a wetland.
Executive Order No. 11990, Protection of Wetlands					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands.	Wetland meeting definition of Section 7.	Title 40 CFR Section 6.302(a)	Applicable	The substantive provisions of Title 40 CFR Section 602(a) are applicable requirements for the response action. The Navy will minimize the impacts to wetlands when implementing the response action.

TABLE 4: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
State Requirements					
California Endangered Species Act (*California Fish and Game Code* Sections 2050-2116)					
Endangered species habitat	No person shall import, export, take, possess, or sell any endangered or threatened species or par or product thereof.	Threatened or endangered species determination on or before January 1, 1985 or a candidate species with proper notification.	*California Fish and Game Code* Section 2080	Relevant and Appropriate	Although no endangered species were identified in the area of the Northern Channel, pickleweed was identified along the slopes of the Northern Channel. The salt marsh harvest mouse, a federal and state endangered and threatened species may visit or reside in the pickleweed in the Northern Channel areas.
California Fish and Game Code					
Waters of the state	Prohibits depositing in, permitting to pass into, placing where it can pass into waters of the state petroleum acid, coal or any substance or material deleterious to fish, plant life or bird life.	Deposit of material deleterious to fish, plant or bird life.	*California Fish and Game Code* Section 5650(a)	Relevant and Appropriate	The substantive provisions of 5650(a) are relevant and appropriate.

Notes:

a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 5.

b Coastal zone is defined as coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches.

CFR *Code of Federal Regulations*
USC *United States Code*

TABLE 5: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements					
Resource Conservation and Recovery Act (Title 42 USC, Chapter 82, Sections 6901-6991[i])					
Excavation	Definition of RCRA hazardous waste.	Soil and water	Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1) and 66261.100	Applicable	The requirements of Title 22 CCR, Division 4.5, Chapter 14 are applicable for determining whether excavated material contains hazardous waste. These requirements may also be relevant and appropriate to excavated material that is similar or identical to RCRA hazardous waste or non-RCRA hazardous waste
Hazardous waste accumulation	On-site hazardous waste accumulation is allowed for up to 90 days as long as the waste is stored in containers or tanks, on drip pads, inside buildings, is labeled and dated, etc.	Accumulate hazardous waste	Title 22 CCR Section 66262.34	Applicable	These requirements are applicable if hazardous waste is generated and accumulated on-site before transport.
Land disposal	Requires generators of hazardous waste to determine if waste has to be treated before it can be land disposed. Requires generators to notify treatment facility if a waste is subject to land disposal restrictions and does not meet applicable treatment standards. If the waste meets treatment standards, generators must sign a certification.	Hazardous waste land disposal	Title 22 Sections 66268.1(f), 66268.7	Applicable	These requirements are applicable if hazardous waste is to be land disposed.

TABLE 5: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Resource Conservation and Recovery Act (Title 42 USC, Chapter 82, Sections 6901-6991[i])					
Pretransport requirements	Hazardous waste must be packaged in accordance with DOT regulations before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.30	Applicable	These requirements are applicable if hazardous waste is to be transported.
	Hazardous waste must be labeled in accordance with DOT regulations before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.31	Applicable	These requirements are applicable if hazardous waste is to be transported.
	Provides requirements for marking hazardous waste before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.32	Applicable	These requirements are applicable if hazardous waste is to be transported.
	A generator must ensure that the transport vehicle is correctly placarded prior to transport of hazardous waste.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.33	Applicable	These requirements are applicable if hazardous waste is to be transported.
	Requires preparation of a manifest for transport of hazardous waste off-site.	Any operation where hazardous waste is generated	Title 22 CCR Sections 66262.20-66262.23	Applicable	These requirements are applicable if hazardous waste is to be transported.

TABLE 5: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Clean Air Act (Title 42 USC Section 7401 et seq.) (Continued)					
Excavation	Prohibits emissions that are as dark as or darker than No.1 on the Ringelmann Chart and sets forth opacity limitations.	Excavation	BAAQMD Regulations 6, Regulations 6-301 and 6-302	Applicable	These requirements are applicable for excavation.
	Prohibits the emission of particles in sufficient number to cause annoyance,	Release of particles	BAAQMD Regulation 6-305	Applicable	This requirement is applicable for excavation.
	Provides requirements for maintaining, covering and stock-piling excavated soil.	Soil stockpile	BAAQMD Regulation 8, Rule 40	Applicable	These requirements are applicable for excavation.
Federal Hazardous Materials Transportation Law (Title 49 USC Sections 5101-5127)					
Transportation of hazardous material Title 49 USC Sections 5101-5127	Sets forth requirements for transporting hazardous waste including representations that containers are safe, prohibitions on altering labels, marking requirements, labeling requirements and placarding requirements.	Interstate carriers transporting hazardous waste and substance by motor vehicle	Title 49 CFR Sections 171.2(f), 171.2(g), 172.300, 172.301,172.302, 172.303172.304, 172.312, 172.400, 172.504	Relevant and Appropriate	Relevant and appropriate for transporting hazardous materials on-site.
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344)					
Discharge of water	Establishes the requirements for an National Pollutant Discharge Elimination System permit for discharge to waters of the United States.	Discharge of waster	Title 40 CFR Part 122 Subpart C	Relevant and Appropriate	Water generated while one section of the Northern Channel is dewatered will be discharged to another section of the channel. The substantive requirement of Title 40 CFR Part 122 Subpart C will be followed in addressing the new point discharge.

TABLE 5: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344) (Continued)					
Stormwater discharge	Order 99-08-DQW is the State of California general permit for stormwater discharge from construction. It requires use of best management practices to reduce pollutants.	Stormwater discharge	State Water Resources Control Board Order 99-08 adopted pursuant to Title 40 CFR Part 122, Subpart C	Relevant and Appropriate	Order 99-08—DQW applies to excavation activities that affect at least 1 acre. Pursuant to the substantive permit requirements, best management practices will be taken to prevent construction pollutants from contacting stormwater and keep erosions products from moving off site.
Toxic Substances Control Act (15 USC Chapter 53 Sections 2601-2692)					
Disposal of PCBs	Provides options for disposing of PCB remediation waste and requirements to implement each option.	Remedial actions involving PCBs	Title 40 CFR Section 761.61	Relevant and Appropriate	Excavated sediment containing PCBs may be disposed of in accordance with the requirements of this regulation.
Storage of PCB remediation waste	Establishes requirements for storage of PCB remediation wastes released into the environment.	Storage of PCBs	Title 40 CFR Sections 761.65(c)(4) and (c)(9)	Relevant and Appropriate	Excavated sediment that contains PCBs may be stored on site up to 180 days. The storage area must have a liner, cover, and runon control system.
Decontamination standards for water containing PCBs	Establishes standards for the disposal of water used for decontamination of equipment used in excavation, storage, and treatment of PCB remediation waste.	Decontamination of water	Title 40 CFR Section 761.79(b)(1)	Relevant and Appropriate	The decontamination standard for PCBs is less than 3 micrograms per liter for water discharges to a publicly owned treatment works or to navigable waters, or less than or equal to 0.5 microgram per liter PCBs for unrestricted use.

TABLE 5: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
State Requirements					
Characterization of waste	Definition of "non-RCRA hazardous waste."	Waste.	Title 22 CCR Sections 66261.24(a)(2) and 66261.101	Applicable	Applicable for determining whether a waste is a non-RCRA hazardous waste.
	Contains criteria for characterizing the waste as either designated, nonhazardous, or inert waste.	Designated waste	Title 27 CCR Sections 20210, 20220 and 20230	Applicable	Representative samples of excavated sediment must be tested to identify appropriate disposal requirements.
Stormwater discharge	Establishes the state stormwater permit program and sets forth substantive conditions for construction sites larger than 1 acre.	Stormwater discharge	State Water Resources Control Board Order 99-08 adopted pursuant to Title 40 CFR Part 122, Subpart C	Relevant and Appropriate	Order 99-08—DQW applies to excavation activities that affect at least 1 acre. Pursuant to the substantive permit requirements, best management practices will be taken to prevent construction pollutants from contacting stormwater and keep erosions products from moving off site.

Notes:

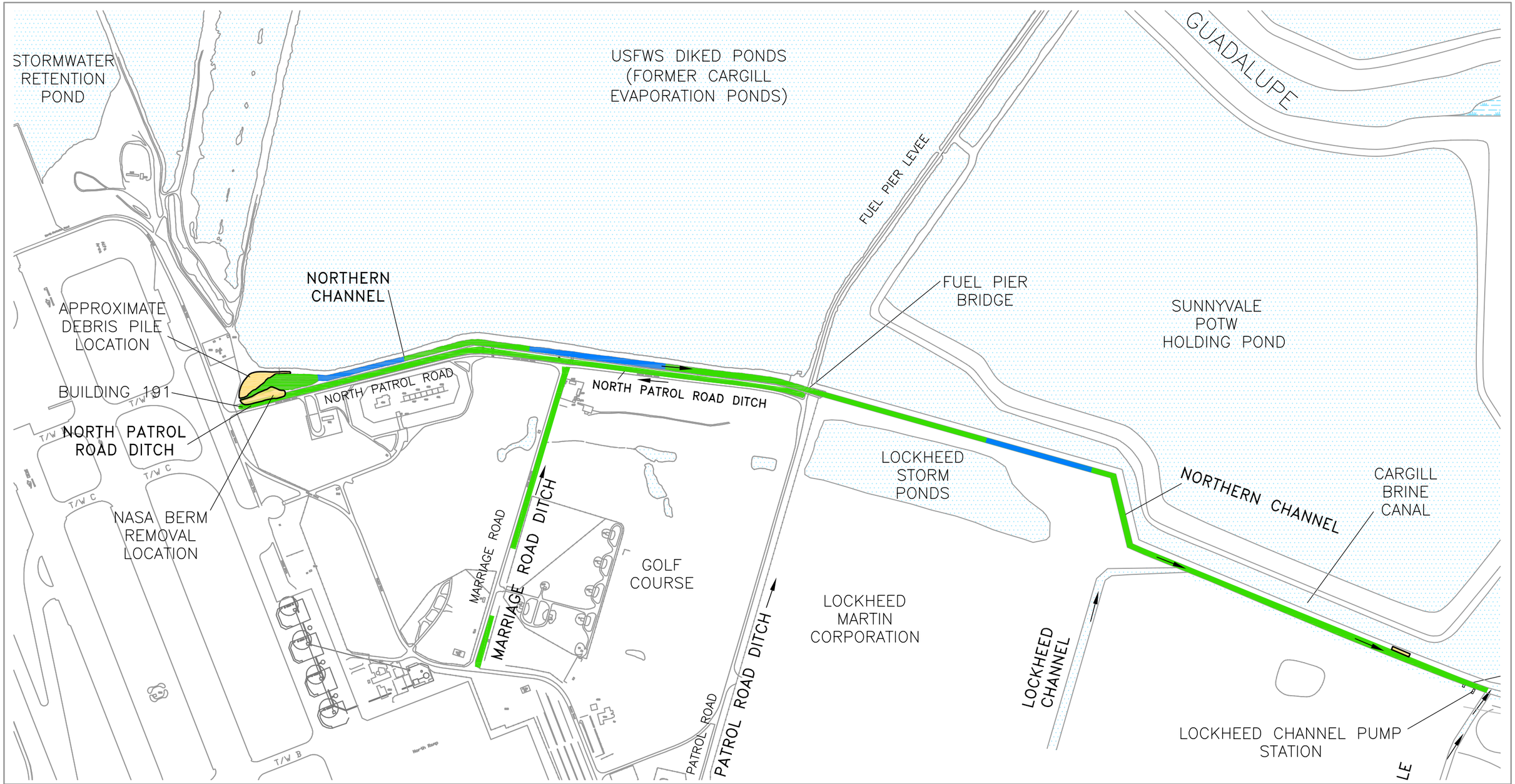
a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 4.

BAAQMD Bay Area Air Quality Management District
CCR *California Code of Regulations*
CFR *Code of Federal Regulations*
DOT Department of Transportation
PCB Polychlorinated biphenyl
RCRA Resource Conservation and Recovery Act
USC *United States Code*

The excavation will extend according to the following limits (see Figure 8):

- Contaminated sediments from the entire length of the Northern Channel.
- Contaminated sediments from the entire length of the North Patrol Road Ditch.
- Contaminated sediments from approximately a 1,700-foot length of the Marriage Road Ditch.
- Contaminated sediments from the debris pile.
- Contaminated soil from (1) the western end of the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191 (Transect 1), and (2) the Lockheed Martin Corporation berm near the eastern end of the Northern Channel (Transect 15).

The remedial action objectives and associated cleanup goals comply with the requirements in the National Oil and Hazardous Substances Pollution Contingency Plan and the Comprehensive Environmental Response, Compensation, and Liability Act. More details on the selected remedy and excavation limits are provided in Section 12.0 of this Record of Decision.



DIRECTION OF FLOW

SURFACE WATER

MARSH LAND

PROPOSED REMOVAL TO CLAY LAYER (INCLUDING REMOVAL OF DEBRIS PILE)

PROPOSED REMOVAL TO 1 FOOT BELOW SURFACE OF SEDIMENT

PROPOSED REMOVAL OF SELECTED AREA OF THE NORTHERN CHANNEL BERM

Notes:
POTW Publicly owned treatment works
USFWS U.S. Fish and Wildlife Service

500 0 500 1,000
Scale: 1" = 1,000'

SulTech

Former Naval Air Station Moffett Field
U.S. Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 8
PROPOSED EXCAVATION AREAS AT NORTHERN CHANNEL AND RELATED AREAS
Record of Decision
Site 27 - Northern Channel

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9.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

The six remedial alternatives below were identified and evaluated in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003) using the nine criteria from the National Oil and Hazardous Substances Pollution Contingency Plan for remedial alternatives (see Section 10.0).

- Alternative 1: No action
- Alternative 2: Excavating contaminated sediment and soil, dewatering sediment, transporting excavated sediment, soil, and debris off site for disposal, and restoring habitat
- Alternative 3A: Excavating contaminated sediment and soil, treating excavated material through bioremediation and stabilization, transporting treated material off site for disposal, and restoring habitat.
- Alternative 3B: Excavating contaminated sediment and soil, treating excavated material through stabilization, transporting treated material off site for disposal, and restoring habitat.
- Alternative 4A: Capping contaminated sediment and soil in-place, enacting institutional controls to maintain the cap, and restoring habitat.
- Alternative 4B: Capping contaminated sediment at the debris pile, excavating contaminated sediments, transporting excavated material off site for disposal, enacting institutional controls to maintain the cap, and restoring habitat.

The remedial alternatives were developed to reduce the concentrations of, and potential for exposure to, total polychlorinated biphenyls, total dichlorodiphenyltrichloroethane, total chlordane, cadmium, lead, mercury, selenium, silver, and zinc in sediment and soil. The remedial action objectives and the identified remediation areas were evaluated together to identify general response actions that are feasible for the types of contaminated media, the chemical concentrations to be attained by the remediation, the contaminant exposure pathways to be addressed, and the volume of the medium to be remediated.

The following sections summarize the key elements of each remedial alternative.

9.1 ALTERNATIVE 1: NO ACTION

Under Alternative 1, no cleanup action or monitoring would be conducted. The Comprehensive Environmental Response, Compensation, and Liability Act requires that the no-action alternative be evaluated to establish a baseline for comparison with other alternatives that involve cleanup action. Under Alternative 1, the site would be left in its current condition, and there would be no associated costs.

The following key elements below were identified for Alternative 1.

- **Operation and Maintenance:** None
- **Long-Term Reliability:** None
- **Monitoring Requirements:** None
- **Applicable or Relevant and Appropriate Requirements:** Chemical- and location-specific applicable or relevant and appropriate requirements for Alternative 1 were identified in Tables 3 and 4 and discussed in Appendix C; there are no action-specific applicable or relevant and appropriate requirements for the no-action alternative
- **Estimated Time for Construction and Implementation:** None
- **Estimated Costs:**
  - Capital: $0
  - Total Operation and Maintenance: $0
  - Estimated 30-Year Total Cost: $0
- **Expected Outcome of Alternative:** Under this alternative, no action would be taken to treat or remove contaminated sediments. No construction or operation of remedial measures would be required, and no long-term monitoring would be conducted.
- **Land Use, Water Use, or Other Impacts:** This alternative would result in continued use of the area for stormwater drainage. No action may pose risk to human health and ecological receptors. Specifically, risk may be posed from potentially harmful levels of chemicals of ecological concern (COEC) that are present in sediments and soil. As a result, future use of portions of the Northern Channel as a recreational area may also be limited.

9.2 ALTERNATIVE 2: EXCAVATION AND OFF-SITE DISPOSAL (SELECTED REMEDY)

Alternative 2 consists of excavating contaminated sediments from the Northern Channel, associated ditches, and the debris pile, and soil from the berms near the western end of the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191, conducting confirmation sampling, transporting excavated material off site to an appropriate disposal facility, and restoring the area following the remedial action. The key elements below were identified for Alternative 2.

- **Operation and Maintenance:** None

- **Long-Term Reliability:** Excavation and off-site disposal of contaminated sediment and soil provides a long-term, effective, and permanent remedy at the Northern Channel and ditches. COECs detected at concentrations that exceed cleanup goals would be excavated and removed to a landfill, permanently eliminating risks for both human health and ecological receptors associated with contaminated sediment and soil.

- **Monitoring Requirements:** None.

- **Applicable or Relevant and Appropriate Requirements:** Applicable or relevant and appropriate requirements were identified in Tables 3, 4, and 5 and discussed in Appendix C.

- **Estimated Time for Construction and Implementation:** Up to 3 months

- **Estimated Costs:**

  - Capital: $6,761,070
  - Total Operation and Maintenance: $0
  - Estimated 30-Year Total Cost: $6,761,070

- **Expected Outcome of Alternative:** This alternative is expected to result in achieving the remedial action objective of limiting the exposure of ecological receptors to COECs in sediments in the Northern Channel, associated ditches, and the debris pile and in soil at the berms. This alternative is protective of human and ecological receptors reasonably anticipated at the site.

- **Land Use, Water Use, or Other Impacts:** This remedial alternative would result in continued use of the area for stormwater drainage and as a recreational area because human and ecological receptors would be protected from potentially harmful levels of COECs that are currently present in sediment and soil.

The following sections discuss each phase of Alternative 2.

9.2.1 Excavation

Pre-excavation activities would include (1) conducting a biological assessment of the area to identify threatened or endangered species, (2) developing a stormwater management plan specific to construction, (3) establishing stable and level access paths for equipment and vehicles, and (4) dewatering of the Northern Channel and associated ditches. The remedial design would identify appropriate measures to avoid or minimize impacts on wetlands during the remedial action. National Aeronautics and Space Administration is conducting appropriate

biological surveys in consultation with U.S. Fish and Wildlife Service and California Department of Fish and Game.

The approximate total volume of sediments and soil to be excavated would be 65,600 cubic yards, which would be disposed of properly in an appropriate landfill. Water would be diverted, the channel and ditches would be dewatered, and the contaminated sediments would be excavated.

All sediments would be dewatered as required before they are transported off site using best management practices to minimize impacts to the area. It is anticipated that all sediment and soil will be disposed of in Class I and II landfills. Excavated sediments and soil would be tested, transported, and disposed of off site at a permitted facility.

9.2.2 Confirmation Sampling

After excavation, samples would be collected to confirm that contaminated soil and sediments have been removed and that cleanup goals have been met.

9.2.3 Site Restoration

The site would be restored when confirmation sampling was complete. Clean soil brought on site as backfill would be similar to existing soil and would be transported in trucks in accordance with a transportation plan to be developed as part of the cleanup design. The berms would be regraded as necessary.

Efforts would be made to obtain backfill soil that is generally free from noxious weeds. Wetland plant species would then be reintroduced, where necessary, based on a revegetation plan that would also be prepared as part of the cleanup design. Only the excavated berms will be revegetated. A trained wetlands biologist would be present to monitor all on-site construction.

9.2.4 Institutional Controls

Institutional controls are not required under Alternative 2.

9.2.5 Five-Year Review

Five-year reviews are a statutory requirement for remedial alternatives that include restricted use to eliminate exposure pathways and receptor contact with contaminants of concern. A five-year review would not be required under Alternative 2.

9.3 ALTERNATIVES 3A AND 3B: EXCAVATION WITH EX SITU BIOREMEDIATION TREATMENT (3A) OR SOLIDIFICATION (3B) AND OFF-SITE DISPOSAL

These alternatives involve excavating the same areas as described under Alternative 2. The alternatives also involve treatment of excavated sediment and soil using either bioremediation to treat organic chemicals and stabilization to treat metals (Alternative 3A) or stabilization to treat only metals (Alternative 3B), off-site disposal of sediment and soil (in a Class I or Class II landfill depending on the concentration of COECs after treatment), and confirmation sampling. The key elements below were identified for Alternatives 3A and 3B.

- **Operation and Maintenance:** None
- **Long-Term Reliability:** COECs detected at concentrations that exceed cleanup goals would be permanently removed from the Northern Channel and ditches, thereby eliminating risks associated with contaminated sediment for both human health and ecological receptors.
- **Monitoring Requirements:** None.
- **Applicable or Relevant and Appropriate Requirements:** Applicable or relevant and appropriate requirements were identified in Tables 3, 4, and 5 and in Appendix C.
- **Estimated Time for Construction and Implementation:** Up to 9 months for Alternative 3A, and up to 7 months for Alternative 3B.
- **Estimated Costs:**
  - Capital: $6,552,000 for Alternative 3A, and $6,395,000 for Alternative 3B
  - Total Operation and Maintenance: $0 for Alternatives 3A and 3B
  - Estimated 30-Year Total Cost: $6,552,000 for Alternative 3A, and $6,395,000 for Alternative 3B
- **Expected Outcome of Alternative:** These alternatives are expected to result in achieving the remedial action objective of limiting the exposure of ecological receptors to COECs in sediments in the Northern Channel, associated ditches, and the debris pile and in soil at the berms. These alternatives are protective of human and ecological receptors reasonably anticipated at the site.
- **Land Use, Water Use, Other Impacts:** This remedy would result in continued use of the area for stormwater drainage and as a recreational area because human and ecological receptors would be protected from potentially harmful levels of COECs that are currently present in sediment and soil.

The following sections discuss each phase of Alternatives 3A and 3B.

9.3.1 Excavation

Pre-excavation activities would include (1) performing a biological assessment of the area to identify threatened or endangered species, (2) developing a stormwater management plan specific to construction, (3) establishing stable and level access paths for equipment and vehicles, and (4) dewatering of the Northern Channel and associated ditches. The remedial design would identify appropriate measures to avoid or minimize impacts on wetlands during the remedial action. National Aeronautics and Space Administration is conducting appropriate biological surveys in consultation with U.S. Fish and Wildlife Service and California Department of Fish and Game.

An estimated 65,600 cubic yards of sediment and soil would be removed from Site 27. Sediment and soil would be removed as described under Alternative 2. Both alternatives call for off-site disposal of sediment and soil in an appropriate landfill after treatment. It is anticipated that all soil would be disposed of in a Class II landfill under Alternative 3A, and that soil would be disposed of in Class I and II landfills under Alternative 3B.

9.3.2 Treatment

Under Alternative 3A, excavated soil would be treated using ex situ bioremediation and stabilization. Soil and sediment that contain COECs at concentrations that exceed cleanup goals would be treated biologically in a temporary on-site treatment unit using naturally occurring microorganisms. Although these microorganisms have the potential to metabolize polychlorinated biphenyls and dichlorodiphenyltrichloroethane, it has not been proven that these organisms can reduce concentrations of these chemicals to below cleanup goals. However, biological treatment would not lower the concentrations of metals. Therefore, after soil or sediment has been biologically treated, if required, soil and sediment that contains metals would be stabilized.

Under Alternative 3B, excavated soil would be treated using stabilization only. Organic COECs at concentrations that exceed cleanup goals would not be treated; therefore, soil and sediment that contain concentrations of organic COECs that exceed cleanup goals would require disposal.

9.3.3 Confirmation Sampling

After excavation, confirmation samples would be collected as described in Alternative 2. In addition, treated soil and sediment would be sampled to evaluate treatment performance.

9.3.4 Site Restoration

After the excavation is complete, the site would be restored as described for Alternative 2.

9.3.5 Institutional Controls

As with Alternative 2, institutional controls would not be required under Alternatives 3A and 3B.

9.3.6 Five-Year Review

Five-year reviews are statutory requirement reviews for remedial alternatives that include restricted use to eliminate exposure pathways and receptor contact with contaminants of concern. A five-year review would not be required under Alternatives 3A and 3B because no contamination would be left in place.

9.4 ALTERNATIVES 4A AND 4B: PLACEMENT OF A CONCRETE CAP AND GEOMEMBRANE COVER (4A) OR PLACEMENT OF A GEOSYNTHETIC CLAY LINER AND EXCAVATION (4B)

These alternatives involve (1) capping sediments in the Northern Channel, ditches, and debris pile and soils in the berms at locations where concentrations of COECs exceed cleanup goals with a concrete cap and geomembrane (Alternative 4A), or (2) only capping soils in the berms and sediments in the debris pile with a geosynthetic clay layer and excavating and disposing of the sediments in the Northern Channel and associated ditches (Alternative 4B). The key elements below were identified for Alternatives 4A and 4B.

- **Operation and Maintenance:** Inspect and repair the cap; conduct five-year reviews

- **Long-Term Reliability:** Alternative 4A (concrete cap and geomembrane) would be effective for long-term protection of human health and the environment. Contaminated sediments at the Northern Channel and associated ditches would be isolated from human and ecological receptors through capping and institutional controls. However, continued long-term effectiveness depends largely on proper maintenance of the cap. Long-term effectiveness also would depend on potential changes to the drainage network. The concrete cap requires little maintenance because it inhibits burrowing organisms. Institutional controls contribute to long-term protectiveness of human health and the environment because they help maintain the integrity of the cap. With institutional controls in place and followed, the life span of the cap is expected to be 30 to 50 years.

  Long-term effectiveness with the geosynthetic clay liner portion of Alternative 4B is similar to the long-term effectiveness of Alternative 4A. The cap would require regular inspection and maintenance. The excavation portion of Alternative 4B would provide a long-term effective and permanent remedy at the Northern Channel and ditches.

- **Monitoring Requirements:** Integrity of the cap would be monitored through regular inspections and five-year reviews.

- **Applicable or Relevant and Appropriate Requirements:** Applicable or relevant and appropriate requirements were identified in Tables 3, 4, and 5, and discussed in Appendix C.

- **Estimated Time for Construction and Implementation:** Up to 3 months for both alternatives.

- **Estimated Costs:**

  - Capital: $9,037,000 for Alternative 4A, and $6,116,000 for Alternative 4B
  - Total Operation and Maintenance (over 30-year period at discount factor of 5.1 percent): $288,000 for Alternative 4A, and $212,000 for Alternative 4B. For both alternatives operation and maintenance costs include monitoring of institutional controls, maintaining the cap, and preparing a five-year review report.
  - Estimated 30-Year Total Cost: $9,325,000 for Alternative 4A, and $6,328,000 for Alternative 4B

- **Expected Outcome of Alternative:** These alternatives are expected to achieve the remedial action objective of limiting the exposure of ecological receptors to COECs in sediments in the Northern Channel, associated ditches, and the debris pile. This alternative is protective of human and ecological receptors reasonably anticipated at Site 27. Alternative 4A would reduce the capacity of the Northern Channel and ditches. Alternative 4B would increase the capacity of the channel and ditches.

- **Land Use, Water Use, Other Impacts:** These remedial alternatives would result in continued use of the area for stormwater drainage and as a recreational area because human and ecological receptors would be protected from potentially harmful levels of COECs that are currently present in sediments. However, the concrete cap would reduce the capacity of the Northern Channel and ditches and would limit options for any future drainage modifications.

The following sections discuss each phase of Alternatives 4A and 4B.

9.4.1 Capping

Pre-excavation activities would include (1) performing a biological assessment of the area to identify threatened or endangered species, (2) developing a stormwater management plan specific to construction, and (3) establishing stable and level access paths for equipment and vehicles. The remedial design would identify appropriate measures to avoid or minimize impacts on wetlands during the remedial action. National Aeronautics and Space Administration is also conducting appropriate biological surveys in consultation with U.S. Fish and Wildlife Service and California Department of Fish and Game.

Alternative 4A involves construction and placement of a 4-inch-thick concrete cap along the bottom of the Northern Channel and drainage ditches, and capping soils and sediments that contain COECs at concentrations above cleanup goals along the berm of the Northern Channel and within the debris pile using a geosynthetic clay liner. This alternative could be constructed without dewatering the channels. However, roads on the top of the berms would be improved to support heavy equipment. The concrete cap would be designed and placed to minimize the opportunity for the concrete cap to slide down the slopes and potentially float as a result of hydrostatic pressure differences.

Alternative 4B involves capping soils and sediments that contain COECs at concentrations above cleanup goals along the berm of the Northern Channel and within the debris pile using a geosynthetic clay liner, as well as excavating and disposing of contaminated sediments that contain COECs at concentrations above cleanup goals from the Northern Channel and the associated drainage ditches. The total volume of soil and sediment to be excavated would be about 54,965 bulk cubic yards. Excavated soil and sediment would be disposed of properly in a landfill.

9.4.2 Confirmation Sampling

After excavation, samples would be collected to ensure proper disposal and to confirm that the cleanup goals have been met.

9.4.3 Site Restoration

The site would be restored when capping was complete. Wetland plant species would then be reintroduced, where necessary, based on a revegetation plan that would be prepared as part of the cleanup design. Only the berms would be revegetated. A trained wetlands biologist would be present to monitor all on-site construction.

9.4.4 Institutional Controls

After cap completion, institutional controls would be developed to limit activities that might impair its integrity (such as dredging the channel or ditches). The cap would require routine inspections and repair when necessary.

9.4.5 Five-Year Review

A five-year review process is a statutory requirement for remedial alternatives that include restricted use to eliminate exposure pathways and receptor contact with contaminants of concern. The five-year review would be used to address performance of the remedy, including maintenance, monitoring, and evaluation and would focus on assessing if the remedy is continuing to protect human health and the environment and is functioning as intended.

10.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section summarizes the comparative analysis of the remedial alternatives that was conducted as part of the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003). The National Oil and Hazardous Substances Pollution Contingency Plan requires that the relative performance of each alternative be evaluated against nine criteria of Title 40 of the *Code of Federal Regulations* Section 300.430(e)(9)(iii). The nine criteria are briefly described below.

1. Overall Protection of Human Health and the Environment: Determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements: Evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-Term Effectiveness and Permanence: Considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Short-Term Effectiveness: Considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

5. Reduction of Toxicity, Mobility, or Volume Through Treatment: Evaluates an alternative's use of treatment to reduce the harmful effects of principal chemicals, the chemical's ability to move in the environment, and the amount of contamination present.

6. Implementability: Considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost: Includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate with a range of plus 50 to minus 30 percent.

8. State/Support Agency Acceptance: Considers whether the state agrees with U.S. Department of the Navy's analysis and recommendations, as described in the remedial investigation, feasibility study, and proposed plan.

9. Community Acceptance: Considers whether the local community agrees with Navy analyses and the selected alternative. Comments received on the proposed plan are an important indicator of community acceptance.

Table 6 summarizes the acceptability of each alternative evaluated using the nine criteria described above. The following subsections describe the comparative analysis of each alternative.

TABLE 6: COMPARATIVE EVALUATION OF THE REMEDIAL ALTERNATIVES
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Evaluation Criteria	Alternative 1: No Action	Alternative 2: Excavation and Off-Site Disposal	Alternative 3A: Excavation, Ex Situ Bioremediation/ Stabilization, and Disposal	Alternative 3B: Excavation, Stabilization and Disposal	Alternative 4A: Concrete Cap and Geomembrane Cover	Alternative 4B: Geosynthetic Clay Liner, Excavation, and Disposal
Overall Protection of Human Health and the Environment	Not Protective	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Compliance with Applicable or Relevant and Appropriate Requirements	Not Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Long-Term Effectiveness and Permanence	Not Evaluated	Most Favorable	Most Favorable	Most Favorable	Least Favorable	Acceptable
Short-Term Effectiveness	Not Evaluated	Most Favorable	Acceptable	Acceptable	Acceptable	Acceptable
Reduction of Toxicity, Mobility, or Volume Through Treatment	Not Evaluated	Acceptable	Most Favorable	Acceptable	Least Favorable	Acceptable
Implementability	Not Evaluated	Most Favorable	Acceptable	Acceptable	Least Favorable	Acceptable
Cost	Not Evaluated	Acceptable	Acceptable	Acceptable	Least Favorable	Most Favorable
State Acceptance	U.S. Environmental Protection Agency and San Francisco Bay Regional Water Quality Control Board concur with the selection of Alternative 2					
Community Acceptance	Overall, the Site 27 Proposed Plan was accepted by the public. Specific public comments and Navy responses to those comments are presented in the Responsiveness Summary, which is provided in Appendix B to this Record of Decision.					

10.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Alternative 1 (No Action) would not protect human health and the environment because contaminated soil and sediments would remain in place and the potential for exposure would not be reduced. For this reason, Alternative 1 was not considered further. Alternatives 2, 3A, 3B, 4A, and 4B would all protect human health and the environment because they remove or isolate the contaminants and eliminate the potential for direct contact with the contamination. Removal of sediment and soil is protective based on the general reduction in chemical concentrations with depth and the elimination of potential ecological exposure pathways. All of the active alternatives would meet the remedial action objective and limit the exposure of ecological receptors by reducing or isolating the chemicals in shallow soil and sediment to protective levels. Alternatives 2, 3A, 3B, 4A, and 4B are therefore considered acceptable in overall protection of human health and the environment.

10.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable or relevant and appropriate requirements from federal and state laws and regulations were evaluated for each alternative in the feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003). In this Record of Decision, two additional location-specific applicable or relevant and appropriate requirements have been added: the Migratory Bird Treaty Act and the regulations implementing Executive Order 11990 relating to wetlands (see Table 4). As summarized below, Alternatives 2, 3A, 3B, 4A, and 4B comply with all chemical-, location-, and action-specific applicable or relevant and appropriate requirements. Alternative 1, No Action, does not comply with all of the applicable or relevant and appropriate requirements.

For each of the alternatives, the substantive requirements of the following laws or regulations were considered as potential applicable or relevant and appropriate requirements: Toxic Substances Control Act, the Water Quality Control Plan (or Basin Plan), the Coastal Zone Management Act, the federal Endangered Species Act, the federal Rivers and Harbors Act, Section 404 of the Clean Water Act, including federal and state stormwater requirements, Executive Order 11990, the Migratory Bird Treaty Act, the federal Resource Conservation and Recovery Act, the federal Hazardous Materials Transportation Law, the Clean Air Act, the *California Fish and Game Code* Sections 2080 and 5650(a), and the *California Civil and Health and Safety Codes* for land-use controls.

10.2.1 Chemical-Specific Applicable or Relevant and Appropriate Requirements

The only federal chemical-specific applicable or relevant and appropriate requirements identified for the Northern Channel was the remediation waste cleanup standards for polychlorinated biphenyls in Title 40 of the *Code of Federal Regulations* Section 761.61(a)(4)(i). The cleanup goal for bulk remediation waste in high-occupancy areas is less than or equal to 1 milligrams per kilogram without further consideration and less than or equal to 25 milligrams per kilogram for low-occupancy areas such as the Northern Channel. However, the Navy determined that the

cleanup goal of 25 milligrams per kilogram was not sufficiently protective of ecological receptors; therefore, the cleanup goal was based on the results of the ecological risk assessment for the Northern Channel (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1997). This adoption of a lower cleanup goal is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (Title 40 of the *Code of Federal Regulations* Section 300.430) requirement that both human health and ecological risks be considered at any given site.

The Navy determined that the substantive requirements of the following provisions of Chapter 2 of the Basin Plan are state chemical-specific applicable or relevant and appropriate requirements (San Francisco Bay Regional Water Quality Control Board 1995):

- Definitions of beneficial uses
- Present and potential beneficial uses, surface waters
- The Santa Clara Valley Basin section of Table 2-9

10.2.2 Location-Specific Applicable or Relevant and Appropriate Requirements

Location-specific ARARs include the substantive provisions of the following:

- Section 403 of the Rivers and Harbors Act Title (33 USC Section 401-413, Title 33 CFR Part 322)
- Section 1456(c) of the Coastal Zone Management Act (16 USC Section 1451-1464, Title 15 CFR Part 930)
- Section 1536(a), (h)(1)(B) of the Federal Endangered Species Act (Title 16 USC Sections 1531-1543)
- Section 703 of the Migratory Bird Treaty Act (Title 16 USC Sections 703–712)
- Section 404 of the Clean Water Act Title (Title 33 USC Section 1344, Title 40 CFR Section 230.10)
- Title 40 of the *Code of Federal Regulations* Section 6.302(a), which codifies Executive Order 11990
- *California Fish and Game Code* Section 5650
- California Endangered Species Act, *California Fish and Game Code* Section 2080

All active alternatives comply with location-specific applicable or relevant and appropriate requirements. The coastal zone would not be permanently altered. For the alternatives that include excavation, sediments would be excavated in a manner that would minimize the anticipated short-term and temporary effects.

There are additional considerations applied to the construction of the cap in Alternatives 4A and 4B. Design of the cap and construction in the channel would take into account substantive requirements of the Rivers and Harbors Act, the Coastal Zone Management Act, the federal Endangered Species Act, the Migratory Bird Treaty Act, the California Endangered Species Act, and the *California Fish and Game Code*. The area would be capped in accordance with Section 404 of the Clean Water Act and implementing regulations, as well as the substantive requirements of Section 5650(a) of the *California Fish and Game Code*.

10.2.3 Action-Specific Applicable or Relevant and Appropriate Requirements

Action-specific ARARs include the substantive provisions of the following:

- Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1) 66261.100, 66262.34, 66268.1(f), 66268.7, 66262.20-23,66262.30-66262.33 (Resource Conservation and Recovery Act Title 42 USC, Chapter 82, Sections 6901-6991[i])

- Title 49 CFR Sections 171.2(f), 171.2(g), 172.300, 172.301,172.302, 172.303172.304, 172.312, 172.400, 172.504 (Regulations under the Federal Hazardous Materials Transportation Law, Title 49 USC Sections 5101-5127)

- BAAQMD Regulations 6, 6-301, 6-302, and 6-305 and Regulation 8, Rule 40 (Clean Air Act, Title 42 USC Section 7401 et seq.)

- Title 40 CFR Part 122 Subpart C (Regulations under Clean Water Act, Title 33 USC Section 1344)

- Title 40 CFR Section 761.61, 761.65(c)(4) and (c)(9), 761.79(b)(1) (Regulations under the Toxic Substances Control Act, Title 15 USC Chapter 53 Sections 2601-2692)

- Title 22 of the *California Code of Regulations* Section 66261.24(a)(2)

- Title 27 of the *California Code of Regulations* Sections 20210, 20220 and 20230

- California Stormwater Regulations, State Resources Water Control Board Order No. 99-08-DWQ

- *California Civil Code* Section 1471

- *California Health and Safety Code* Section 25202.5

All active alternatives comply with these action-specific applicable or relevant and appropriate requirements. During excavation in Alternatives 2, 3A, 3B, and 4B, best management practices (such as silt fences and erosion blankets) would be used to minimize contact between pollutants released by construction and stormwater and to minimize that amount of eroded soil that moves off site, in accordance with State Water Resources Control Board Order 99-08. Appropriate measures also would be used in accordance with Bay Area Air Quality Management District Regulation 6-301 to control dust during excavation.

Any excavated sediment will be characterized to evaluate whether the contaminated medium should be managed as a hazardous waste pursuant to *California Code of Regulations* Title 22 Section 66261.24 and Title 23 Section 2521 or as a designated waste as defined in Title 27 of the *California Code of Regulations* Section 20210. Sediment could be characterized either before or after it is excavated. An appropriate off-site disposal facility will be selected based on the results of the analysis. If the waste is identified as hazardous, the substantive requirements of Title 22 of the *California Code of Regulations* Sections 66262.30, 66262.31, and 66262.32 will apply for packaging, labeling, and marking the waste in accordance with the U.S. Department of Transportation regulations. Based on sampling during the data gaps investigation, some sediments and soil will be classified as California-hazardous, but not Resource Conservation and Recovery Act-hazardous.

As part of dewatering prior to excavation, the substantive requirements of a National Pollutant Discharge Elimination System permit would be required for the new discharge point (Title 40 of the *Code of Federal Regulations* 122 Subpart C). Best management practices would also be used to minimize contact between stormwater and construction pollutants in accordance with State Water Resources Control Board Order 99-08 and with Bay Area Air Quality Management District Regulation 6-301 to control dust during excavation.

For Alternatives 4A and 4B, which include institutional controls, compliance with *California Civil Code* Section 1471 and *California Health and Safety Code* Section 25202.5 would be required.

10.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

Alternatives 2, 3A, and 3B would all provide the same level of permanence because the contaminants would be removed, thereby permanently eliminating risks associated with contaminated soil and sediment to both human health and ecological receptors. Alternatives 3A and 3B would further improve long-term effectiveness by destroying or immobilizing some of the contaminants by applying a treatment technology. Alternative 4A provides long-term effectiveness by isolating the contaminants, but the integrity of the cap must be maintained indefinitely. Alternative 4B provides a greater level of permanence than does Alternative 4A because most of the contaminants would be removed. The level of permanence is lower for Alternative 4B than for Alternatives 2 and 3 because the integrity of the cap on the berm area must be maintained. Therefore, Alternative 4A is the least favorable and Alternatives 2, 3A, and 3B are the most favorable in providing long-term effectiveness and permanence.

10.4 SHORT-TERM EFFECTIVENESS

Each active alternative would be effective in the short term at reducing the level of contaminants in the Northern Channel and related areas, with minimal negative effects to workers or the community. Alternative 3A would take the longest to implement, and the risk to workers might be greater because of additional sediment handling during treatment. Alternatives 2, 3A and 3B, and 4A and 4B are readily implementable and all are acceptable. Alternative 2 would likely be implemented in the shortest time period with the least risk of impact during implementation and is, therefore, considered most favorable.

10.5 REDUCTION IN TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT

Alternatives 2, 3A, 3B, and 4B would remove contaminated sediment from the Northern Channel and related areas and, therefore, would reduce the volume at the site and the mobility of the contaminants by eliminating the potential for contaminants to leave the site. Alternative 3A would also reduce the toxicity of the organic and metal contaminants prior to off-site disposal. The level of reduction of toxicity and volume of organic chemicals would likely achieve the minimal reduction needed for disposal at a Class II landfill. Alternative 3B, stabilization, would not reduce the volume or toxicity of organic chemicals but would reduce the toxicity of metal contaminants prior to off-site disposal. This alternative would also reduce the mobility of all contaminants prior to off-site disposal. Alternative 4A would not reduce either the toxicity or the volume of contaminants but reduces only the mobility of the contaminants and the exposure of contaminants to receptors. Therefore, all the alternatives are acceptable, but Alternative 3A is regarded as the most favorable.

10.6 IMPLEMENTABILITY

All the remedial action alternatives provide engineering challenges but can be readily implemented. The areas to be excavated are the same for Alternatives 2, 3A, and 3B. Alternatives 2, 3A, 3B, and 4B would increase the capacity of the Northern Channel. In addition, operation and maintenance for these alternatives are much easier and economical than for Alternative 4A. Implementation of Alternative 4A would slightly decrease the capacity of the Northern Channel. Alternatives 2, 3A, 3B, and 4B are favored over Alternative 4A in terms of operation and maintenance and capacity of the channel. With regard to engineering and execution, Alternative 2, excavation and off-site disposal, would be the easiest to implement because it requires no treatment. Alternatives 3A and 3B, bioremediation or stabilization, would not be equipment intensive and would not present any major engineering obstacles. However, both require containing and treating the sediments onsite without disruptions to the habitat. In addition, bioremediation is not a proven technology for treating the polychlorinated biphenyls and pesticides in soil and sediments that are unique to Moffett. The concrete capping alternative (4A) would be equipment intensive and may present more engineering difficulties than would bioremediation. Overall, Alternative 2 is the most favorable regarding implementability and Alternative 4A is least favorable.

10.7 COSTS

The estimated cost of Alternative 2 is $6,761,070. Most costs are related to excavation and disposal of sediment and soil. The estimated cost of Alternative 3A is $6,552,000 and of Alternative 3B is $6,395,000. These costs mainly involve sediment excavation, stabilization, and biological treatment or disposal. The estimated cost of Alternatives 4A is $9,325,000 and of Alternative 4B is $6,328,000. In addition to excavation, disposal, and capping costs, Alternatives 4A and 4B also include cap maintenance, monitoring of institutional controls, and five-year reviews. Alternative 4B is the least costly of the alternatives that meet the established criteria. However, the difference in estimated cost among Alternatives 2, 3A, 3B, and 4B is negligible. Alternative 4A is the most expensive alternative. Alternative 4B is regarded as the most cost-favorable alternative and Alternative 4A is the least favorable.

10.8 STATE AND SUPPORT AGENCY ACCEPTANCE

U.S. Environmental Protection Agency and the State of California, through the San Francisco Bay Regional Water Quality Control Board, concur with the selection of Alternative 2 as the remedy for Site 27 as presented in the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

10.9 COMMUNITY ACCEPTANCE

A public review and comment period for the Site 27 Proposed Plan was held from May 4, 2004, to June 4, 2004 (Navy 2004), with a public meeting held on May 20, 2004. Representatives from the Navy, U.S. Environmental Protection Agency, and San Francisco Bay Regional Water Quality Control Board answered questions at this meeting, and supplied the rationale for proposing the selected remedy for the Northern Channel and related areas. Overall, the Site 27 Proposed Plan was accepted by the public. Specific public comments and Navy responses to those comments are presented in the Responsiveness Summary, which is provided in Appendix B to this Record of Decision.

11.0 PRINCIPAL THREAT WASTE

Contamination at Site 27 is not considered a principal threat waste based on "A Guide To Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents" (U.S. Environmental Protection Agency 1999). For example, there are no drummed wastes, free product, high concentrations of mobile chemicals, or highly toxic source materials. Sediment at Site 27 contains non-mobile contaminants at low concentrations that do not present an unacceptable excess cancer risk. These contaminants are considered a low-level threat waste. According to the U.S. Environmental Protection Agency guidance, these materials generally are not a principal threat waste; therefore, a discussion of principal threat waste was not deemed applicable to this Record of Decision.

12.0 SELECTED REMEDY

This section discusses the rationale for selecting the remedy at Site 27, describes the selected remedy, summarizes the anticipated costs associated with the selected remedy, and presents the expected outcomes of the remedy selected for Site 27.

12.1 RATIONALE FOR SELECTION OF REMEDY

Based on a comparison between the different alternatives, the Navy has selected Alternative 2 as the preferred alternative because the remedy:

- Meets the overall remedial action objective to limit exposure of human and ecological receptors to contaminated soil and sediments in the Northern Channel and related areas
- Meets applicable or relevant and appropriate requirements
- Is permanent and effective without the need for long-term operations, maintenance, or monitoring
- Provides a proven remediation strategy when compared to other alternatives
- Reduces risk within a shorter timeframe than the other alternatives
- Is more easily implemented than the other alternatives
- Costs less than Alternative 4A and similar in cost to the other alternatives
- Is consistent with projected land uses

Table 6 summarized the comparison of each remedial alternative. Based on the information available at this time, the Navy, U.S. Environmental Protection Agency, and the San Francisco Bay Regional Water Quality Control Board believe that Alternative 2 would be protective of human health and the environment and would provide permanent solutions to the maximum extent practicable.

12.2 DESCRIPTION OF SELECTED REMEDY

Alternative 2 consists of sediment and soil excavation and off-site landfill disposal. The sediment or soil would not be treated before disposal. The major components of the selected remedy include:

- Excavating sediment where concentrations of chemicals of ecological concern exceed cleanup goals considered safe for birds such as the great blue heron and the black-necked stilt, which are considered the most sensitive ecological receptors likely to be present in the Northern Channel and related areas given site uses. Excavating soil where concentrations exceed the residential preliminary remediation goals (U.S. Environmental Protection Agency 2004).

- Transporting excavated sediments and soil off site to an appropriate disposal facility.

- Collecting confirmation samples in the excavated areas to ensure that sediment and soil exceeding the cleanup goals have been removed in accordance with the guidelines established in this Record of Decision.

- Restoring the site by (1) backfilling the excavated areas of the berms with clean soil (free from contaminants), (2) backfilling selected areas of the Northern Channel and associated ditches (as needed) to maintain the hydrologic conditions, and (3) revegetating berms with plants native to California.

The excavation will extend according to the following limits with the minimum excavation depths shown on Figure 8).

- Contaminated sediments from the entire length of the Northern Channel.

- Contaminated sediments from the entire length of the North Patrol Road Ditch.

- Contaminated sediments from approximately a 1,700-foot length of the Marriage Road Ditch.

- Contaminated sediments from the debris pile.

- Contaminated soil from (1) the western end of the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191, and (2) the Lockheed berm near the eastern end of the Northern Channel.

Based on the analytical data from samples collected during the data gaps investigation, about 44,100 cubic yards of sediment or soil will be disposed of in a Class II (nonhazardous waste) landfill and about 21,500 cubic yards will be disposed of in a Class I (hazardous waste) landfill. Excavation and subsequent disposal or treatment is most cost-effectively accomplished if the Northern Channel and the ditches are dewatered. Dewatering first requires diversion of all flow from the Northern Channel. It is also recommended that the channel be dewatered in stages to maintain habitat for the western pond turtle. Once a section has been dewatered, the sediment will be sampled and characterized in accordance with federal and state requirements and disposed of appropriately.

After the channel is excavated, collection of confirmation samples from the excavation and visual identification of the clay layer in the excavation (where appropriate) will be used to confirm that the response action has been completed in compliance with this Record of Decision. Details of confirmation sampling will be provided in the remedial design.

The site will be restored when confirmation sampling indicates the remedial goals have been achieved. Clean soil brought on site as backfill will be similar to existing soil and will be transported in trucks in accordance with a transportation plan to be developed as part of the cleanup design. The berms will be regraded as needed.

Efforts will be made to obtain backfill soil that is generally free from noxious weeds. Wetland plant species will then be reintroduced, where necessary, based on a revegetation plan prepared as part of the cleanup design. Only the excavated berms will be revegetated. A trained wetlands biologist would be present to monitor all on-site construction.

12.3 SUMMARY OF COSTS FOR SELECTED REMEDY

Table 7 summarizes the estimated costs for the selected remedy. The information in Table 7 is based on the best available information regarding the anticipated scope of the remedial alternative. This engineering cost is an order-of-magnitude estimate that is expected to be within plus 50 to minus 30 percent of the actual project cost.

12.4 EXPECTED OUTCOMES OF SELECTED REMEDY

This alternative is expected to result in achieving the remedial action objective by permanently eliminating risks for both human and ecological receptors associated with contaminated sediment and soil at Site 27.

TABLE 7: COST ESTIMATE OF THE SELECTED REMEDY[a]
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Description: Alternative 2: Excavation and Off-Site Disposal	Total Labor (including overhead and profit)	Total Equipment (including profit)	Total Material (including profit)	Total (including overhead and profit)
Distributive Costs	$675,304	$0	$170,500	$845,804
Temporary Facilities	$0	$0	$37,973	$37,973
Construction Oversight	$121,520	$0	$31,000	$152,520
Mobilization (< 50 miles)	$1,282	$2,586	$0	$3,868
Site Preparation	$87,180	$10,166	$116,399	$213,745
Water Diversion	$135,381	$54,012	$323,294	$512,687
Trench Dewatering (after diversion)	$63,294	$11,962	$0	$75,256
Sediment Sampling and Analysis for waste characterization (1 sample per 2,000 cubic yards ≥ 33 samples + 4 quality control samples)	$5,180	$0	$22,385	$27,565
Excavation	$134,743	$102,330	$0	$237,073
Hauling	$0	$0	$1,583,066	$1,583,066
Disposal	$0	$0	$1,660,325	$1,660,325
Confirmation sampling of channel and ditch bottoms	$14,000	$0	$45,100	$59,100
Site Restoration	$71,164	$45,443	$507,213	$623,820
Demobilization (< 50 miles)	$1,282	$2,586	$0	$3,868
			Construction Subtotal =	**$6,036,670**
Design Cost			**Design Cost Subtotal =**	**$724,400**
Assume 12 percent of construction cost (including remedial design, design basis report, health and safety plan, contingency plan, quality assurance and quality control plan, quality assurance project plan, and cost estimate)	$724,400			$724,400
			TOTAL PROJECT COST =	**$6,761,070**

Notes:

a More detail on the cost estimate can found in Appendix E of the final feasibility study for the Northern Channel (Tetra Tech EM Inc. 2003).

Source:

Tetra Tech EM Inc. 2003. "Northern Channel Feasibility Study(Site 27), Former Naval Air Station, Moffett Field, Santa Clara County, California." November.

13.0 DOCUMENTATION OF SIGNIFICANT CHANGES

A public review and comment period for the Site 27 Proposed Plan was held from May 4, 2004, to June 4, 2004 (Navy 2004), with a public meeting held on May 20, 2004. The Navy reviewed all written and oral public comments submitted during the public comment period on the proposed plan. Based on this review, no significant changes were made to the preferred alternative or proposed plan for Site 27. Specific public comments and Navy responses to those comments are presented in the Responsiveness Summary, which is provided in Appendix B to this Record of Decision.

14.0 STATUTORY DETERMINATIONS

The following statutory determinations are provided to describe how the selected remedy satisfies the statutory requirements of the Comprehensive Environmental Response, Compensation, and Liability Act, Section 121 (as required by the National Oil and Hazardous Substances Pollution Contingency Plan, Section 300.430[f][5][ii]) and explains whether there is a need for the five-year review requirement for the selected remedy.

14.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The overall remedial action objective is to limit the exposure of ecological receptors to chemicals of concern in sediment and soil in the Northern Channel, associated ditches, adjacent berms, and the debris pile near Building 191. Limiting the exposure in the selected remedy will involve removal and off-site disposal of sediment and soil that contain contaminants at levels that exceed cleanup goals established to protect ecological receptors. These cleanup goals are based on the protection of birds; however, they are also protective of human health because they are below protective human health applicable or relevant and appropriate requirements. No short-term threats are associated with the selected remedy that cannot be easily controlled. No cross-media impacts are expected from the remedy.

14.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Several chemical-, location-, and action-specific applicable or relevant and appropriate requirements apply to this remedial action involving excavation and off-site disposal of contaminated sediment and soil from the Northern Channel and related areas. The selected remedy complies with all of these chemical-, location-, and action-specific applicable or relevant and appropriate requirements. The primary controlling applicable or relevant and appropriate requirements for the remedial action relate to excavating contaminated sediments and soil in accordance with the Toxic Substances Control Act, the Resource Conservation and Recovery Act, and other requirements. Excavated sediment will be properly characterized and will be disposed of in accordance with the Resource Conservation and Recovery Act.

Appendix C provides a complete evaluation of applicable or relevant and appropriate requirements considered for this remedial action, and Section 10.2 and Tables 3, 4, and 5 summarized the requirements determined to be final applicable or relevant and appropriate requirements.

14.3 COST EFFECTIVENESS

The selected remedy meets the statutory requirement that all Superfund remedies be cost-effective. A cost-effective remedy is one whose "costs are proportional to its overall effectiveness" (National Oil and Hazardous Substances Pollution Contingency Plan Section 300.430[f][1][ii][D]). The overall effectiveness is determined by evaluating the following

balancing criteria: long-term effectiveness and permanence; short-term effectiveness; and reduction in toxicity, mobility, and volume through treatment. The overall effectiveness is then compared to cost to determine whether the remedy is cost effective.

The first criteria, long-term effectiveness and permanence, focuses on whether a given alternative can maintain protection of human health and the environment over time. The selected remedy provides long-term effectiveness and permanence because the chemicals of ecological concern will be removed, thereby permanently eliminating risks associated with contaminated soil and sediment to both human health and ecological receptors. The selected alternative involves removing contaminated sediments to protective levels and replacing them with clean sediment or soil. The selected remedy also includes measures to limit the presence of sensitive ecological receptors such as the western pond turtle at the site during the remedial action.

The second criteria, short-term effectiveness, considers whether the length of time needed to implement a given alternative will potentially pose risks to workers, residents, and the environment during implementation. The selected alternative, because of the relatively short time period needed to complete the project, would be effective in minimizing negative effects on workers or the community. Although ecological receptors will be disrupted in the short-term because of the remedial action, this temporary disruption is unavoidable for any of the active remedial alternatives. Further, because contaminated sediments removed from the site will be handled minimally and stored for a shorter period relative to other alternatives, Alternative 2 provides the most favorable short-term effectiveness.

The third criteria, reduction of toxicity, mobility or volume through treatment, evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, the contaminant's ability to move in the environment, and the amount of contamination present. The selected alternative, removal of contaminated sediments, reduces the volume at the site and the mobility of the contaminants over time by eliminating the potential for contaminant transport. Although there may be a temporary increase in mobility of contaminated sediments during the remedial action, this will lessen with time. Alternative 2 does not specifically reduce the toxicity of the sediment through treatment; however, the remedial action does result in a reduction in the overall toxicity of the sediment and soil at the site particularly since the contaminated areas will be backfilled with clean soil.

As discussed in Section 10.7, the estimated costs for the selected remedy (Alternative 2) are similar to the estimated costs for most of the other alternatives except Alternative 4A, which has a higher cost. However, Alternative 2 is a viable alternative that is cost effective when considering the balancing criteria components that comprise overall effectiveness: (1) long-term effectiveness and permanence; (2) short-term effectiveness; (3) reduction in toxicity, mobility, and volume through treatment; and (4) implementability.

14.4 USING PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The Navy, U.S. Environmental Protection Agency, and the San Francisco Bay Regional Water Quality Control Board have determined that the selected remedy (Alternative 2) represents the maximum extent to which permanent solutions and alternative treatment technologies can be used in a cost effective manner. Alternative 2 meets the overall remedial action objective—to limit exposure of ecological receptors to contaminated soil and sediments in the Northern Channel and related areas. By accomplishing this goal, the selected remedy is protective of human health and the environment and complies with applicable or relevant and appropriate requirements. The selected remedy also provides the best balance among the criteria of maximizing short-term effectiveness, long-term effectiveness and permanence, implementability, and cost. The selected remedy also provides a proven remediation strategy and is consistent with projected land uses. More detail on the rationale for selecting Alternative 2 can be found in Sections 10.0 and 12.1.

14.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

Because on-site treatment of the chemicals of ecological concern was not found practicable, this type of remedy does not satisfy the statutory preference for treatment as the principal element of the remedy. Uncertainty about the effectiveness of the proposed biotreatment techniques for the specific organic contaminants present at the site and the essentially "untreatable" nature of the metals preclude a remedy that could treat contaminants effectively. Therefore, it is concluded that reasonably available treatment technologies would not adequately reduce the toxicity level of the chemicals of ecological concern in sediment.

14.6 FIVE-YEAR REVIEW REQUIREMENTS

Five-year reviews are not required because in the selected remedy, chemicals will be removed to protective levels.

15.0 RESPONSIVENESS SUMMARY

The responsiveness summary contains the Navy's responses to public comments on the proposed plan received during the public comment period from May 4 to June 4, 2004, and during the public meeting held on May 20, 2004. These responses are included as Appendix B to this Record of Decision.

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APPENDIX A
INDEX OF ADMINISTRATIVE RECORD FOR SITE 27, FORMER NAVAL AIR STATION MOFFETT FIELD

MOFFETT FIELD

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CORRESP		A. MUCKERMAN	CONFIDENTIAL}	REPOSITORY			
NONE		CA. E.P.A - SAN FRANCISCO L. SUER					
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DS.0226.17264 PLAN PLAN N62474-94-D-7609 00300	**01-21-2002** 00226	INC. J. KNIGHT J. KNIGHT NAVFAC - SOUTHWEST DIVISION	INVESTIGATION FIELD WORK PLAN -INCLUDES SWDIV TRANSMITTAL LETTER FROM M. AVERY WHICH CONTAINS SOME CONFIDENTIAL ADDRESSES	CONFIDENTIAL INFO REPOSITORY	PAH PCB SVOC TOC		NIGEL 181-03-0184 181-03-0184 1 OF 13
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N00296 / 000798 NONE MISC NONE	11-10-2003 **07-30-2002** NONE	U.S. EPA - SAN FRANCISCO L. TAN NAVFAC - SOUTHWEST DIVISION	NO FURTHER COMMENTS ON THE DRAFT FINAL NORTHERN CHANNEL FEASIBILITY STUDY	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
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N00296 / 000797 NONE MISC MISC	11-10-2003 **06-18-2003** NONE NONE	CRWQCB - OAKLAND A. A. CONSTANTINESC	CONCURRENCE ON THE DRAFT FINAL NORTHERN CHANNEL FEASIBILITY STUDY'S RECOMMENDATION TO EXCAVATE THE CONTAMINATED SEDIMENT	ADMIN RECORD INFO REPOSITORY		027	SOUTHWEST DIVISION
N00296 / 000796 NONE MISC MISC NONE	11-10-2003 **06-30-2003** NONE NONE	ARC - MOFFETT FIELD D. CHUCK D. CHUCK NAVFAC - SOUTHWEST DIVISION	COMMENTS ON THE DRAFT FINAL NORTHERN CHANNEL FEASIBILITY STUDY. ***COMMENTS: PER RPM, DOCUMENT RELATES TO SITE 27.***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 000676 SWDIV SER 06CH.SG/1070 MISC NONE	08-08-2003 **07-22-2003** NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA	RESPONSE TO COMMENTS ON THE DRAFT FINAL FEASIBILITY STUDY FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS PCB	027	FRC - LAGUNA NIGEL 181-03-0184 13 OF 13

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Approx. # Pages	**EPA Cat. #**	**Recipient**	**Subject/Comment**	**Classification**	**Keywords**	**Sites**	**CD**
N00296 / 000672 SWDIV SER 06CH.SG/1120 MISC NONE	08-08-2003 **07-31-2003** NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA LOCKHEED MARTIN	TRANSMITTAL LETTER FOR THE DRAFT FINAL NORTHERN CHANNEL FEASIBILITY STUDY DATED 15 MAY 2003	ADMIN RECORD INFO REPOSITORY		027	FRC - LAGUNA NIGEL 181-03-0184 13 OF 13
N00296 / 000695 SWDIV SER 06CH.SG/1159 06CH.SG/1159 LTR LTR NONE 00004	09-24-2003 **08-07-2003** NONE NONE	NAVFAC - SOUTHWEST DIVISION K. FORMAN LOCKHEED MARTIN SPACE SYSTEMS	LETTER AGREEING TO PROVIDE THE NAVY WITH COMMENTS, CONCURRENCE, OR REQUEST FOR ADDITIONAL TIME TO REVIEW THE DRAFT FINAL FEASIBILITY STUDY FOR THE NORTHERN CHANNEL AND REQUEST FOR ACCESS TO COMPLETE THE DATA GAPS SAMPLING	ADMIN RECORD INFO REPOSITORY		027	SOUTHWEST DIVISION
N00296 / 000830 NONE LTR LTR NONE	01-06-2004 **08-20-2003** NONE NONE	LOCKHEED MARTIN A. LUND A. LUND NAVFAC - SOUTHWEST DIVISION	LETTER IN RESPONSE TO NAVY 07 AUGUST 2003 LETTER REQUESTING ADDITIONAL TIME TO REVIEW THE FINAL NORTHERN CHANNEL FEASIBILITY STUDY AND ACCESS TO PROPERTY	ADMIN RECORD INFO REPOSITORY		027	SOUTHWEST DIVISION
N00296 / 000831 NONE MISC NONE	01-06-2004 **09-22-2003** NONE	LOCKHEED MARTIN A. LUND NAVFAC -	COMMENTS TO THE FINAL NORTHERN CHANNEL FEASIBILITY STUDY	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003295 SWDIV SER.06CH.SG/1453 SER.06CH.SG/1453 LTR NONE	03-01-2004 **11-05-2003** NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA RWQCB - SAN FRANCISCO BAY	LETTER REGARDING THE FEDERAL FACILITY AGREEMENT (FFA) SCHEDULE, ATTACHMENT 3 HAS BEEN MODIFIED AND THE PARTIES HAVE VERBALLY AGREED TO THIS MODIFICATION OF THE FFA [INCLUDES MODIFIED ATTACHMENT 3 AND DETAILED DRAFT PROJECT	ADMIN RECORD CONFIDENTIAL INFO REPOSITORY	AGREEMENT FFA	027	SOUTHWEST DIVISION
N00296 / 000806 DS.A048.10122 & SWDIV SER SWDIV SER 06CH.SG/1452 RPT	01-06-2004 **11-06-2003** DO 0048	TETRA TECH EM INC. J. KNIGHT J. KNIGHT NAVFAC - SOUTHWEST (N68711-00-D-0005) DIVISION	FINAL NORTHERN CHANNEL FEASIBILITY STUDY - INCLUDES (SWDIV TRANSMITTAL LETTER BY A. ESPINOZA), [PORTION OF MAILING LIST IS CONFIDENTIAL]	ADMIN RECORD CONFIDENTIAL INFO REPOSITORY	DDD DDE DDT PVC	027	SOUTHWEST DIVISION

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Approx. # Pages	**EPA Cat. #**	**Recipient**	**Subject/Comment**	**Classification**	**Keywords**	**Sites**	**CD**
N00296 / 003432 SWDIV SER 06CH.SG/1579 CORRESP NONE	05-06-2005 **12-17-2003** NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT PROPOSED PLAN. ***COMMENTS: SEE AR #815 - DRAFT PROPOSED PLAN.***	ADMIN RECORD INFO REPOSITORY		027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003433 SWDIV SER 06CH.SG/1583 06CH.SG/1583 CORRESP NONE	05-06-2005 **12-17-2003** NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA NAVFAC - SOUTHWEST DIVISION	REMEDIAL ACTION/REMEDIAL DESIGN (RA/RD) SCHEDULE {PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD CONFIDENTIAL INFO REPOSITORY	RA RD	027	SOUTHWEST DIVISION - BLDG. 1 1
N00296 / 003429 04-1413 CORRESP N68711-98-D-5713	05-02-2005 **01-21-2004** 00069	CITY OF SUNNYVALE M. CHAN NAVFAC - SOUTHWEST DIVISION	RESPONSES TO COMMENTS ON THE DRAFT PROPOSED PLAN	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003293 NONE LTR LTR NONE 00002	03-01-2004 **01-23-2004** NONE NONE	LOCKHEED MARTIN SPACE SYSTEMS A. LUND NAVFAC - SOUTHWEST DIVISION	COMMENTS REGARDING NORTHERN CHANNEL IN REFERENCE TO THE DEPARTMENT OF THE NAVY DRAFT PROPOSED PLAN AND REMEDIAL DESIGN AND REMEDIAL ACTION SCHEDULE 17 DECEMBER 2004 LOCKHEED MARTIN RESPONSE TO FINAL DRAFT FEASIBILITY STUDY (FS)	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 000878 NONE MISC NONE	03-17-2004 **01-30-2004** NONE	U.S. EPA - SAN FRANCISCO L. TAN NAVFAC - SOUTHWEST	RESPONSE TO COMMENTS ON THE DRAFT PROPOSED PLAN	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003292 NONE LTR LTR NONE	02-27-2004 **01-30-2004** NONE NONE	U.S. EPA - REGION IX L. TAN L. TAN NAVFAC - SOUTHWEST DIVISION	COMMENTS REGARDING DRAFT PROPOSED PLAN DATED 17 DECEMBER 2003	ADMIN RECORD INFO REPOSITORY REPOSITORY	CADIUM CHEMICALS CHLORDANE	027	SOUTHWEST DIVISION

UIC No. / Rec. Doc. Control No. Record Type Contr./Guid. No.	Prc. Date Record Date CTO No.	Author Affil. Author Recipient Affil.					Location FRC Access. No. FRC/SWDIV Box FRC Warehouse Loc.
Approx. # Pages	**EPA Cat. #**	**Recipient**	**Subject/Comment**	**Classification**	**Keywords**	**Sites**	**CD**
N00296 / 003307 DS.A048.12971 & SWDIV SER SWDIV SER 06CH.SG/0232 RPT N68711-00-D-0005	05-04-2004 **02-26-2004** DO 0048	TETRA TECH EM INC. J. KNIGHT J. KNIGHT NAVFAC - SOUTHWEST DIVISION	TECHNICAL MEMORANDUM INVESTIGATION OF THE MOFFETT CHANNEL [INCLUDES SWDIV TRANSMITTAL LETTER BY A. ESPINOZA]{PORTION OF MAILING LIST IS CONFIDENTIAL}	ADMIN RECORD CONFIDENTIAL INFO REPOSITORY	TECH MEMO	027	SOUTHWEST DIVISION - BLDG. 1 1
N00296 / 003319 SWDIV SER. 06CH.SG/0334 06CH.SG/0334 LTR LTR NONE 00002	05-26-2004 **03-25-2004** NONE NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA US FISH AND WILDLIFE SERVICE M. LITTLEFIELD	RE-TRANSMITTAL OF THE DRAFT FINAL PROPOSED PLAN AND THE RESPONSE TO COMMENTS DUE TO INTERRUPTION OF THE ELECTRONIC MAIL SERVICE. ***COMMENTS: SEE AR #3304 - DRAFT FINAL PROPOSED PLAN FACT SHEET AND AR #878, AR #3293 AND AR #3429 FOR RESPONSES TO COMMENTS.***	ADMIN RECORD INFO REPOSITORY	COMMENTS PLAN	027	SOUTHWEST DIVISION
N00296 / 003303 FILE NO. 2189.8009 LTR LTR	05-04-2004 **04-01-2004** NONE NONE	CRWQCB - SAN FRANCISCO CONSTANTINESC	CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD (CRWQCB) CONCURRENCE IN REGARDS WITH NORTHERN CHANNEL DRAFT PROPOSED PLAN AND NAVY'S RTC NAVFAC - SOUTHWEST DIVISION	ADMIN RECORD INFO REPOSITORY	PLAN	027	SOUTHWEST DIVISION
N00296 / 003304 NONE MISC NONE	05-04-2004 **04-01-2004** NONE	KATZ AND ASSOCIATES R. ROHATGEE TETRA TECH FW INC.	FACT SHEET: PROPOSED PLAN FOR THE NORTHERN CHANNEL - U.S. NAVY ANNOUNCES PROPOSED PLAN	ADMIN RECORD INFO REPOSITORY	PLAN	027	SOUTHWEST DIVISION
N00296 / 003314 SWDIV SER. 06CH.SG/0413 06CH.SG/0413 &414& 415 LTR	05-13-2004 **04-15-2004** NONE NONE	NAVFAC - SOUTHWEST DIVISION A. ESPINOZA VARIOUS	NOTIFICATION OF PROPERTY CORNER SURVEY TO ESTABLISH THE LOCATION OF BOUNDARIES ALONG THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	SURVEY	027	SOUTHWEST DIVISION
N00296 / 003328 04-2245 MISC MISC N68711-98-D-5713 00009	06-30-2004 **04-20-2004** 00086 00086	TETRA TECH FW INC. GENERAL PUBLIC	PUBLIC COMMENT PERIOD AND PROOF OF PUBLICATION FOR THE PROPOSED PLAN TO CLEAN UP THE NORTHERN CHANNEL - PUBLISHED IN THE SAN JOSE MERCURY NEWS. ***COMMENTS: DOCUMENT ORIGINATED FROM KATZ AND ASSOCIATES.***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION

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N00296 / 003360 04-2245 MISC MISC N68711-98-D-5713 00005	10-26-2004 **04-25-2004** 00086 00086	TETRA TECH FW INC. GENERAL PUBLIC	PUBLIC COMMENT PERIOD AND PROOF OF PUBLICATION FOR THE PROPOSED PLAN TO CLEAN UP THE NORTHERN CHANNEL - PUBLISHED IN THE SAN JOSE MERCURY NEWS. ***COMMENTS: DOCUMENT ORIGINATED FROM KATZ AND ASSOCIATES***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003361 04-2245 MISC MISC N68711-98-D-5713 00004	10-26-2004 **05-12-2004** 00086 00086	TETRA TECH FW INC. GENERAL PUBLIC	PUBLIC COMMENT PERIOD FOR THE PROPOSED PLAN TO CLEAN UP THE NORTHERN CHANNEL - PUBLISHED IN THE LOS ALTOS TOWN CRIER. ***COMMENTS: DOCUMENT ORIGINATED FROM KATZ AND ASSOCIATES.***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003362 04-2245 MISC MISC N68711-98-D-5713 00004	10-26-2004 **05-12-2004** 00086 00086	TETRA TECH FW INC. GENERAL PUBLIC	PUBLIC COMMENT PERIOD FOR THE PROPOSED PLAN TO CLEAN UP THE NORTHERN CHANNEL - PUBLISHED IN THE SUNNYVALE SUN. ***COMMENTS: DOCUMENT ORIGINATED FROM KATZ AND ASSOCIATES.***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003363 04/2245 MISC MISC N68711-98-D-5713 00004	10-26-2004 **05-14-2004** 00086 00086	TETRA TECH FW INC. GENERAL PUBLIC	PUBLIC COMMENT PERIOD FOR THE PROPOSED PLAN TO CLEAN UP THE NORTHERN CHANNEL - PUBLISHED IN THE MOUNTAIN VIEW VOICE	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION
N00296 / 003324 FWSD-RAC-04-214 MISC N68711-98-D-5713 (RAC III)	06-21-2004 **05-20-2004** 00069	TETRA TECH FW INC. NAVFAC - SOUTHWEST VARIOUS AGENCIES	TRANSCRIPT OF THE PUBLIC MEETING REGARDING NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS PUBMTG SOIL STORMWATER	027	SOUTHWEST DIVISION
N00296 / 003443 NONE CORRESP CORRESP NONE	05-10-2005 **05-05-2004** NONE	COMMUNITY MEMBER J. CARTER J. CARTER NAVFAC - SOUTHWEST DIVISION	COMMENTS ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL. ***COMMENTS: DOCUMENT UNDATED, DATE RECEIVED USED AS RECORD DATE.***	ADMIN RECORD	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1 1

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Approx. # Pages	**EPA Cat. #**	**Recipient**	**Subject/Comment**	**Classification**	**Keywords**	**Sites**	**CD**
N00296 / 003442 NONE CORRESP CORRESP NONE	05-10-2005 **05-11-2004** NONE	COMMUNITY MEMBER A. JOHN A. JOHN NAVFAC - SOUTHWEST DIVISION	COMMENT ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL. ***COMMENTS: DOCUMENT UNDATED, DATE RECEIVED USED AS RECORD DATE.***	ADMIN RECORD	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1 1
N00296 / 003441 NONE CORRESP CORRESP NONE	05-10-2005 **05-24-2004** NONE	COMMUNITY MEMBER M. PETRA M. PETRA NAVFAC - SOUTHWEST DIVISION	COMMENT ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL. ***COMMENTS: DOCUMENT IS UNDATED, FAX DATE USED AS RECORD DATE.***	ADMIN RECORD	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1 1
N00296 / 003437 NONE CORRESP NONE	05-09-2005 **06-01-2004** NONE	CITY OF MOUNTAIN VIEW K. WOODHOUSE NAVFAC - SOUTHWEST DIVISION A. ESPINOZA	COMMENTS ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003438 NONE CORRESP	05-10-2005 **06-04-2004** NONE	SANTA CLARA VALLEY WATER DIST. J. FIEDLER NAVFAC - SOUTHWEST DIVISION A. ESPINOZA	COMMENTS ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003439 NONE CORRESP	05-10-2005 **06-04-2004** NONE	L. LUCAS NAVFAC - SOUTHWEST DIVISION A. ESPINOZA	ELECTRONIC MAIL COMMENTS ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003440 NONE CORRESP CORRESP NONE 00001	05-10-2005 **05-10-2005** NONE NONE	CITIZEN COMMITTEE F. LARIVIERE F. LARIVIERE NAVFAC - SOUTHWEST DIVISION A. ESPINOZA	COMMENTS BY THE CITIZEN COMMITTEE TO COMPLETE THE REFUGE ON THE PROPOSED PLAN FOR THE NORTHERN CHANNEL. ***COMMENTS: DOCUMENT NOT DATED, PROCESS DATE USED AS RECORD DATE.***	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 1 1

UIC No. / Rec. Doc. Control No. Record Type Contr./Guid. No.	Prc. Date Record Date CTO No.	Author Affil. Author Recipient Affil.					Location FRC Access. No. FRC/SWDIV Box FRC Warehouse Loc.
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N00296 / 003347 TC.B023.10277 & SWDIV SER. SWDIV SER. 06CH.SG/0838 MISC MISC STAECRU	09-02-2004 **07-14-2004** 00023 00023	SULTECH NAVFAC - NAVFAC - SOUTHWEST DIVISION	DRAFT TECHNICAL MEMORANDUM - NORTHERN CHANNEL REVISED CALCULATION OF THE ALLOWABLE EXPOSURE LEVEL FOR TOTAL POLYCHLORINATED BIPHENYLS (PCB) [INCLUDES SWDIB TRANSMITTAL LETTER BY A. ESPINOZA]	ADMIN RECORD INFO REPOSITORY	PCB	027	SOUTHWEST DIVISION
N00296 / 003359 FWSD-RAC-04-277 PLAN N68711-98-D-5713	10-22-2004 **10-21-2004** 00069	TETRA TECH FW, INC. NAVFAC - (RAC III) SOUTHWEST DIVISION	RESPONSIVENESS SUMMARY FOR PROPOSED PLAN NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	HAZWASTE PCB PLAN	027	SOUTHWEST DIVISION
N00296 / 003378 NONE CORRESP NONE	12-02-2004 **11-16-2004** NONE	FWS - SACRAMENTO D. HARLOW NAVFAC - SOUTHWEST DIVISION	REVIEW AND COMMENT ON THE DRAFT RECORD OF DECISION (ROD)	ADMIN RECORD INFO REPOSITORY	COMMENTS ROD	027	SOUTHWEST DIVISION - BLDG. 129
N00296 / 003431 NONE CORRESP	05-06-2005 **12-13-2004** NONE	EOA, INC. D. EISENBERG NAVFAC - SOUTHWEST DIVISION	COMMENTS ON THE DRAFT RECORD OF DECISION (ROD) FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS ROD	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003419 NONE CORRESP CORRESP NONE 00001	04-04-2005 **01-10-2005** NONE NONE	NASA - AMES RESEARCH CENTER E. WATKINS U.S. FISH & WILDLIFE SERVICE	REQUEST FOR CONCURRENCE FOR DETERMINATIONS REGARDING THE WESTERN SNOWY PLOVER AND CALIFORNIA LEAST TERN (SEE AR #3358 FOR THE DRAFT RECORD OF DECISION (ROD)) J. BROWNING	ADMIN RECORD INFO REPOSITORY	ROD	027	SOUTHWEST DIVISION - BLDG. 1
N00296 / 003422 NONE CORRESP CORRESP NONE	04-06-2005 **01-10-2005** NONE NONE	AMES RESEARCH CENTER E. WATKINS E. WATKINS U.S. FISH & WILDLIFE	CONCURRENCE THAT THE REMEDIATION OF SITE 27 IS NOT LIKELY TO ADVERSELY AFFECT THE WESTERN SNOWY PLOVER DUE TO LACK OF HABITAT CONTITUENTS AND THE CALIFORNIA LEAST TERN AS AN OCASSIONAL FALL MIGRANT (W/O ENCLOSURE) (SEE AR #3358 – DRAFT J. BROWNING	ADMIN RECORD INFO REPOSITORY		027	SOUTHWEST DIVISION - BLDG. 1 1
N00296 / 003430 NONE CORRESP	05-06-2005 **01-12-2005** NONE	CRWQCB - SAN FRANCISCO A. CONSTANTINESC	COMMENTS ON THE DRAFT RECORD OF DECISION (ROD) FOR THE NORTHERN CHANNEL	ADMIN RECORD INFO REPOSITORY	COMMENTS ROD	027	SOUTHWEST DIVISION - BLDG. 1

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Approx. # Pages	**EPA Cat. #**	**Recipient**	**Subject/Comment**	**Classification**	**Keywords**	**Sites**	**CD**
N00296 / 003404 NONE COMMENTS NONE	02-17-2005 **01-24-2005** NONE	U.S. EPA - SAN FRANCISCO L. TAN BRAC - SAN DIEGO A. ESPINOZA	REVIEW AND COMMENT ON THE DRAFT RECORD OF DECISION (ROD)	ADMIN RECORD INFO REPOSITORY	COMMENTS	027	SOUTHWEST DIVISION - BLDG. 129
N00296 / 003401 FWSD-RAC-05-028 6 & SWDIV SER 6 & SWDIV SER BPMOW.DSG/0377 RPT N68711-98-D-5713 00015	02-16-2005 **02-09-2005** 00069	TETRA TECH FW INC. B. MAIDRAND B. MAIDRAND NAVFAC - SOUTHWEST DIVISION S. GROMKO	TECHNICAL MEMORANDUM FOR THE SOIL SAMPLES COLLECTED FROM THE NORTHERN CHANNEL BERM, REVISION 1[INCLUDES SWDIV TRANSMITTAL LETTER BY A. KLIMEK]{PORTION OF MAILING LIST IS CONFIDENTIAL, CD COPY ENCLOSED}. ***COMMENTS: SEE AR #3391 FOR THE TECHNICAL MEMORANDUM, REVISION	ADMIN RECORD CONFIDENTIAL INFO REPOSITORY		027	SOUTHWEST DIVISION - BLDG. 129 129
	04-01-2005		LETTER REGARDING THE FEDERAL FACILITY AGREEMENT (FFA) SCHEDULE, ATTACHMENT 3 HAS BEEN MODIFIED [INCLUDES MODIFIED ATTACHMENT 3 AND DETAILED DRAFT PROJECT SCHEDULE)	ADMIN RECORD CONFIDENTIAL	AGREEMENT FFA	027	SOUTHWEST DIVISION

APPENDIX B
PUBLIC MEETING TRANSCRIPT AND RESPONSIVENESS SUMMARY

NAVAL FACILITIES ENGINEERING COMMAND

SOUTHWEST DIVISION

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TRANSCRIPT OF THE PUBLIC MEETING

REGARDING SITE 27, NORTHERN CHANNEL

AT THE FORMER NAS MOFFETT FIELD

Mountain View, California

Thursday, May 20, 2004

Transcript of the public meeting held by the Naval Facilities Engineering Command, Southwest Division, at 500 Castro Street, City Council Chambers, Mountain View, California, from 7:30 to 9:00 p.m., Thursday, May 20, 2004, before Deirdre F. Cram, C.S.R. 9339.

THURSDAY, MAY 20, 2004 7:30 P.M.

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MR. WEISSENBORN: Good evening. I'm Rick Weissenborn, as you can see, not Andrea

Espinoza. Andrea had family medical emergency and could not come up tonight.

It's 7:30 on the 20th of May, and I would like to start the meeting regarding Site 27 at the former Naval Air Station Moffett Field. I'd like to go through a couple of logistical, administrative issues.

If you didn't pick up copies of the handouts, they're on the table over here. If you're interested in getting a regular mailing regarding information about what's going on at Site 27, as well as other sites at Moffett Field, please sign in, and we'll add you to our mailing list.

The business part of the meeting, the restrooms, in case you didn't notice, are out directly across the hall, Men's to the right and Women's to the left. The City of Mountain View has requested of us that there be no food or drink in the Council Chambers. We've been able to use the facility quite easily, and that's basically a no-big-deal issue. If you have food or drink, please

take it out.

As I said, I'm Rick Weissenborn. I'm the lead remedial project manager for Moffett Field. The former Naval Air Station Moffett Field, we're calling it Moffett Field tonight. I'd like to introduce some of the people that have been working on the remedial investigation/feasibility study and the

proposed plan.

Scott Gromko is the remedial project manager for the Navy's Southwest Division. We'll hear more from Scott in just a couple of minutes. We have Lee Saunders in the back of the room. He's the public affairs officer for the Navy.

We have Adriana Constantinescu, with the Regional Water Quality Control Board, and Lida Tan, of the United States Environmental Protection Agency. There's other Navy contractors, Navy personnel here. We're not going to introduce them.

We also have some restoration advisory board members here. The Co-chair isn't here. Maybe he'll come in a few minutes. The RAB is a means of public participation and holds regular bimonthly meetings. Members find out what's going on, and offer advice, suggestions from the community.

Tonight's meeting is being held as a

CERCLA requirement, and now I can't make the slides move. We need to, under the CERCLA process, formally present the information on what the proposed plan or recommended remedial alternative for the CERCLA Superfund site is. Site 27 is the Northern Channel, as you probably found out outside. We need to also offer this opportunity for comments from the public. We're about halfway through the review period. We'll give you some more of those details in a minute.

What we have on the agenda is, briefly, about ten minutes of what I'm doing now. The introduction, why are we here, what are we going to do. About a 15-or-20-minute presentation on the Site 27 history, what's been done, what's proposed. And then we'll have almost an hour, longer, if we need longer, for the comment period. We're here until everybody that has something to say has said it. 9:00 p.m., up here, is the adjourn time. As I said, if it's longer, it's longer. We'll be here until nine o'clock.

A couple of the things I would like to go through. First, if you have a comment, and you're uncomfortable stating it, coming up and speaking into the microphone, that's fine. We'll take written

comments. There is a comment sheet in the proposed plan. There's comment sheets available there and outside, if you want to pick one up when you leave. They look like this. I realize it's a real poor visual aid. You can't see it, but this is the comment form. You can write on it. You can send an e-mail to Andrea. You can fax it. The numbers are provided on the form.

Or you can present oral comments tonight. If you would like to do that, there's green speaker request cards. We've got five minutes scheduled for each person. If we need longer, as I said, we're real flexible.

If you do have comments to make orally, you're going to have to speak into the mike here. The set-up is we have a court reporter, and we have an audiotape running. This is part of our administrative record for the CERCLA action. We have to document all of this, and that's the method that we're choosing to do that.

A little background information about what we're doing. The former Naval Air Station Moffett Field, as you're aware, was transferred to the National Aeronautics and Space Administration in 1994. It was an active Navy base from about 1935,

roughly, and I'm not going to try to get exact dates right now.

It was closed on the Base Realignment Closure Program, which was an economic move by the Department of Defense, driven by Congress, to consolidate and reduce the budget for capital on real properties. Right now, it's the home of the NASA Ames Research Center. They have, basically, a research campus community plant, and the air field, as far as we know right now, will serve as a federal air field for quite a while.

There is a Navy cleanup program that is growing, essentially, nationwide. Nationwide, all the closed Navy bases, and there are a few, have to address their environmental contamination. The active bases have similar programs. They are being

more aggressive than -- the Navy is being more aggressive now than we were in the past to clean up faster and prevent -- boost prevention.

What I would like to do now is turn it over to Scott Gromko, who will tell us a little bit about the history of the site and his background.

MR. GROMKO: Thank you. Once again, my name is Scott Gromko, and I'm the remedial project manager for Site 27. I prepared a brief summary of

the proposed plan. It highlights some of the key points that are stated in this proposed plan.

To do that, I would like to just talk a little bit about the background of the site, give you an idea where the location of the site is, some history of the site and the documents that have been prepared for the site. Then I'll get into the proposed plan, and in the proposed plan, I'll talk about how we developed our cleanup alternatives and how we came up with our preferred alternative.

If I could direct your attention to the overhead over here, Site 27 is located in the northeast corner of the former NAS Moffett Field. If you're looking -- this is Highway 101 down here, and this is Hanger 1, probably the most visible feature of Moffett Field.

Site 27 consists of the Northern Channel, which is this long yellow line that extends basically through the middle of the slide. It includes the

berms of the Northern Channel, the sediment in the Northern Channel and a debris pile located at the west end of the Northern Channel.

The site also includes the associated ditches that drain into the Northern Channel, or the tributaries, and those are the Marriage Road Ditch,

the East Patrol Road Ditch and the North Patrol Road Ditch.

A little background on the site. The site is used for stormwater control. It's very important. It moves all of the stormwater from, basically, the east side of the runways, from the runways here, off the base to prevent flooding. As such, the sediment in some of the soils at Site 27 have been contaminated, and that's due to the historical activities by the Navy and NASA. Spills may have occurred back when the site was being used by the Navy, and those spills, from leaky transformers or other contaminants, were carried to the site by the rainwater, stormwater.

We know this because we've done a number of sampling efforts out there. We had a really extensive sampling effort in 2002 where we collected over 4,500 samples, and those samples included sediment and soil from the berms and the debris pile, surface water samples, and we also collected tissue samples. We collected fish and sampled them, as well as plant tissue and some of the bottom-dwelling organisms, the

benthic organisms, such as worms.

Another feature of the site is that it has a number property owners because the site is so long,

the Northern Channel. Those property owners includes NASA, Cargill, Lockheed Martin, the City of Sunnyvale. U.S. Fish and Wildlife, actually, recently bought property from Cargill, so they have property to the north of the site, and there's also some, we think, Santa Clara Water District property that's included in the site.

Some of the documents that include Site 27 are a stationwide remedial investigation, and this document basically took all of the sampling data, all of the chemical data that we know about Moffett, and evaluated the cumulative health risks. For Site 27, we found them to be low for humans.

From there, we did a sitewide ecological assessment, and the purpose of that report was to assess the ecological risks or the environmental risks the site might pose. From there, we went out and characterized the site. We wanted to define the extent of contamination, where the highest contamination is, and how far the contamination extended. We completed a physical characterization report in 2000.

After we analyzed that data, we realized we needed more data so we could accurately characterize the site. So we went out and did a data

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gap investigation in 2002 to gather more data.

Now, all of this information was used to prepare our feasibility study, and the purpose of the feasibility study was to develop cleanup numbers so that we would remove the risk the site poses to the environment, and also to come up with a cleanup alternative.

Now we're at the proposed plan stage. I would like to direct your attention over here, because we're following the CERCLA process, the Comprehensive Environmental Response, Compensation and Liability Act process, the federal process for cleaning up hazardous waste sites. So it begins with the identification of a site and the preliminary assessment and site inspection, and then you move into your investigation, which is the remedial investigation and feasibility study.

And now we're entering the decision-making process, where you identify the decision you're proposing in the proposed plan, and you highlight that decision in black and white in the Record of Decision.

From there, you would complete your cleanup, the remedial design and the remedial action, and eventually lead to site closeout, removing it

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from the NPL, from the National Priorities List.

The proposed plan, as Rick mentioned earlier, is a public communications tool, we want to hear from the community to find out what they think of our proposal to clean up the site, and it basically evaluates the evaluations and the decisions that were conducted and then completed in the feasibility study. It takes a rather large document and boils it down into a fact sheet.

Tonight we're having a public meeting, and this is the public's opportunity to come up and verbally make comments about the plan. We do have a comment period -- we're in the middle of it right now -- that extends from May 4 through June 4. So we're accepting comments through June 4.

Now, in the proposed plan, we identify the chemicals of concern. These are the chemicals that are known to be a risk, at the site, to the environment. We also identify the most sensitive receptor at the site, and by protecting this receptor, we, in turn, protect other species out there, all of the other species out there.

We also came up with a level that removes the risk to these receptors, and that's on the right side. We developed these numbers and these chemicals

and the receptors with the help of the EPA. This isn't something that the Navy did on their own. So we had a lot of help from their experts, as well as

our experts, to come up with these, and they do err on the side of conservatism. So if there are any assumptions made when we're developing these numbers, we go with the most conservative assumption.

From there, that allows us to take a look at what kind of technologies we can use to clean the site up. Initially, we came up with 21 alternatives on how we could address the risk at the site. We added initial screening to those to file them down to six alternatives. These six alternatives are highlighted in the proposed plan.

From there, we used the CERCLA guidance to do a detailed screening. We balanced our alternatives against seven of the nine criteria recommended or required by CERCLA to come up with our preferred alternative. The last two of the nine criteria are agency and community review and comments.

So we kind of short-cutted this a little bit, because we have been working with the agencies, and we have been working with the property owners to find out what their concerns are, and we have

addressed them. So they have accepted our preferred alternative that we're proposing in the proposed plan. Now, we just want to hear back from the community.

From there, we'll highlight, in black and white, our Record Of Decision of how we're going to

clean up the site, and that will make it a legally binding cleanup.

Now, I would like to talk about the six alternatives that we looked at. The first one is No Action. That would mean we won't do anything at the site, and we're required to do this under CERCLA, because it's kind of a baseline, something to compare alternatives against.

The next one is excavation of contaminated sediments and off-site disposal. What that means is we would remove the contaminated soil and sediment, from the site, that's above those cleanup goals that I showed you earlier, and transfer it to an approved facility for off-site disposal.

The next one has two parts. One is to excavate the contaminated sediments, treat it to reduce the levels of PCBs, that's ex-situ bioremediation; and also treat it to reduce the leachability of metals with stabilization, and then

dispose of the contaminated sediment off-site.

This is a variation of the one I just mentioned. It would exclude the treatment used to reduce the PCBs. It would just focus on metals. So it would excavate the contaminated sediment, treat it to address the metals, and then dispose of that at an approved facility off-site.

The fourth one has two parts also. This one is to just, basically, leave the contamination in

place, but cover it so it's not mobile. So we would use a geosynthetic cover to cover the contaminated sediments and soil, and then put a concrete cap over it. The second part of that alternative is to cover the debris pile, which I spoke about earlier, with a geosynthetic cover and concrete cap, and excavate the contaminated sediments in the channels.

Now, we took a look at these, and we compared them to the recommended criteria in the CERCLA. As I mentioned, we looked at seven of them at this point, and we used kind of a Consumer Reports approach. For each of the alternatives, we compared it against the evaluation criteria, and we either checked it with a most favorable, an acceptable or a least favorable.

Then, in the end, we counted the most

favorables, and came up with our preferred alternative, which is Alternative 2; and that was the one where we propose to excavate all the contaminated sediments and soil and bring them to an approved facility for disposal.

All of the information that I'm sharing with you is in the proposed plan if you would like to see it in more detail. This, in particular, is well-illustrated in Table 1 on Page 7.

Again, our proposed plan preferred alternative is excavation and off-site disposal, and the reason for that is because it's the easiest to

construct, and it uses a proven technology. Some of the technologies we looked at for reducing the PCBs and metals in the sediment aren't proven; they're not guaranteed to work.

So it removes the contaminated sediments and soil from the site. There's nothing left in place, where a cap would leave it in place. So it's a one-time remedy. We wouldn't have to come back and do any kind of maintenance to keep the remedy in place, and also it meets our federal and state requirements that are required by the State and the EPA.

That concludes the summary of the proposed

plan.

MR. WEISSENBORN: Thank you, Scott.

Now we're into the formal public comment period. As I mentioned earlier, if you would like to get up and speak, let's have a green card. We'll have plenty of time available for any comments. When you do your presentation, to make a statement, please use the microphone. I will stand here so you're not talking to nobody, but it's pretty uncomfortable when you're standing there, talking into the microphone.

This slide presents some of the highlights of the ground rules we have to follow. If you want to state a comment as a question, it goes as a comment as it's stated. We cannot respond to questions now.

Every comment, every question that's presented verbally or written will be responded to via the responsiveness summary in the Record Of Decision. Before it gets there, we'll have transcripts. Everything is being recorded stenographically and audibly tonight. The transcripts will be available at the Mountain View Public Library, at the information repository, for tonight's meeting.

Here is the address for Andrea Espinoza,

to make comments to. This is, again, on the back of the proposed plan. It's on the comment sheet. There are a lot of places to find this address, and if you need it before you leave tonight, if you think you may have something you want to write later, let us know, and we'll make sure you have it.

One thing I would like to emphasize is the comment period ends June 4th. This meeting is about in the middle of it. That means some people have been through everything, all the backup documents they would like to look at. Others, you still have an opportunity to do that. So your comments are welcome. Verbally, orally, written, however you would like to get them to us, please do.

If you send them by mail, just like the IRS, midnight June 4th it's due. Different day, but midnight works. Okay, now I will throw it open for comment.

If you do have comments, we'll have someone timing you, but as I mentioned, you've got a lot of time. I will ask that, when you step to the microphone, you give your name and address, and then present your statement.

Libby, would you please come up?

MS. LUCAS: This was going to be a

question, but I guess I'll phrase it differently. Basically, as I was speaking to staff before the meeting, I'm concerned about the western pond turtle, and it's very important that they not be fenced off from their normal roaming grounds. They need sandy banks to do their nesting in if you're going to have a really viable colony. You may just have a colony that is not reproducing young turtles.

So I certainly hope that, when you do your habitat conservation plan, that you do it ahead of time; and maybe that debris pile -- I'm not sure how toxic it is -- but maybe that's where they're using some of their refugia, their nesting capability.

So I think it's very important that you check out all the necessary aspects of their survival before you do anything as far as removing something that may be a little toxic, but it may not a problem to them. It certainly would be beneficial to leave them some survival capability, because as things get more and more civilized -- I mean, the golf course and everything else -- they're going to have fewer

and fewer options; and since this is the one pond turtle colony in Santa Clara County that's surviving, it's terribly, terribly important that everything that you can do to keep this group of turtles viable

is very, very essential, I think.

I guess my other thought would only be if there was any way to vacuum out the toxic sediments out from under the cleaner ones on top; but I guess you obviously have thought of every possible option, and that would not be feasible. So I guess I won't even think about that.

That's it. Thank you.

MR. ECKERT: I guess all my comment is based on what I've been reading today and what we've heard in the past. So far, I feel that the Navy is doing the right thing.

One of my concerns is, when they pick up and move large amounts of material that is already hazardous, that it be disposed of in a safe way so that doesn't leave a problem someplace else.

Other than that, I think that you've got the right idea and are doing the right thing, and I'll continue to support you on it.

MR. WEISSENBORN: Could I get you to state your name, please, for the record?

MR. ECKERT: Richard Eckert.

MR. WEISSENBORN: Thank you.

As I mentioned earlier, we'll be here

until nine o'clock if you want to go back out and

look at the displays or discuss it outside, think some more if you want to make a comment. We'll be here until nine o'clock. I'm not going to stand up here and be real quiet, and you sit right there and be real quiet. We have lots of time left if you want to go out and look at the displays or discuss it outside.

Another option we can offer, if you have a concern, if you want to make the statement to the court reporter, it will be on the record, and you won't be forced to speak into the microphone.

As I said, we're here until nine o'clock, if you want to go out and look at the displays, again, maybe new questions come up. We can answer questions outside. In here, in the formal meeting, we can't. Maybe that will help you if you have concerns. Thank you.

MS. CONSTANTINESCU: Good evening. I'm Adriana Constantinescu, engineering geologist with the State of California San Francisco Bay Regional Water Quality Control Board, and as you could see on one of the slides presented tonight, this project and the proposed plan has to receive the State acceptance.

The State Water Board has been

participating in this project from the beginning, reading all of documents presented from '96 until today; and not only, I will go back with the historical involvement of the State Water Board in this project with the first cleanup order issued by the Water Board back in time in 1985.

Tonight, as a conclusion, and as the project manager overseeing Moffett Field, and specifically Site 27, Northern Channel, I'm presenting the State acceptance of the proposed alternative, Alternative 2, first of all, because it's protective to human health and the environment, and not at the end because it will provide a permanent technical solution to the environmental problems at Site 27.

Thank you for your attention. Thank you.

MR. WEISSENBORN: It is nine o'clock, and I will now close the public meeting regarding Site 27, the Northern Channel, at Moffett Field.

(Time noted: 9:02 p.m.)

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Responsiveness Summary
for Proposed Plan
Site 27 Northern Channel
Former NAS Moffett Field
Moffett Field, California

PART I
Summary Report

Introduction

This Responsiveness Summary was prepared to address comments received from the community and other interested parties regarding the proposed remedial action selected for Site 27, the Northern Channel drainage ditches, berms, and associated debris pile, at the former Naval Air Station (NAS) Moffett Field, Moffett Field, California. Part II of this Responsiveness Summary provides a matrix with all comments received during the Site 27 Proposed Plan public comment period and the Navy's responses to those comments. Part I of the Responsiveness Summary provides an overview of the community's views on the proposed remedy for Site 27 and documents how the Navy considered public comments during the decision-making process.

Section 1 Overview

Alternative 2, Excavation and Off-site Disposal, was selected as the preferred alternative to achieve the overall remedial action objective of limiting exposure of ecological receptors to impacted sediments and soil. The preferred remedy will include permanently removing sediments and soil with chemical concentrations above established cleanup levels to protect bird species that are the most sensitive ecological receptors at the site. By protecting the most sensitive ecological receptors, the remedy also protects human health and other organisms.

Based on public comments, the preferred alternative is acceptable as a remedy to address contaminated sediments and soil at Site 27. Three commenters wished to see more detail in the plan with regard to the protection of the Western Pond Turtle colony and its habitat and would like assurances that these concerns will be considered during remedial design and remedial action. This issue is discussed in more detail in Section 3 below.

Section 2 Public Participation

The public comment period for the Site 27 Proposed Plan was held from May 4 to June 4, 2004. A public meeting was held on Thursday, May 20, 2004, at the Mountain View City Council Chambers located at 500 Castro Street, Mountain View, California 94041, from 7:30 to 9 p.m. The formal public meeting was preceded by an open house that began at 6:30 p.m. on the City Hall second floor. Ten community members attended the public meeting; two provided oral comments and one filled out and submitted a written comment form. The meeting and all oral comments were transcribed.

The Navy has had active community outreach in the environmental process at Moffett Field since the conversion of the Technical Review Committee to a Restoration Advisory Board (RAB) in 1994. The RAB is a volunteer committee that reflects the diverse interests of the local community. The RAB is chaired by the Navy and is co-chaired by a member of the community elected by the RAB. The Moffett Field RAB includes members representing the following agencies and organizations:

- Bamm Park Association Foundation
- California Native Plant Society (CNPS)
- California Regional Water Quality Control Board, San Francisco Region
- Center for Public Environmental Oversight
- City of Mountain View
- City of Sunnyvale
- Environmental professionals
- Middlefield, Ellis, Whisman (MEW) consultants
- National Aeronautics and Space Administration (NASA)
- Private citizens
- Santa Clara Valley Water District
- U.S. Environmental Protection Agency (EPA)
- Wetlands Advisory Group (WAG)

Board members serve as a liaison with the community and are available to meet with community members and groups. The RAB meets every alternate month and reviews and comments on plans and activities related to the ongoing environmental studies and restoration activities at Moffett Field. RAB members are well educated and informed about the environmental activities at Moffett Field and in the surrounding area.

In addition to an active RAB and other avenues for public involvement in the environmental process, the local media have followed the progress of environmental activities and provide a conduit for information flow to the community. Also, the Moffett Field environmental program team maintains a mailing list of over 1,820 individuals. This list is used regularly to mail notices of all environmental milestones and to disseminate information about major activities, project updates, and RAB and public meetings.

Section 3 Summary of Comments Received

As stated in Section 1 above, Alternative 2, Excavation and Off-site Disposal, was the remedy selected for removing contaminated sediments and soil from Site 27. In all, eight individuals provided comments on the Site 27 Proposed Plan. Two comments were provided orally at the public meeting and three via comment form; three comments were submitted via U.S. Postal Service (mail). In addition, one of the commenters who provided oral comments at the public meeting also e-mailed written comments.

One individual asked if and how recent federal funding decisions would impact the project; another made a statement pertaining to redevelopment; two expressed concerns about disposal, specifically, that contaminated materials removed from the site are disposed of in a safe and responsible way; one requested information about responsibility for, and level and duration of monitoring of site revegetation efforts; and three expressed concerns about the preservation and management of the western pond turtle, a California Species of Special Concern, and restoration of its habitat upon completion of the project. A list of concerns pertaining to the western pond turtle is provided here.

- The western pond turtle colony at Site 27 is a viable colony, said to be the only such colony in Santa Clara County, and its preservation needs to be assured.
- A thorough understanding of the western pond turtle mobility, feeding and nesting habits as well as its predators and other issues critical to its survival will be necessary to recover, protect and conserve the western pond turtle and restore its habitat before, during and after the project.
- The Proposed Plan for Site 27 is deficient without a Habitat Conservation Plan. A conservation plan would include appropriate fencing to allow the western pond turtle adequate egress and access and protective measures during excavation, dredging and dewatering.
- A plan should be implemented to ensure adequate habitat (water, land, nesting area, etc.) for the western pond turtle during construction and cleanup. A new channel might be developed or Jagel Slough might provide an interim habitat so that the western pond turtle colony could be moved during the remedial work.
- The Proposed Plan for Site 27 is deficient without a restoration plan to be implemented upon completion of the project. This would include addressing such habitat factors as slope, compaction, soil and sand materials, accessibility, etc.

One set of comments included requests that the Navy consider project impacts on local traffic and involve and inform local municipalities and other agencies in planning the remedial design and conducting the remedial action; consider excavating transects 2 and 4 to levels that would achieve remaining concentrations of polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT) and lead more in line with other transects; spread confirmation sampling locations more evenly to obtain a more complete picture of the site; and hold a public workshop during the remedial design/remedial action phase.

In addition to the concerns described above, several commenters indicated that, as a conceptual level plan, the Proposed Plan lacked sufficient information about remedial design and remedial action and resulting impacts for them to provide specific comments. An earnest interest in receiving and reviewing design plans was expressed to obtain a full understanding of specific impacts to a variety of issues.

Section 4 Remedial Design and Remedial Action Concerns

This section provides a summary of concerns received during the public comment period regarding design and implementation of the remedial action.

Western Pond Turtle

The Navy should ensure that all aspects of western pond turtle protection are given full and thorough consideration during development of the remedial design to minimize disruption to the local colony and its habitat. Care should be taken and protective measures incorporated during remedial design and remedial action to ensure the health and viability of the western pond turtle are maintained. This may include implementing a habitat conservation plan and/or the creation and use of an interim western pond turtle habitat to ensure that the colony is safely protected during remedial action. The Navy should consult with the San Francisco Bay National Wildlife Refuge for information pertaining to the western pond turtle.

PCB, DDT and Lead

The Navy should consider excavating Transect 2 for PCBs and Transect 4 for PCBs, DDT and lead to levels that would achieve remaining concentrations more in line with other transects. The Feasibility Study shows that remaining concentrations of these constituents will be higher than at other transects, although below the cleanup goals.

Confirmation Sampling Locations

The Navy should conduct confirmation sampling at locations different than the remedial investigation/data gaps sampling locations in addition to confirmation samplings at the remedial investigation locations, if necessary. Such spreading of the sampling locations will provide a more complete understanding of the site.

Public Workshop

The Navy should consider holding a public workshop or meeting during the remedial design/remedial action phase of the project. Such a meeting could serve to provide information about issues not addressed in the Proposed Plan and to receive comments from the public on issues that are not currently known, but may be known when the remedial design is developed (i.e., specific impacts to the western pond turtle and traffic, and other details about the cleanup activities).

Traffic

The Navy should coordinate with local agencies and municipalities during remedial design and remedial action to manage the extent to which traffic impacts local communities.

Off-Site Disposal

The Navy should ensure that contaminated materials removed from Site 27 during the remedial action are disposed of safely and responsibly.

Revised-DRAFT

Responsiveness Summary
for Proposed Plan
Site 27 Northern Channel
Former NAS Moffett Field
Moffett Field, California

PART II
Response to Comments Matrix

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Insert Matrix Here

Responsiveness Summary
for Proposed Plan
Site 27 Northern Channel
Former NAS Moffett Field
Moffett Field, California

PART II
Response to Comments Matrix

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: 30 April 2004	**Received on**: 05 May 2004
From: John R. Carter, Sr., Mountain View, California	**Submitted Via**: Public comment form
Affiliation/Agency: Public member	

GENERAL COMMENTS

Comment 1: In all of the proposed alternatives, no mention was made as to where the removed contaminated soil would be sent to. I am as concerned about that as I am about contaminants locally. I am interested in knowing how the contaminants can be neutralized - aside from dispersing them evenly throughout the globe. (scrubbing techniques)	**Response 1:** All soil and sediment removed during the project will be laboratory tested for hazardous constituents. Material containing constituents at concentrations that are determined to be representative of hazardous waste will be transported for final disposal to a United States Environmental Protection Agency- (EPA-) approved hazardous waste landfill permitted under the Resource Conservation and Recovery Act (RCRA). Material containing hazardous substances at concentrations that require removal, but at concentrations below what is considered hazardous waste, will be transported for disposal to an EPA-approved RCRA solid waste landfill permitted to accept this material. There are several permitted and EPA-approved RCRA hazardous and solid waste landfills in California. There are no viable means of neutralizing the contaminants in place. One of the alternatives (Alternative 4) evaluated covering or capping some or all of the contaminated sediments and soil in place to reduce the potential for exposure; however, this does not remove or lower the concentrations of contamination and would require ongoing maintenance of the cap to prevent migration of the contaminants. Another alternative (Alternative 3) proposed removing the contaminated materials and treating them on site to lessen their toxicity. There are various forms of treatment that could be applied to stabilize the contaminants within the soil matrix once it has been excavated, but this material will still need to be placed somewhere (such as a controlled landfill) where it will not leach contaminants into the environment over time.

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Site 27, Northern Channel
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Moffett Field, California

Written on: 08 May 2004	**Received on**: 11 May 2004
From: Andrew John, Mountain View, California	**Submitted Via**: Public comment form
Affiliation/Agency: Public member	
GENERAL COMMENTS	
Comment 1: I agree Alternative 2 is the best. So when can we start building houses or condos? We should build towers so rich retirees can look over the bay and pay big taxes to the City of Mountain View.	**Response 1:** The Navy appreciates your concurrence with the preferred alternative. Once the remedial action has been completed and approved by EPA, the Navy will have fulfilled its responsibility for environmental cleanup for this site. With respect to use-related issues, the National Aeronautics and Space Administration (NASA) is the federal property holder, pursuant to the Navy's federal transfer of the former NAS Moffett Field facility to NASA in 1994.

Written on: 20 May 2004	**Received on**: 20 May 2004
From: Mavis E. Petra, Campbell, California	**Submitted Via**: Public comment form
Affiliation/Agency: Public Member	
GENERAL COMMENTS	
Comment 1: I heard that President Bush has pulled funding for Superfund sites. Is this information accurate and, if so, how does it impact this project?	**Response 1:** The Navy does not possess sufficient information to confirm the accuracy or inaccuracy of your statement regarding the Superfund; however, the Navy receives funding for environmental cleanup of its closed facilities through the Department of Defense's (DoD's) Base Realignment and Closure program, which follows the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process. While some of these facilities (including former NAS Moffett Field) are on the National Priorities List (NPL), or "Superfund" list of the nation's most contaminated sites, the DoD funding is not tied directly to the EPA's "Superfund" oversight program. The Navy is confident that sufficient funding from the DoD will be available to complete the cleanup of Site 27 once the Record of Decision for the site is completed and approved, which is the next step in the cleanup process.

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Site 27, Northern Channel
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Moffett Field, California

Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

Comment 1: [oral] This was going to be a question, but I guess I'll phrase it differently. Basically, as I was speaking to staff before the meeting. I'm concerned about the Western Pond Turtle, and it's very important that they not be fenced off from their normal roaming ground. They need sandy banks to do their nesting in if you're going to have a really viable colony. You may just have a colony that is not reproducing young turtles. So I certainly hope, when you do your habitat conservation plan, that you do it ahead of time; and maybe that debris pile -- I'm not sure how toxic it is -- but maybe that's where they're using some of their refugia, their nesting capability. So I think it's very important that you check out all the necessary aspects of their survival before you do anything as far as removing something that may be a little toxic, but may not be a problem to them. It certainly would be beneficial to leave them some survival capability, because as things get more and more civilized -- I mean, the golf course and everything else -- they're going to have fewer and fewer options; and since this is the one pond turtle colony in Santa Clara County that's surviving, it's terribly, terribly important that everything that you can do to keep this group of turtles viable is very essential, I think.	**Response 1:** The habits and migration patterns of the Western Pond Turtle provide a very high degree of confidence that the cleanup actions will have minor impacts on the colony, if at all. Important information about the species is provided here. Western Pond Turtles in a stream or drainage environment are highly variable in their movements. Some individuals nest, aestivate, or over-winter considerable distances (e.g., 400 m; Personal Communication Brent Helm, 2003; California Department of Fish and Game [CDFG], 1994; Storer, 1930; Rathbun et al., 1992; 1993) from their resident stream or drainage environment. Western Pond Turtles have been documented migrating significant distances (at least 2 km) if the local aquatic habitat changes (e.g., disappears), and adult turtles can tolerate at least seven days without water (Personal Communication Brent Helm, 2003; CDFG, 1994; Storer, 1930; Rathbun et al., 1992; 1993). Within 1,000 feet of the potentially affected habitat, other features suitable to the Western Pond Turtle habitat exist. The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. It is not anticipated that the proposed actions will result in a "take" of any Western Pond Turtles as defined by the CDFG or Federal Endangered Species Act. However, since the Western Pond Turtle is a California State Species of Concern, it has and will continue to receive special consideration, e.g., construction timing restrictions and monitoring. The avoidance and conservation measures will reduce potential adverse impacts to the local Western Pond Turtle population. Project actions will be minimized to the maximum extent practicable during the breeding season (April to August) and hatching season (late summer to early fall). The drainage features that could be potentially impacted are upland features that have been excavated for water conveyance.

Written on: N/A **From**: Libby Lucas, Los Altos, California **Affiliation/Agency**: RAB Member	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004 **Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
GENERAL COMMENTS	
	LITERATURE CITED AND COMMUNICATIONS ▪ California Department of Fish and Game (CDFG). 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division 1701, Nimbus Road, Rancho Cordova, CA, under contract (8023). ▪ Jennings and M. Hayes, Eds. Storer, T.L. 1930. Notes on the range and life history of the pacific fresh water turtle, Clemmys mormorata. University of California Publications in Zoology 35(5): 429-441. ▪ Rathbun, G.B., N. Siepel, and D.C. Holland. 1992. Nesting Behavior and movements of western pond turtles (Clemmys mormorata). The Southwestern Naturalist 37(3): 319-324. ▪ Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and Ecology of sensitive aquatic vertebrates in the lower San Simeon and Pico Creeks, San Luis Obispo County, CA. Unpublished Report, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, CA, under Cooperative Agreement (14-16-0009-91-1909 Brent Helm, PhD. 2003. Professor at Sacramento State College and Independent Herpetologist. Possess a valid California Department of Fish and Game Permit to handle and relocate Western Pond Turtles.
Comment 2: [oral] I guess my other thought would only be if there was any way to vacuum out the toxic sediments out from under the cleaner ones on top. But I guess you obviously have thought of every possible option, and that would not be feasible. So I guess I won't even think about that. That's it, thank you.	**Response 2:** During the Feasibility Study, 21 different alternatives were evaluated. These included excavation and off-site disposal. One of the proposed methods in the Feasibility Study was hydraulic dredging. This method uses suction hoses to remove sediment; however, there is no way to differentiate the clean sediment from the contaminated sediment below the water surface during dredging. This method is significantly more expensive than conventional excavation and would not accomplish the task of leaving the clean sediment in place after dredging. The final method for removing the sediment will be determined during the remedial design phase.

Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

Comment 3: [e-mail] Please consider this an addendum to my May 29, 2004 submittal to you in regards the final remedial plan for the Moffett Field - Northern Channel - Site 27 cleanup. Since the Habitat Conservation Plan for the Western Pond Turtle is not incorporated into the proposed toxics cleanup plan for Site 27, which includes Northern Channel, Marriage Road Ditch, Patrol Road Ditch and North Patrol Road Ditch, it is necessary to implement an HCP and recovery program before the remedial work is initiated. As stated earlier, the initial Environmental Impact Statement for Moffett Field located the colony of Western Pond Turtle here in the Northern Channel, and identified it as a California Species of Special Concern. It is the only Western Pond Turtle colony known to exist in Santa Clara County. As all the alternatives for the cleanup of Site 27 appear to omit any consideration of how to preserve the health and survival of adults and juveniles of Western Pond Turtle in the project site, it seems imperative to establish a self-contained recovery program on site, preliminary to any approval of the proposed toxics cleanup plan. Thus, my suggestion of an addendum to the proposed Moffett Field - Site 27 - Northern Channel Plan is to create a parallel new channel outboard of the present Northern Channel, in the salt ponds of the Don Edwards National Wildlife Refuge, and to move the colony of Western Pond Turtle there during remedial channel work. This would entail the creation of a dirt mound equivalent to the structure, volume and potential of refugia of the present debris pile at the western end of the new channel. It would appear that present fencing that surrounds the Northern Channel and debris pile still enables the turtles to access the wetlands of North Patrol Road, Patrol Road and Marriage Road Ditches. It may also protect the turtles from predation by red fox. It is essential that the	**Response 3:** The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. No formal habitat conservation plan - Section 10 or Section 7 Federal Endangered Species Act - consultation is required for the proposed action. The Federal Endangered Species Act and its implementing regulations prohibit the "take" of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10(a)(1)(B) of the Act. In the federal sense, “take” is defined in the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Federal regulation 50 Code of Federal Regulations (CFR) 17.3 further defines the term "harm" in the “take” definition to mean any act that actually kills or injures a federally listed species. Section 10(a) of the Act establishes a process for obtaining an "incidental take permit," which authorizes non-federal entities to incidentally take federally listed wildlife or fish subject to certain conditions. “Incidental take” is defined by the Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Preparation of a Habitat Conservation Plan is required for all Section 10(a) permit applications. The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have joint authority under the Act for administering the incidental take Additionally, once the ROD is completed, further study and assessment of management options associated with the local Western Pond Turtle colony will be conducted by the Navy in conjunction with local resource specialists.

Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS	
recovery program and Habitat Conservation Plan preserves this protection and yet provides ease of access to surrounding wetlands. It needs to be established just how the turtles get around or under fencing, how large an opening is needed to pass the larger ones and yet protect juveniles from incoming predators. Circulation will also have to be designed so that the turtles can pass through the present debris pile site, not only after it is removed, but probably during excavation of the channel and pile? What were the results of the field studies that it was implied would be conducted at the time of the original environmental review? Does there need to be seasonal migration route consideration incorporated into the channel work? This proposed habitat conservation plan for the Western Pond Turtle colony should probably result in a Bay Trail alignment that would provide sufficient habitat buffer for the turtles yet still leave them visable [sic] for observation and appreciation. As I have come away on vacation without my official mail-in forms from the public meeting on Moffett Field - Site 27, please accept this and my previous submittal of May 29 as my comments on the proposed clean-up plan for the Northern Channel. Thank you for your continued kind consideration.	

Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

Comment 4: [e-mail] Ever since reading the original EIR/EIS for the Moffett Field remedial restoration, I have been waiting to see an HCP (Habitat Conservation Plan) for Western Pond Turtle. The Western Pond Turtle is presently now found here as a viable colony, and appears to have historically lived in this Northern Channel Site 27 and its preservation needs to be assured. This is said to be the only Western Pond Turtle colony in Santa Clara County, and as a California Species of Special Concern, it is mandatory that it be an indicator species in the Habitat Conservation Plan for the Northern Channel, North Patrol Road Ditch, Marriage Road Ditch, and Patrol Road Ditch. As the Proposed Plan for Site 27, the Northern Channel, does not include any such HCP nor is one used to evaluate any of the alternatives for clean-up, I find the Site 27 Proposed Plan deficient. An analysis must be made of the excavation staging process necessary to assure that a sufficient acreage of water oriented habitat is maintained for Western Pond Turtles during dewatering of channel and ditches, and removal of contaminated soils. Then, the debris pile is an essential element in this Western Pond Turtle habitat, for nesting and refugia, and this must be replicated by similar habitat for the viability of the species. Not to have included any documentation of this habitat restoration, as to method or location of a permanent dirt pile, is a fatal deficiency in this proposed plan. The steepness of slope in the banks of the Northern Channel is mentioned but there appears to be no scientific data presented on the degree of slope and compaction of bank that will be designed for, in the remedial restoration plan. This is a deficiency. Will appropriate criteria be defined that will insure [sic] that the pond turtles (old and young) will be able to access and egress the Northern Channel and adjacent Moffett Field Ditches?	**Response 4:** The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. Therefore, no formal habitat conservation plan, Section 10, or Section 7 Federal Endangered Species Act consultation is required for the proposed action. Preparation of a Habitat Conservation Plan is required for all Section 10(a) permit applications pursuant to Federal Endangered Species Act requirements. The habits and migration patterns of the Western Pond Turtle provide a very high degree of confidence that the cleanup actions will have minor impacts on the colony, if at all. Important information about the species is provided here. Western Pond Turtles in a stream or drainage environment are highly variable in their movements. Some individuals nest, aestivate, or over-winter considerable distances (e.g., 400 m; Personal Communication Brent Helm, 2003; California Department of Fish and Game [CDFG], 1994; Storer, 1930; Rathbun et al., 1992; 1993) from their resident stream or drainage environment. Western Pond Turtles have been documented migrating significant distances (at least 2 km) if the local aquatic habitat changes (e.g., disappears), and adult turtles can tolerate at least seven days without water (Personal Communication Brent Helm, 2003; CDFG, 1994; Storer, 1930; Rathbun et al., 1992; 1993). Within 1,000 feet of the potentially affected habitat, other features suitable to the Western Pond Turtle habitat exist. It is not anticipated that the proposed actions will result in a “take” of any Western Pond Turtles as defined by the CDFG or Federal Endangered Species Act. However, since the Western Pond Turtle is a California State Species of Concern, it has and will continue to receive special consideration, e.g., construction timing restrictions and monitoring.

Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

What is the particular soil type recommended for these banks and the dirt pile for the Western Pond Turtle? What amount of present soils can be retained? What measures will be incorporated into the excavation plan so that large and small turtles will not be sucked up into the dredging equipment or into dewatering pumps? Will there be enforcible [sic] regulatory criteria in the project contract to assure that the Northern Channel and the Ditches will not be dewatered simultaneously? Will some continuity of access for the Western Pond Turtles be maintained between the deep water and the hauling-out or sunning banks?

Can the Western Pond Turtles navigate under or around the extensive fencing that is presently along the Northern Channel? Will equivalent ease of access be retained in the fencing of the proposed replacement habitat? Will the replacement/restoration nesting and refugia dirt pile be made equally accessible? The proposed alignment of the Bay Trail runs along the bay levee outboard of the Northern Channel. Will this be the recommended Bay Trail location, or will it be considered as too close in proximity to this colony of Western Pond Turtles?

Please consider this a place holder for my serious concerns on this Proposed Plan. I will try to file further comments by mail in time to meet the June 4 deadline. Thank you for your kind review and for the public workshop on the Northern Channel.

The avoidance and conservation measures will reduce potential adverse impacts to the local Western Pond Turtle population. Project actions will be minimized to the maximum extent practicable during the breeding season (April to August) and hatching season (late summer to early fall). The drainage features that could be potentially impacted are upland features that have been excavated for water conveyance.

Additionally, once the ROD is completed, further study and assessment of management options associated with the local Western Pond Turtle colony will be conducted by the Navy in conjunction with local resource specialists.

LITERATURE CITED AND COMMUNICATIONS

- California Department of Fish and Game (CDFG). 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division 1701, Nimbus Road, Rancho Cordova, CA, under contract (8023).
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Written on: N/A	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004
From: Libby Lucas, Los Altos, California	**Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

Comment 5: [e-mail] Thank you for acknowledging receipt of last two communiqués on Moffett Field - Site 27 - Northern Channel, and afraid I have one more postscript... As an interim habitat for the Western Pond Turtle colony, while the Northern Channel and adjacent drainage ditches are being dredged, perhaps Jagel Slough would offer the best wetlands habitat for the turtles. (If the Northern Channel is at 12:15 Jagel Slough is at 12 noon, so it is really close by and should be comparable habitat.) The only drawback would be that the slough is already in the Wildlife Refuge and so the fencing requirement would have to be a special condition. In recent years a red fox den was noted in this inboard location on Jagel Slough, I believe, so the predator protection element must be included. Then, a debris pile/dirt mound with some equivalent structure that can be burrowed into for turtle nests, would also have to be constructed at the inboard end of Jagel Slough, and also included in the fenced area. Access to the historic wetlands of the three ditches, North Patrol Road, Patrol Road and Marriage Road, should be made available when ditches are not being worked on. This would be reviewed in the Habitat Conservation Plan as a seasonal need, and might affect the excavation schedule for toxic cleanup of the site. Do think this will be an important interface with the South Bay Salt Pond Restoration Plan and will be very important as a showpiece of inter-agency cooperation. International tour busses are already dropping tours off to visit the adjacent Mountain View Shoreline Park and Palo Alto Baylands, so this salvaging of the Western Pond Turtle Colony will be extremely valuable to International public relations as well as to this California Species of Special Concern. Thank you again for your consideration of these concerns on the Northern Channel.	**Response 5:** The habits and migration patterns of the Western Pond Turtle provide a very high degree of confidence that the cleanup actions will have minor impacts on the colony, if at all. Important information about the species is provided here. Western Pond Turtles in a stream or drainage environment are highly variable in their movements. Some individuals nest, aestivate, or over-winter considerable distances (e.g., 400 m; Personal Communication Brent Helm, 2003; California Department of Fish and Game [CDFG], 1994; Storer, 1930; Rathbun et al., 1992; 1993) from their resident stream or drainage environment. Western Pond Turtles have been documented migrating significant distances (at least 2 km) if the local aquatic habitat changes (e.g., disappears), and adult turtles can tolerate at least seven days without water (Personal Communication Brent Helm, 2003; CDFG, 1994; Storer, 1930; Rathbun et al., 1992; 1993). Within 1,000 feet of the potentially affected habitat, other features suitable to the Western Pond Turtle habitat exist. The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. It is not anticipated that the proposed actions will result in a "take" of any Western Pond Turtles as defined by the CDFG or Federal Endangered Species Act. No formal habitat conservation plan, Section 10, or Section 7 Federal Endangered Species Act consultation is required for the proposed action. Preparation of a Habitat Conservation Plan is required for all Section 10(a) permit applications pursuant to Federal Endangered Species Act requirements. However, since the Western Pond Turtle is a California State Species of Concern, it has and will continue to receive special consideration, e.g., construction timing restrictions and monitoring. The avoidance and conservation measures will reduce potential adverse impacts to the local Western Pond Turtle population. Project actions will be minimized to the maximum extent practicable during the breeding season (April to August) and hatching season (late summer to early fall).

Written on: N/A **From**: Libby Lucas, Los Altos, California **Affiliation/Agency**: RAB Member	**Received on**: 20 May 2004; 29 May 2004; 04 June 2004 **Submitted Via**: Public Meeting (oral); e-mails to Andrea Espinoza
GENERAL COMMENTS	
	The drainage features that could be potentially impacted are upland features that have been excavated for water conveyance. Additionally, once the ROD is completed, further study and assessment of management options associated with the local Western Pond Turtle colony will be conducted by the Navy in conjunction with local resource specialists. **LITERATURE CITED AND COMMUNICATIONS** ▪ California Department of Fish and Game (CDFG). 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division 1701, Nimbus Road, Rancho Cordova, CA, under contract (8023). ▪ Jennings and M. Hayes, Eds. Storer, T.L. 1930. Notes on the range and life history of the pacific fresh water turtle, Clemmys mormorata. University of California Publications in Zoology 35(5): 429-441. ▪ Rathbun, G.B., N. Siepel, and D.C. Holland. 1992. Nesting Behavior and movements of western pond turtles (Clemmys mormorata). The Southwestern Naturalist 37(3): 319-324. ▪ Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and Ecology of sensitive aquatic vertebrates in the lower San Simeon and Pico Creeks, San Luis Obispo County, CA. Unpublished Report, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, CA, under Cooperative Agreement (14-16-0009-91-1909 Brent Helm, PhD. 2003. Professor at Sacramento State College and Independent Herpetologist. Possess a valid California Department of Fish and Game Permit to handle and relocate Western Pond Turtles.

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: N/A	**Received on**: 20 May 2004
From: Richard Eckert, Los Altos, California	**Submitted Via**: Public Meeting (oral)
Affiliation/Agency: RAB Member	

GENERAL COMMENTS

Comment 1: I guess all my comment is based on what I've been reading today and what we've heard in the past. So far, I feel that the Navy is doing the right thing. One of my concerns is, when they pick up and move large amounts of material that is already hazardous, that it be disposed of in a safe way and doesn't leave a problem someplace else. Other than that, I think that you've got the right idea and are doing the right thing, and I'll continue to support you on it.	**Response 1:** All soil and sediment removed during the project will be laboratory tested for hazardous constituents. Material containing constituents at concentrations that are determined to be representative of hazardous waste will be transported for final disposal to a United States Environmental Protection Agency- (EPA)-approved hazardous waste landfill permitted under the Resource Conservation and Recovery Act (RCRA). Material containing hazardous substances at concentrations that require removal, but at concentrations below what is considered hazardous waste, will be transported for disposal to an EPA-approved RCRA solid waste landfill permitted to accept this material. There are several permitted and EPA-approved RCRA hazardous and solid waste landfills in California. There are no viable means of neutralizing the contaminants in place. One of the alternatives (Alternative 4) evaluated covering or capping some or all of the contaminated sediments and soil in place to reduce the potential for exposure; however, this does not remove or lower the concentrations of contamination and would require ongoing maintenance of the cap to prevent migration of the contaminants. Another alternative (Alternative 3) proposed removing the contaminated materials and treating them on site to lessen their toxicity. There are various forms of treatment that could be applied to stabilize the contaminants within the soil matrix once it has been excavated, but this material will still need to be placed somewhere (such as a controlled landfill) where it will not leach contaminants into the environment over time.

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: 01 June 2004	**Received on**: 08 June 2004
From: Kevin Woodhouse, Environmental Management Coordinator	**Submitted Via**: U.S. Postal Service (mail)
Affiliation/Agency: RAB Member representing the City of Mountain View	

GENERAL COMMENTS

Comment 1: The City of Mountain View appreciates the opportunity to comment on the Site 27 -- Northern Channel -- proposed plan. City staff has reviewed the proposed plan and is conceptually supportive of the preferred clean-up alternative, "Alternative 2 -- Excavation and Off-Site Disposal." However, successful implementation of this alternative will depend on many details that need to be addressed either now or during the remedial design phase of the project. Therefore, City staff would like to submit the following comments for the record that should either be addressed during consideration of modifying the preferred alternative before the record of decision is finalized or during remedial design of the alternative:

1. *Traffic Impacts*: Off-site hauling and disposal of the excavated sediments and hauling of clean backfill soil will generate approximately 7,000 to 8,000 truck trips. Traffic impacts of this magnitude need to be coordinated with surrounding jurisdictions, including the City of Mountain View, the City of Sunnyvale and Caltrans, particularly in light of the major Highways 85/101 interchange project currently under construction.
2. *Remaining PCB, DDT and Lead Concentrations*: Transect 2 for PCBs and Transect 4 for PCBs, DDT and lead on Figure 6-1 in the feasibility study show anticipated remaining contaminant concentrations significantly higher than other transects. These transects are proposed for sediment removal to 1' below surface. Despite these concentrations being below the clean-up goals, consideration should be given to excavating these transects to levels that would achieve remaining concentrations more in line with other transects.

Response 1:

1. The Navy recognizes the need to coordinate with Caltrans, the City of Mountain View, and the City of Sunnyvale to mitigate traffic impacts related to the preferred alternative. A detailed traffic plan will be provided with the remedial design and will describe mitigation measures addressing impacts of trucking operations. The effects of the construction on the 85/101 interchange will be included in the traffic plan.
2. Approved cleanup levels have been established for the site that are protective of human health and the environment. Conservative assumptions were employed to develop these levels. Therefore, removing soil with contaminant concentrations below the approved cleanup level would not be appropriate.
3. A confirmation sampling plan will be provided with the remedial design. It will be structured to provide appropriate coverage to ensure that the approved cleanup levels have been achieved. The use of additional locations, other than those previously used, will be evaluated during development of the sampling plan. This confirmation sampling plan will be available for comment prior to being finalized.
4. The Navy understands the importance of ensuring successful revegetation of the impacted area and a plan to address this need will be developed as a part of the remedial design. This plan will identify plant species of interest, method and techniques of revegetation, time period for mitigation and the responsible parties.

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: 01 June 2004	**Received on**: 08 June 2004
From: Kevin Woodhouse, Environmental Management Coordinator	**Submitted Via**: U.S. Postal Service (mail)
Affiliation/Agency: RAB Member representing the City of Mountain View	

GENERAL COMMENTS

3. *Locations for Confirmation Sampling*: Confirmation samplings should be taken at locations different from (perhaps spread equidistant between) the remedial investigation/data gaps sampling locations in addition to confirmation samplings at the RI locations, if necessary. Such spreading of the sampling locations will give a more complete picture.
4. *Monitoring of Revegetation*: Ongoing monitoring responsibility for successful revegetation of the channel is not addressed in the proposed plan. Will the Navy monitor revegetation, and for how many years, to ensure proper plant species and growth occur? Or will NASA undertake this ongoing responsibility as part of their storm water system management?
5. *Western Pond Turtle*: More analysis about the western pond turtle's habits, habitats and relocation feasibility should be conducted by appropriate experts before selecting a clean-up alternative that requires them to be relocated.

Public Workshop During RD/RA Phase: Consideration should be given to holding a public workshop meeting during the remedial design/remedial action phase of the project to inform and get input from the public on many of the issues, such as those addressed above, that are important to the success of this project but are not addressed in sufficient detail in the proposed plan.

5. The habits and migration patterns of the Western Pond Turtle provide a very high degree of confidence that the cleanup actions will have minor impacts on the colony, if at all. Important information about the species is provided here. Western Pond Turtles in a stream or drainage environment are highly variable in their movements. Some individuals nest, aestivate, or over-winter considerable distances (e.g., 400 m; Personal Communication Brent Helm, 2003; California Department of Fish and Game [CDFG], 1994; Storer, 1930; Rathbun et al., 1992; 1993) from their resident stream or drainage environment. Western Pond Turtles have been documented migrating significant distances (at least 2 km) if the local aquatic habitat changes (e.g., disappears), and adult turtles can tolerate at least seven days without water (Personal Communication Brent Helm, 2003; CDFG, 1994; Storer, 1930; Rathbun et al., 1992; 1993). Within 1,000 feet of the potentially affected habitat, other features suitable to the Western Pond Turtle habitat exist.

   The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. It is not anticipated that the proposed actions will result in a "take" of any Western Pond Turtles as defined by the CDFG or Federal Endangered Species Act. However, since the Western Pond Turtle is a California State Species of Concern, it has and will continue to receive special consideration, e.g., construction timing restrictions and monitoring. The avoidance and conservation measures will reduce potential adverse impacts to the local Western Pond Turtle population. Project actions will be minimized to the maximum extent practicable during the breeding season (April to August) and hatching season (late summer to early fall). The drainage features that could be potentially impacted are upland features that have been excavated for water conveyance.

Written on: 01 June 2004	**Received on**: 08 June 2004
From: Kevin Woodhouse, Environmental Management Coordinator	**Submitted Via**: U.S. Postal Service (mail)
Affiliation/Agency: RAB Member representing the City of Mountain View	

GENERAL COMMENTS

LITERATURE CITED AND COMMUNICATIONS

- California Department of Fish and Game (CDFG). 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division 1701, Nimbus Road, Rancho Cordova, CA, under contract (8023).
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- Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and Ecology of sensitive aquatic vertebrates in the lower San Simeon and Pico Creeks, San Luis Obispo County, CA. Unpublished Report, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, CA, under Cooperative Agreement (14-16-0009-91-1909 Brent Helm, PhD. 2003. Professor at Sacramento State College and Independent Herpetologist. Possess a valid California Department of Fish and Game Permit to handle and relocate Western Pond Turtles.

The Navy agrees that the public may have significant comments on aspects of the remedial design which cannot be addressed in detail at the Proposed Plan stage. The Navy has always supported forums to entertain and address such comments. Public workshops, RAB meetings, RAB subcommittee meetings and other venues will be considered to determine the most effective way to facilitate future public comments on this project.

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: 04 June 2004	**Received on**: 21 June 2004
From: James M. Fiedler, Chief Operating Officer, Watersheds	**Submitted Via**: U.S. Postal Service (mail)
Affiliation/Agency: Santa Clara Valley Water District	

GENERAL COMMENTS

Comment 1: The Santa Clara Valley Water District (District) is the primary water resources agency for Santa Clara County, providing watershed stewardship, flood protection and water supply throughout the five major watersheds of the County. The District serves 1.7 million residents, and oversees 700 linear miles of streams that drain 1,300 square miles. In the vicinity of Site 27 -- Northern Channel, the District owns property and operates facilities at the former Cargill salt evaporator Pond A4, to the east of the site, as well as Sunnyvale West Channel, which drains the land to the south and empties into Moffett Channel. On behalf of the District, I would like to thank you for the opportunity to review the Former NAS Moffett Field Site 27 -- Northern Channel Proposed Plan (April 2004). The District understands that Alternative 2 (Excavation and Off-Site Disposal) has been selected as the preferred alternative and that this is a conceptual level plan, which will be followed by a remedial design phase that will address the specific details of conducting the cleanup activities. At this time, our main concern is that the conceptual level alternatives do not contain sufficient detail to allow the District to assess potential implications for our facilities in the vicinity. Without this level of detail, it is difficult for the District to support any of the four alternatives listed in the plan. We understand that the development of specific project details during the remedial design phase will provide the level of detail desired by the District, but only for the preferred alternative. Providing more detail on the other alternatives at that stage may be helpful for garnering support for the project from others, as well as from the District.	**Response 1:** The Navy understands that details which will be provided in the remedial design allow for a more comprehensive evaluation of the proposed remedial alternative. However, it would not be practicable to develop remedial designs for all of the alternatives evaluated in the Feasibility Study. The CERCLA process identifies a tiered process in which a number of alternatives are evaluated in the Feasibility Study using prescribed criteria to determine the most favorable alternative. After this evaluation, the process is designed to focus on the preferred alternative from the Proposed Plan phase through to the Record of Decision, which legally documents the proposed remedy.

Revised-DRAFT
Responsiveness Summary for Proposed Plan
Site 27, Northern Channel
Former NAS Moffett Field
Moffett Field, California

Written on: Unknown	**Received on:** 08 June 2004
From: Florence LaRiviere, Chair	**Submitted Via:** U.S. Postal Service (mail)
Affiliation/Agency: Citizens Committee to Complete the Refuge	
GENERAL COMMENTS	
Comment 1: We appreciate the efforts of the Navy to clean up contaminated sites from the Moffett Field area and we are especially interested in Site 27. This area is especially noteworthy because it is home to a rare Western Pond Turtle colony. This species is state listed as a Species of Special Concern but we are respectfully requesting that we be supplied with detailed comments on the species on this site by the US Fish and Wildlife Service because it is managing surrounding lands under new ownership arrangements. We suggest consultation with Ms. Joy Albertson of the San Francisco Bay National Wildlife Refuge, telephone number (510) 792-0222. She could assess the chances of survival of the established colony, or places to which it could be removed. It would appear that the work projected in Site 27 and the surrounding channels will severely disrupt the habitat currently used by the species. Perhaps an alternate site could be found for the animals to insure their survival.	**Response 1:** The habits and migration patterns of the Western Pond Turtle provide a very high degree of confidence that the cleanup actions will have minor impacts on the colony, if at all. Important information about the species is provided here. Western Pond Turtles in a stream or drainage environment are highly variable in their movements. Some individuals nest, aestivate, or over-winter considerable distances (e.g., 400 m; Personal Communication Brent Helm, 2003; California Department of Fish and Game [CDFG], 1994; Storer, 1930; Rathbun et al., 1992; 1993) from their resident stream or drainage environment. Western Pond Turtles have been documented migrating significant distances (at least 2 km) if the local aquatic habitat changes (e.g., disappears), and adult turtles can tolerate at least seven days without water (Personal Communication Brent Helm, 2003; CDFG, 1994; Storer, 1930; Rathbun et al., 1992; 1993). Within 1,000 feet of the potentially affected habitat, other features suitable to the Western Pond Turtle habitat exist. The Western Pond Turtle is a California State Species of Concern; it is neither a State nor Federal Endangered Species Act listed candidate, threatened, or endangered species. It is not anticipated that the proposed actions will result in a "take" of any Western Pond Turtles as defined by the CDFG or Federal Endangered Species Act. However, since the Western Pond Turtle is a California State Species of Concern, it has and will continue to receive special consideration, e.g., construction timing restrictions and monitoring. The avoidance and conservation measures will reduce potential adverse impacts to the local Western Pond Turtle population. Project actions will be minimized to the maximum extent practicable during the breeding season (April to August) and hatching season (late summer to early fall). The drainage features that could be potentially impacted are upland features that have been excavated for water conveyance.

Written on: Unknown	**Received on:** 08 June 2004
From: Florence LaRiviere, Chair	**Submitted Via:** U.S. Postal Service (mail)
Affiliation/Agency: Citizens Committee to Complete the Refuge	
GENERAL COMMENTS	
	Additionally, once the ROD is completed, further study and assessment of management options associated with the local Western Pond Turtle colony will be conducted by the Navy in conjunction with local resource specialists. **LITERATURE CITED AND COMMUNICATIONS** ▪ California Department of Fish and Game (CDFG). 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division 1701, Nimbus Road, Rancho Cordova, CA, under contract (8023). ▪ Jennings and M. Hayes, Eds. Storer, T.L. 1930. Notes on the range and life history of the pacific fresh water turtle, *Clemmys mormorata*. University of California Publications in Zoology 35(5): 429-441. ▪ Rathbun, G.B., N. Siepel, and D.C. Holland. 1992. Nesting Behavior and movements of western pond turtles (*Clemmys mormorata*). The Southwestern Naturalist 37(3): 319-324. ▪ Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and Ecology of sensitive aquatic vertebrates in the lower San Simeon and Pico Creeks, San Luis Obispo County, CA. Unpublished Report, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, CA, under Cooperative Agreement (14-16-0009-91-1909 Brent Helm, PhD. 2003. Professor at Sacramento State College and Independent Herpetologist. Possess a valid California Department of Fish and Game Permit to handle and relocate Western Pond Turtles. With regard to your request for detailed comments from USFWS on the Species of Special Concern, the Western Pond Turtle, it is recommended that you contact that agency directly.

APPENDIX C
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE NORTHERN CHANNEL

TABLE OF CONTENTS

TABLES

ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or relevant and appropriate requirement
CCR	*California Code of Regulations*
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
EPA	U.S. Environmental Protection Agency
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
PCB	Polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
USC	*United States Code*

C1 INTRODUCTION

This appendix sets forth the applicable or relevant and appropriate requirements (ARAR) for this Record of Decision for Site 27, which consists of the Northern Channel and related areas, at former Naval Air Station Moffett Field.

C1.1 SUMMARY OF COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT AND NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN REQUIREMENTS

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (Title 42 *United States Code* Section 9621[d]), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (U.S. Environmental Protection Agency [EPA] 1988a). A requirement must be determined to be both relevant and appropriate in order to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in Title 40 *Code of Federal Regulations* (CFR) Section 300.400(g)(2), and include the following:

- The purpose of the requirement and the purpose of the CERCLA action
- The medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site
- The substances regulated by the requirement and the substances found at the CERCLA site

- Any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site
- The type of place regulated and the type of place affected by the release or CERCLA action
- The type and size of structure or facility regulated and the type and size of structure or facility affected by the release or contemplated by the CERCLA action
- Any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site

According to CERCLA ARARs guidance (EPA 1988a), a requirement may be "applicable" or "relevant and appropriate," but not both. Identification of ARARs must be done on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is nevertheless both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable (EPA 1988b).

Tables included in this appendix present each potential ARAR with a determination of status (that is, applicable or relevant and appropriate). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated, and whether the requirement was well suited to the site.

To qualify as a state ARAR under CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a state requirement must be:

- A state law
- An environmental or facility siting law
- Promulgated (of general applicability and legally enforceable)
- Substantive (not procedural or administrative)
- More stringent than the federal requirement
- Identified in a timely manner
- Consistently applied

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or nonenvironmental, including permit requirements, are not considered to be ARARs. CERCLA Section 121(e)(1) (Title 42 *United States Code* Section 9621[e][1]), states that, "No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section." The term "on site" is defined for purposes of this ARARs discussion as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action" (Title 40 CFR Section 300.5).

Nonpromulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful, and are "to be considered". To be considered (Title 40 CFR Section 300.400[g][3]) requirements complement ARARs but do not override them. They are useful for guiding decisions on cleanup goals or methodologies when regulatory standards are not available.

Pursuant to EPA guidance (EPA 1988a), ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific requirements. This classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the Navy has primary responsibility for identifying federal ARARs at former Naval Air Station Moffett Field. Federal ARARs have been identified for Site 27 in this Record of Decision and are discussed in this appendix. Pursuant to the definition of the term "on site" in Title 40 CFR Section 300.5, the following are considered on-site property for this ARARs analysis:

- Northern Channel
- Marriage Road Ditch
- Patrol Road Ditch
- North Patrol Road Ditch
- Debris Pile (the debris pile is located north of the Building 191 lift station at the western end of the Northern Channel)
- Berms (the Cargill and National Aeronautics and Space Administration berms adjacent to Building 191, and the Lockheed Martin Corporation berm near the eastern end of the Northern Channel)

Identification of potential state ARARs was initiated through Navy requests to the San Francisco Bay Regional Water Quality Control Board (Water Board). The state identification process is described in more detail in Section C1.2.3. State ARARs that have been identified for Site 27 are discussed in this appendix.

C1.2 METHODOLOGY DESCRIPTION

This section describes the process of identifying and evaluating federal and state ARARs.

C1.2.1 General

As the lead federal agency, the Navy has primary responsibility for identification of ARARs for the Northern Channel and related areas. In preparing this ARARs analysis, the Navy undertook the following measures, consistent with CERCLA and the NCP:

- Identified federal ARARs for each remedial alternative addressed in the feasibility study report taking into account site-specific information for Site 27
- Reviewed potential state ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met in order to constitute state ARARs
- Evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions
- Reached a conclusion as to which federal and state ARARs are the most stringent and/or "controlling" ARARs for each alternative

As outlined in Section 8.0 of the ROD, the remedial action objective for sediment in the Northern Channel and related areas is as follows:

> Reduce the direct exposure of ecological receptors to total polychlorinated biphenyls (PCB), pesticides (total dichlorodiphenyltrichloroethane and total chlordane), and metals in sediment to levels that are protective of upper-trophic-level receptors in the Northern Channel and related areas. By protecting these receptors, lower-trophic-level receptors such as benthic invertebrates as well as human health also will be protected in the Northern Channel and related areas.

To meet the remedial action objective, the proposed remediation areas comprise any part of the Northern Channel and related areas with concentrations greater than:

- Total Polychlorinated Biphenyls: 0.35 milligrams per kilogram (or 350 micrograms per kilogram)
- Total Dichlorodiphenyltrichloroethane: 0.0648 milligrams per kilogram (or 64.8 micrograms per kilogram)
- Total Chlordane: 0.931 milligrams per kilogram (or 931 micrograms per kilogram)
- Cadmium: 184 milligrams per kilogram
- Lead: 173 milligrams per kilogram
- Mercury: 1.52 milligrams per kilogram
- Selenium: 0.926 milligrams per kilogram
- Silver: 13.7 milligrams per kilogram
- Zinc: 720 milligrams per kilogram

The Navy is addressing total dichlorodiphenyltrichloroethane and total chlordane as part of the selected remedy at Site 27 because these chemicals are the result of runoff from other areas. The concentrations above correspond to protective cleanup goals for upper-trophic-level receptors that were based on birds.

Additionally, residential preliminary remediation goals were identified as cleanup goals for soil in the berms for each chemical below (U.S. Environmental Protection Agencies 2004).

- Total Polychlorinated Biphenyls: 0.22 milligrams per kilogram (or 220 micrograms per kilogram)
- Dichlorodiphenyldichloroethane: 2.4 milligrams per kilogram (or 2,400 micrograms per kilogram); dichlorodiphenyldichloroethene: 1.7 mg/kg (or 1,700 micrograms per kilogram; dichlorodiphenyltrichloroethane: 1.7 mg/kg (or 1,700 micrograms per kilogram)
- Total Chlordane: 1.6 milligrams per kilogram (or 1,600 micrograms per kilogram)
- Cadmium: 37 milligrams per kilogram
- Lead: 150 milligrams per kilogram (California-modified preliminary remediation goal)
- Mercury: 23 milligrams per kilogram
- Selenium: 390 milligrams per kilogram
- Silver: 390 milligrams per kilogram
- Zinc: 23,000 milligrams per kilogram

Six remedial alternatives were developed in the feasibility study report to address potential ecological risks in Site 27 (Tetra Tech EM Inc. 2003). The alternatives included no action, excavation and disposal off site, excavation and ex situ treatment of contaminated sediment, and capping. Ex situ treatment technologies include bioremediation and solidification. The Navy selected excavation and off-site disposal as the remedial action for the Northern Channel and related areas.

C1.2.2 Identifying and Evaluating Federal Applicable or Relevant and Appropriate Requirements

The federal government implements a number of environmental statutes that are the source of potential federal ARARs, either in the form of the statutes themselves or as regulations promulgated thereunder. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act, and their implementing regulations, to name a few. See NCP preamble at Title 55 *Federal Register* 8764–8765 (1990) for a more complete listing.

The proposed remedial alternatives were reviewed against all potential ARARs, including but not limited to those set forth at Title 55 *Federal Register* 8764–8765 (1990), to determine if they were applicable or relevant and appropriate, using CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

C1.2.3 Identifying and Evaluating State Applicable or Relevant and Appropriate Requirements

This section describes the process of identifying and evaluating potential state ARARs by the state and the Navy.

C1.2.3.1 Solicitation of State ARARs under NCP

EPA guidance recommends that the lead federal agency consult with the state when identifying state ARARs for remedial actions (EPA 1988b). In essence, the CERCLA and NCP requirements in Title 40 CFR Section 300.515 for remedial actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs when site characterization is complete. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives that have been retained for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The remainder of this subsection documents the Navy's efforts to date to identify and evaluate state ARARs.

The Navy followed the procedures of the process set forth in Title 40 CFR Section 300.515 and Section 9.6 of the Federal Facility Agreement for remedial actions in seeking state assistance in identifying state ARARs.

C1.2.3.2 Chronology of Efforts to Identify State ARARs

The Navy formally requested state chemical-, location-, and action-specific ARARs for Site 27 in a letter submitted on January 17, 2001. The letter was sent to the Water Board soliciting ARARs based on preliminary remedial technologies and process options considered by the Navy.

On February 28, 2001, the Navy received a response from the Water Board with a list of potential chemical-, location-, and action-specific ARARs that the Water Board believes are applicable or relevant and appropriate. The Navy evaluated the Water Board's response to assess whether any of the laws and regulations cited satisfied the CERCLA and NCP criteria required to be considered state ARARs. The Navy then included any potential state ARARs in the FS. In this Record of Decision, the Navy is selecting the ARARs, including state ARARs, that are appropriate for its remedial action decision. Key correspondence between the Navy and the state agencies relating to this effort is included in the Administrative Record, Appendix A, for this Record of Decision.

C1.3 OTHER GENERAL ISSUES

This section discusses general issues identified during the evaluation of ARARs for the Northern Channel and related areas.

C1.3.1 General Approach to Requirements of the Federal Resource Conservation and Recovery Act

RCRA is a federal statute passed in 1976 to meet four goals: the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. RCRA, as amended, contains several provisions that are potential ARARs for CERCLA sites.

Substantive RCRA requirements are applicable to response actions on CERCLA sites if the waste is an RCRA hazardous waste, and either:

- The waste was initially treated, stored, or disposed of after the effective date of the particular RCRA requirement; or
- The activity at the CERCLA site constitutes treatment, storage, or disposal, as defined by RCRA (EPA 1988a).

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and

potential federal ARARs for the purposes of the ARARs analysis (Title 55 *Federal Register* Sections 8666, 8742 [1990]). The state of California received approval for its base RCRA hazardous waste management program on July 23, 1992 (Title 57 *Federal Register* Section 32726 [1992]). The state of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 *California Code of Regulations* (CCR) Division 4.5, were approved by EPA as a component of the federally authorized state of California RCRA program.

The regulations of Title 22 CCR Division 4.5 are, therefore, a source of potential federal ARARs for CERCLA response actions. The exception is when a state regulation is "broader in scope" than the corresponding federal RCRA regulations. In that case, such regulations are not considered part of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and therefore are potential state ARARs.

The EPA July 23, 1992, notice approving the state of California RCRA program (Title 57 *Federal Reg*ister Section 32726 [1992]) specifically indicated that the state regulations addressed certain non-RCRA, state-regulated hazardous wastes that fell outside the scope of federal RCRA requirements. Title 22 CCR Division 4.5 requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

C1.4 WASTE CHARACTERIZATION

This section describes the selection of ARARs involving characterization of wastes.

C1.4.1 Resource Conservation and Recovery Act Hazardous Waste Determination

A federal RCRA hazardous waste determination is necessary to determine whether RCRA requirements at Title 22 CCR Division 4.5 and other state requirements at Title 23 CCR Division 3, Chapter 15 are applicable. The first step in the RCRA hazardous waste characterization process is to evaluate the contaminated media at the site and determine whether it constitutes a "listed" RCRA waste. The preamble to the NCP states that "…it is often necessary to know the origin of the waste to determine whether it is a listed waste and that, if such documentation is lacking, the lead agency may assume it is not a listed waste" (Title 55 *Federal Register* Section 8666, 8758 [1990]).

This approach is confirmed in EPA guidance for CERCLA compliance with other laws (EPA 1989), as follows:

> "To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many Superfund sites, no information exists on the source of wastes. The lead agency should use available site information, manifests, storage records, and vouchers in an effort to ascertain the nature of these contaminants. When this documentation is not available, the lead agency

> may assume that the wastes are not listed RCRA hazardous wastes, unless further analysis or information becomes available that allows the lead agency to determine that the wastes are listed RCRA hazardous wastes."

Based on the available information, it is not possible to determine the source of the contaminants in the sediment for RCRA-listed waste purposes. Therefore, the Navy has made the determination that the presence of PCBs, pesticides, and metals should not necessarily cause contaminated sediment to be classified as RCRA-listed hazardous wastes. By extension of this reasoning, the residuals generated during treatment of the contaminated sediment will not be classified as RCRA-listed hazardous wastes either.

The second step in the RCRA hazardous waste characterization process is to evaluate potential hazardous characteristics of the waste. The evaluation of characteristic waste is described in EPA guidance as follows (EPA 1988a):

> "Under certain circumstances, although no historical information exists about the waste, it may be possible to identify the waste as RCRA characteristic waste. This is important in the event that (1) remedial alternatives under consideration at the site involve on-site treatment, storage, or disposal, in which case RCRA may be triggered as discussed in this section; or (2) a remedial alternative involves off-site shipment. Since the generator (in this case, the agency or responsible party conducting the Superfund action) is responsible for determining whether the wastes exhibit any of these characteristics (defined in 22 CCR Sections 66261.21–66261.24), testing may be required. The lead agency must use best professional judgment to determine, on a site-specific basis, if testing for hazardous characteristics is necessary.
>
> In determining whether to test for the toxicity characteristic using the extraction procedures (EP) toxicity test, it may be possible to assume that certain low concentrations of waste are not toxic. For example, if the total waste concentration in soil is 20 times or less the EP toxicity concentration, the waste cannot be characteristic hazardous waste. In such a case, RCRA requirements would not be applicable. In other instances, where it appears that the substances may be characteristic hazardous waste (ignitable, corrosive, reactive, or EP toxic), testing should be performed."

Hazardous waste characteristics, as defined in Title 40 CFR Sections 261.21–261.24, are commonly referred to as ignitability, corrosivity, reactivity, and toxicity. California environmental health standards for the management of hazardous waste set forth in Title 22 CCR Division 4.5 were approved by EPA as a component of the federally authorized California RCRA program. Therefore, the characterization of RCRA waste is based on the state requirements.

According to Title 22 CCR Section 66261.10, waste characteristics can be measured by an available standardized test method or be reasonably detected by generators of waste based on their knowledge of the waste. Sediment contamination in the Northern Channel and related areas is not ignitable, corrosive, or reactive, as defined in Title 22 CCR Sections 66261.21–66261.23. This determination was based on knowledge of the nature and concentrations of contaminants and on professional judgment.

The requirements at Title 22 CCR Section 66261.24(a)(1) list the toxic contaminant concentrations that determine the characteristic of toxicity. Sediment excavated from the Northern Channel and related areas will be sampled and analyzed to determine if it is toxic. Therefore, the Navy has selected Title 22 CCR Section 66261.24(a)(1) as an ARAR.

C1.4.2 Toxic Substances Control Act Requirements for Waste Characterization

Sampling and analysis is necessary to determine whether soil and sediment that contains PCBs is subject to the federal Toxic Substances Control Act requirements at Title 40 CFR Section 761.61. Under Section 761.3 of Title 40 CFR "PCB remediation waste" is defined as waste that contains PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: Material disposed of before April 18, 1978, that currently contains a concentration of 50 parts per million (or 50 milligrams per kilogram) PCBs, regardless of the concentration of the original spill; materials that are currently at any volume or concentration where the original source was 500 parts per million (or 500 milligrams per kilogram) of PCBs beginning on April 18, 1978, or 50 parts per million or (50 milligrams per kilogram) beginning on July 2, 1979; and materials that are currently at any concentration if the PCBs are spilled or released from a source that is not authorized for use under this part. PCB remediation waste means soil, rags, and other debris generated as a result of PCB spill cleanup.

The Navy determined that Title 40 CFR Section 761.61(a)(4)(i) is an ARAR. Concentrations of PCBs in excavated sediment will be measured to comply with the substantive requirements of Title 40 Section CFR 761.61(a)(4)(i). Based on TSCA, the cleanup goal for sediment would be 25 milligrams per kilogram because the Northern Channel and related areas are low-occupancy areas. As explained in Section C2, under TSCA 40 CFR 761.61(a)(4)(vi), more stringent cleanup goals may be required based on the proximity to areas such as endangered species habitats, estuaries, and wetlands. Based on the results of the ecological risk assessment conducted for the site, a lower cleanup goal was selected. The cleanup goal is 350 micrograms per kilogram (or 0.35 milligram per kilogram) for total PCBs.

C1.4.3 California-Regulated, Non-Resource Conservation and Recovery Act Hazardous Waste

A waste determined not to be an RCRA hazardous waste may still be considered a state-regulated, non-RCRA hazardous waste. The state is broader in scope in its RCRA program in determining hazardous waste. Title 22 CCR Section 66261.24(a)(2) lists the total threshold limit concentrations and the soluble threshold limit concentrations for non-RCRA hazardous waste. A

waste is considered hazardous if its total concentrations exceed the total threshold limit concentrations or if the extract from the waste extraction test is equal to or greater than the soluble threshold limit concentration. A waste extraction test is required only when the total concentrations exceed the soluble threshold limit concentration but are less than the total threshold limit concentrations (Title 22 CCR Division 4.5, Chapter 11, Appendix II [b]). The Navy determined that Title 22 CCR Section 66261.24(a)(2) is an ARAR. The excavated sediment will be characterized to determine if it is state regulated, non-RCRA hazardous waste.

C1.4.4 Other California Waste Classifications

For waste discharged after July 18, 1997, solid waste classifications at Title 27 CCR Sections 20210, 20220, and 20230 are used to determine the applicability of waste management requirements. These classifications are summarized below.

A "designated waste" under Title 27 CCR Section 20210 is defined at *California Water Code* Section 13173. Under *California Water Code* Section 13173, designated waste is hazardous waste that has been granted a variance from hazardous waste management requirements. Designated waste also may be nonhazardous waste that consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations that would exceed applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state. The Navy determined that Title 27 CCR Section 20210 is an ARAR.

A nonhazardous solid waste under Title 27 CCR Section 20220 is all putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid wastes, and other discarded waste (whether of solid or semisolid consistency) provided that such wastes do not contain wastes that must be managed as hazardous wastes or wastes that contain soluble pollutants in concentrations that exceed applicable water quality objectives or could cause degradation of waters of the state. The Navy determined that Title 27 CCR Section 20220 is an ARAR.

Under Title 27 CCR Section 20230, inert waste is a subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives and does not contain significant quantities of decomposable waste. Sediments from the Northern Channel and related areas that are not identified as hazardous will be characterized using these criteria to identify the appropriate disposal requirements. The Navy determined that Title 27 CCR Section 20230 is an ARAR.

C2 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Chemical-specific applicable or relevant and appropriate requirement (ARAR) are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup goal. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific but include numerical values or methodologies to establish them so they fit in both categories (chemical- and action-specific).

This section presents federal and state chemical-specific ARARs determination conclusions for sediment in the Northern Channel and related areas (Table C-1). Toxic Substances Control Act is the only federal chemical-specific ARAR for sediments. For soil in the berms and debris pile, the Navy and the U.S. Environmental Protection Agency have agreed to use the residential preliminary remediation goal as the cleanup goal for PCBs and other chemicals of ecological concern in soil. There are no state chemical-specific ARARs for polychlorinated biphenyls (PCB) in sediment. However, the Navy has determined that the certain substantive requirements of Chapter 2 of the Water Quality Control Plan (hereinafter referred to as the "Basin Plan") for the San Francisco Bay Regional Water Quality Control Board (1995) are ARARs.

Sediment is the environmental medium potentially affected by the response actions for the Northern Channel and related areas. The conclusions for ARARs pertaining to this medium are presented in the following sections.

SEDIMENT APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Federal

The federal chemical-specific ARARs for PCBs are in regulations adopted pursuant to Toxic Substances Control Act. Toxic Substances Control Act regulates storage and disposal of PCBs. U.S. Environmental Protection Agency designed self-implementing procedures for a general, moderate-size site where residual environmental impact from remedial actions should be low. The requirements at Title 40 *Code of Federal Regulations* (CFR) Section 761.61(a) are not binding for response actions under Comprehensive Environmental Response, Compensation, and Liability Act (Title 40 CFR Section 761.61[a][1][ii]) and are therefore not applicable requirements. However, the substantive cleanup goals at Title 40 CFR Section 761.61(a)(4) may be relevant and appropriate for soil response actions. Under Title 40 CFR Section 761.61(a)(4)(i)(A), the cleanup goal for bulk PCB remediation waste in high-occupancy areas is less than or equal to 1 parts per million (or 1 milligram per kilogram) without further conditions. The cleanup goal for bulk PCB remediation waste in low-occupancy areas is less than or equal to 25 parts per million (or 25 milligrams per kilogram) under Title 40 CFR Section 761.61(a)(4)(i)(B)(1).

TABLE C-1: FEDERAL AND STATE CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirement Determination[a]	Comments
Federal Requirements				
Toxic Substances Control Act (Title 15 *United States Code*, Chapter 53, Sections 2601-2692)				
Regulates storage and disposal of PCBs	Soil, debris, sludge or dredged materials contaminated with PCBs.	PCB remediation waste cleanup standards, Title 40 *Code of Federal Regulations* Section 761.61 (a)(4)(i)	Relevant and Appropriate	The cleanup goal for bulk remediation waste in high occupancy areas is less than or equal to 1 part per million (or 1 milligram per kilogram) without further conditions. The cleanup goal for bulk PCB remediation waste in low-occupancy areas is less than or equal to 25 mg/kg. Under TSCA 40 CFR 761.61(a)(4)(vi), more stringent cleanup goals may be required based on the proximity to areas such as endangered species habitats, estuaries, and wetlands. Based on the results of the ecological risk assessment conducted for this site, a lower cleanup goal was selected. The cleanup goal is 350 micrograms per kilogram (or 0.35 milligram per kilogram) for total PCBs. The Navy and the U.S. Environmental Protection Agency have agreed to use the residential preliminary remediation goal as the cleanup goal for PCBs and other chemicals of ecological concern in soil.
State Requirements				
State and Regional Water Quality Control Boards				
Describes water basins and establishes beneficial uses	Impact to groundwater.	Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) (*Water Code* Section 13240)	Applicable	The substantive requirements of the following provisions of Chapter 2 of the Basin Plan are applicable requirements: "Definitions of Beneficial Uses," "Present and Potential Beneficial Uses, Surface Waters," and "the Santa Clara Valley Basin section of Table 2-9."

Notes:

a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 5.

PCB Polychlorinated biphenyl

Source:

San Francisco Bay Regional Water Quality Control Board. 1995. "Water Quality Control Plan, San Francisco Bay Basin, Region 2." December.

Under Section 761.3 of Title 40 CFR, "PCB remediation waste" is defined as waste that contains PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: materials disposed of before April 18, 1978, that are currently at concentrations of 50 parts per million (or 50 milligrams per kilogram) of PCBs, regardless of the concentration of the original spill; materials that are currently at any volume or concentration where the original source was 500 parts per million of PCBs beginning on April 18, 1978, or 50 parts per million (or 50 milligrams per kilogram) of PCBs beginning on July 2, 1979; and materials that are currently at any concentration if PCBs are spilled or released from a source not authorized for use under this part. PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup. "High occupancy" areas are areas such as residences, schools, and day-care centers where people spend at least 16.8 hours a week. "Low occupancy" areas are areas such as electrical substations or locations in an industrial facility where a worker spends small amounts of time, which is less than 7 hours per week. Although these regulations may not be applicable because current concentrations are less than 50 parts per million (or 50 milligrams per kilogram) and the concentrations of the original spill are unknown, the Navy has nevertheless concluded that these regulations are relevant and appropriate because similar substances are found at the site.

Based on TSCA, the cleanup goal for sediment would be 25 milligrams per kilogram because the Northern Channel and related areas are low-occupancy areas. However, according to TSCA 40 CFR 761.61(a)(4)(vi), more stringent cleanup goals may be required based on the proximity to areas such as endangered species habitats, estuaries, and wetlands. The cleanup goal of 25 parts per million (or 25 milligrams per kilogram) is not sufficiently protective of ecological receptors at Site 27. The feasibility study for Site 27 explains that the identified allowable exposure level range is 350 to 8,610 micrograms per kilogram (or 0.35 to 8.6 milligrams per kilogram) (Tetra Tech EM Inc. 2003). This allowable exposure level range is based on risks to the Black-necked Stilt because it is the most conservative allowable exposure level when comparing the three birds. The site-specific allowable exposure level range of 350 to 8,610 micrograms per kilogram (or 0.35 to 8.6 milligrams per kilogram) is recommended as the remedial action objective range for total Aroclors for the Northern Channel and related areas. Therefore based on the results of the ecological risk assessment, the cleanup goal is 350 micrograms per kilogram (or 0.35 milligram per kilogram) for total PCBs.

State

There is no state chemical-specific ARAR for PCBs. However, PCBs may be regulated as hazardous waste under the Hazardous Waste Control Law. These requirements for characterizing and handling are discussed under the action-specific requirements.

The substantive provisions of the following sections of the Basin Plan are ARARs:

- Definitions of beneficial uses
- Present and potential beneficial uses, surface waters
- The Santa Clara Valley Basin section of Table 2-9 in the Basin Plan

C3 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

This section identifies and discusses the location-specific applicable or relevant and appropriate requirements (ARAR). The discussions are presented based on various attributes of the site location.

Biological resources, coastal resources, hydrological resources, and wetlands protection are the resource categories relating to location-specific requirements potentially affected by the response actions at the Northern Channel and related areas. The conclusions for ARARs pertaining to these resources are presented in the following sections. Table C-2 presents and evaluates federal and state location-specific ARARs for excavation of contaminated sediments.

C3.1 BIOLOGICAL RESOURCES APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Both federal and state laws and regulations prohibit the taking of endangered and threatened plant and animal species and their critical habitat. The Northern Channel and related areas are not critical habitat for endangered or threatened species, as defined in Title 50 *Code of Federal Regulations* (CFR) Part 17, Subpart B, Sections 17.11 and 17.12. Although they have never been observed in the area, both federal and state endangered species may visit (for example, the California brown pelican, American peregrine falcon, and California least tern) or reside (for example, the California clapper rail and salt marsh harvest mouse) within the Northern Channel and related areas.

C3.1.1 Federal

Endangered Species Act of 1973

The Endangered Species Act of 1973 (Title 16 *United State Code* [USC] Sections 1531-1543) provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. The Endangered Species Act defines an endangered species and provides for designation of critical habitats. Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. Under Section 7(a) of the Endangered Species Act, federal agencies must carry out conservation programs for listed species. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented. The requirement of Section 7(a) for federal agencies to assure that the actions they authorize, fund, or carry out, are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy their critical habitat is a substantive requirement with which the Navy will comply. The consultation requirement of 7(a) is an administrative requirement and is, therefore, not an ARAR.

TABLE C-2: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements					
Coastal Zone Management Act (Title 16 USC Section 1451-1464)					
Within coastal zone	Conduct activities in a manner consistent with approved state management programs.	Activities affecting the coastal zone including lands there under and adjacent shore land.	Title 16 USC Section 1456(c) Title 15 CFR Part 930	RA	The remedial action will have some short-term impact on the coastal zone, in general, and marshes, specifically. The affected areas will be restored to their current use.
Endangered Species Act of 1973 (Title 16 USC Sections 1531-1543)					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition an improvement are implemented.	Determination of effect upon endangered or threatened species or its habitat. Critical habitat upon which endangered species or threatened species depend.	Title 16 USC Section 1536(a), (h)(1)(B)	RA	Although no endangered species were identified in the area of the Northern Channel, pickleweed was identified along the slopes of the Northern Channel. The salt marsh harvest mouse, a federal and state endangered and threatened species, may visit the pickleweed in the Northern Channel areas. In addition, the California brown pelican, American peregrine falcon, California least tern, and the California clapper rail may visit the Northern Channel. In accordance with 50 CFR Part 17, Subpart B and Part 226 Subparts B, C, and D, no critical habitat exists in the Northern Channel area.

TABLE C-2: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Migratory Bird Treaty Act of 1972 (Title 16 USC Sections 703–712)					
Migratory bird area	Protects almost all species of native migratory birds in the United States from unregulated "take," which can include poisoning at hazardous waste sites.	Presence of migratory birds.	Title 16 USC Section 703	RA	The substantive portions are relevant and appropriate as migratory birds have been observed at the site.
Rivers and Harbors Act of 1899 (Title 33 USC Sections 401-413)					
Navigable waters	Permits required for structures or work in or affecting navigable waters.	Activities affecting navigable waters.	Title 33 USC Section 403 Title 33 CFR Part 322	RA	The substantive provisions of this requirement are relevant and appropriate requirements for dredging which may affect navigable waters.
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344)					
Wetland	Action to prohibit discharge of dredged of fill material into wetland without permit	Wetland as defined by Executive Order No. 11990 Section 7.	Title 33 USC Section 1344 Title 40 CFR Section 230.10	A	The substantive provisions are applicable for the discharge of dredged or fill material to a wetland.
Executive Order No. 11990, Protection of Wetlands					
Wetland	Action to minimize the destruction, loss, or degradation of wetlands.	Wetland meeting definition of Section 7.	Title 40 CFR Section 6.302(a)	A	The substantive provisions of Title 40 CFR Section 602(a) are applicable requirements for the response action. The Navy will minimize the impacts to wetlands when implementing the response action.

TABLE C-2: FEDERAL AND STATE LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Location	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
State Requirements					
California Endangered Species Act (*California Fish and Game Code* Sections 2050-2116)					
Endangered species habitat	No person shall import, export, take, possess, or sell any endangered or threatened species or par or product thereof.	Threatened or endangered species determination on or before January 1, 1985 or a candidate species with proper notification.	*California Fish and Game Code* Section 2080	RA	Although no endangered species were identified in the area of the Northern Channel, pickleweed was identified along the slopes of the Northern Channel. The salt marsh harvest mouse, a federal and state endangered and threatened species may visit or reside in the pickleweed in the Northern Channel areas.
California Fish and Game Code					
Waters of the state	Prohibits depositing in, permitting to pass into, placing where it can pass into waters of the state petroleum acid, coal or any substance or material deleterious to fish, plant life or bird life.	Deposit of material deleterious to fish, plant or bird life.	*California Fish and Game Code* Section 5650(a)	RA	The substantive provisions of 5650(a) are relevant and appropriate.

Notes:

a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 5.

A Applicable
CFR *Code of Federal Regulations*
RA Relevant and appropriate
USC *United States Code*

The Navy determined that the substantive provisions of the Endangered Species Act contained in Title 16 USC Section 1536(a) and 1536(h)(1)(B) are ARARs for the remedial action for contaminated sediment at the Northern Channel and related areas because the action may directly or indirectly modify the land or water where federal and state endangered species may visit or reside. Although no endangered species were identified in the area of the Northern Channel, pickleweed was identified along the slopes of the Northern Channel. The salt marsh harvest mouse, a federal and state endangered and threatened species, may visit the pickleweed in the Northern Channel areas. In addition, the California brown pelican, American peregrine falcon, California least tern, and the California clapper rail may visit the Northern Channel.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (Title 16 USC Sections 703–712) prohibits at any time, using any means or manner, the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any migratory bird. This act also prohibits the possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds for which this requirement applies is found at Title 50 CFR Section 10.13. It is the Navy's position that this act is not legally applicable to Navy actions; however, Executive Order No. 13186 (dated January 10, 2001) requires each federal agency taking actions that have or are likely to have a measurable effect on migratory bird populations to develop and implement, within 2 years, a memorandum of understanding with the United States Fish and Wildlife Service to promote the conservation of such populations. The Department of Defense and the United States Fish and Wildlife Service are in the process of negotiating this memorandum of understanding. In the meantime, the Migratory Bird Treaty Act will continue to be evaluated as a potentially relevant and appropriate requirement for Navy response actions under the Comprehensive Environmental Response, Compensation, and Liability Act.

The response action will comply with the Migratory Bird Treaty Act.

C3.1.2 State

Only the California Endangered Species Act was identified as a state ARAR. *California Fish and Game Code* Section 2080 (the California Endangered Species Act) prohibits importing, exporting, taking, possessing, or selling of any endangered species. The substantive provisions of Section 2080 are also relevant and appropriate, and the Navy has selected it as an ARAR.

C3.2 COASTAL RESOURCES APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

C3.2.1 Federal

Coastal Zone Management Act

Only the Coastal Zone Management Act was identified as a federal ARAR for coastal resources. The Coastal Zone Management Act (Title 16 USC Section 1451-1464) specifically excludes federal lands from the coastal zone (Title 16 USC Section 1453[1]). Therefore, the Coastal Zone

Management Act is not potentially applicable, but it may be relevant and appropriate. Section 1456(a)(1)(A) requires each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource to conduct its activities in a manner that is consistent to the maximum extent practicable with enforceable policies of approved state management policies. A state coastal zone management program is developed under state law guided by the Coastal Zone Management Act and its accompanying implementing regulations in Title 15 CFR Part 930. A state program sets forth objectives, policies and standards to guide public and private uses of lands and water in the coastal zone.

California's approved coastal management program includes the San Francisco Bay Plan (hereinafter referred to as the "Bay Plan") developed by the San Francisco Bay Conservation and Development Commission (2002). The Bay Conservation and Development Commission was formed under the authority of the McAteer-Petris Act, *California Government Code* Section 66600 et seq. and subsequent sections, which authorizes the Bay Conservation and Development Commission to regulate activities within San Francisco Bay and the shoreline (100 feet landward from the shoreline) in conformity with the policies of the Bay Plan. The McAteer-Petris Act and the Bay Plan were developed primarily to halt uncontrolled development and filling of the bay. Their broad goals include reducing fill and disposal of dredged material in the bay, maintaining marshes and mudflats to the fullest extent possible to conserve wildlife and abate pollution, and protecting the beneficial uses of the bay.

The Navy determined that the Coastal Zone Management Act and its implementing regulation at Title 15 CFR Part 930 are ARARs. The coastal zone will not be permanently altered by the remedial action The affected area will either remain as it is (no action) or will be restored to its current use (excavation and capping alternatives). The selected remedial action will be designed to minimize short-term and temporary effects anticipated for this area.

C3.2.1 State

No state ARARs were identified for coastal resources.

C3.3 HYDROLOGIC RESOURCES APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

C3.3.1 Federal

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 prohibits the creation of any obstruction not authorized by Congress to the navigable capacity of any of the waters of the United States (Title 33 USC Sections 401-413). It prohibits construction of wharves, piers, booms, weirs, breakwaters, bulkheads, jetties, or other structures in a port unless the construction is approved by the U.S. Army Corps of Engineers. In addition, excavation or filling of any port, harbor, channel, lake or any navigable water is prohibited without authorization. Section 10 permits are required for these activities. Section 10 permits cover construction, excavation, or deposition of materials in, over, or under navigable waters, or any work that would affect the course, location,

condition, or capacity of those waters. Implementing regulations for Section 10 permits are codified at Title 33 CFR Part 322. The Navy has selected the substantive provisions of Title 33 USC Section 403 and Title 33 CFR Part 322 as ARARs for excavation of sediment to the extent excavation affects navigable waters.

C3.3.2 State

No state ARARs were identified for hydrologic resources.

C3.4 WETLANDS PROTECTION APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

C3.4.1 Federal

Protection of Wetlands, Executive Order No. 11990

Executive Order No. 11990 requires that federal agencies minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial value of wetlands; and avoid support of new construction in wetlands if a practicable alternative exists.

While Executive Orders themselves are not ARARs, they constitute "to be considered" criteria guidance that should be followed in any response action. Executive Order 11990 is codified at Title 40 CFR Section 6.302(a). The substantive portions of Title 40 CFR Section 6.302(a) are ARARs for response actions within a wetland. Adverse impacts to wetlands will be minimized during the response action.

Clean Water Act (Title 33 USC Section 1344)

Section 404 of the Clean Water Act of 1977 governs the discharge of dredged and fill material into the waters of the United States, including adjacent wetlands. Wetlands are areas that are inundated by water frequently enough to support vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mudflats, natural ponds, and similar areas. Both the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers have jurisdiction over wetlands. U.S Environmental Protection Agency's Section 404 guidelines are promulgated in Title 40 CFR Part 230, and the U.S. Army Corps of Engineer's guidelines are promulgated in Title 33 CFR Part 320.

The Navy has selected the substantive requirements of Title 33 USC Section 1344, Section 404, and the implementing regulations at Title 40 CFR Section 230.10 as ARARs for any dredging or filling of wetlands.

C3.4.2 State

California Fish and Game Code Section 5650(a) states that it is unlawful to deposit in, permit to pass into, or place in to the waters of the state any of the following including, but not limited to, petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum, or carbonaceous material or substance; or any substance or material harmful to fish, plant life, or bird life. The Navy has selected the substantive provisions of this section as ARARs.

C4 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The federal action-specific applicable or relevant and appropriate requirements (ARAR) include Resource Conservation and Recovery Act (RCRA), the Hazardous Materials Transportation Law, the Clean Air Act, the Clean Water Act and Toxic Substances Control Act (TSCA). The state action-specific ARARs include: Title 22 *California Code of Regulations* (CCR) Section 66261.24(a)(2) and Title 27 CCR Sections 20210, 20220 and 20230. Table C-3 presents and evaluates federal and state ARARs for excavation of contaminated sediments.

C4.1 FEDERAL

Resource Conservation and Recovery Act

Waste generated as a result of excavation will be characterized to determine if it is hazardous. The excavated sediment may be classified as a federal hazardous waste, as defined by RCRA and the state-authorized program, or as non-RCRA, state-regulated hazardous waste. If the sediment is deemed hazardous waste, the appropriate requirements will apply.

The federal RCRA requirements at Title 40 *Code of Federal Regulations* (CFR) Part 261 do not apply in California because the state RCRA program is authorized. The authorized state RCRA requirements are therefore considered federal ARARs. The applicability of RCRA requirements depends on whether the waste is a RCRA hazardous waste, whether the waste was initially treated, stored, or disposed of after the effective date of the particular RCRA requirement, and whether the activity at the site constitutes treatment, storage, or disposal as defined by RCRA. However, RCRA requirements may be relevant and appropriate even if they are not applicable. Examples include activities that are similar to the definition of RCRA treatment, storage, or disposal for waste that is similar to RCRA hazardous waste.

The determination of whether a waste is an RCRA hazardous waste can be made by comparing the site waste with the definition of RCRA hazardous waste. The Navy determined that the RCRA requirements at Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are ARARs because they define RCRA hazardous waste. A waste can meet the definition of hazardous waste if it exhibits the toxicity characteristic of hazardous waste. This determination is made by using the toxicity characteristic leaching procedure. The maximum concentrations allowable for the toxicity characteristic leaching procedure listed in Section 66261.24(a)(1)(B) are federal ARARs for determining whether the site has hazardous waste. If concentrations in the site waste exceed these values, it is determined to be a characteristic RCRA hazardous waste.

TABLE C-3: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements					
Resource Conservation and Recovery Act (Title 42 USC, Chapter 82, Sections 6901-6991[i])					
Excavation	Definition of RCRA hazardous waste.	Soil and water	Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1) and 66261.100	A	The requirements of Title 22 CCR, Division 4.5, Chapter 14 are applicable for determining whether excavated material contains hazardous waste. These requirements may also be relevant and appropriate to excavated material that is similar or identical to RCRA hazardous waste or non-RCRA hazardous waste
Hazardous waste accumulation	On-site hazardous waste accumulation is allowed for up to 90 days as long as the waste is stored in containers or tanks, on drip pads, inside buildings, is labeled and dated, etc.	Accumulate hazardous waste	Title 22 CCR Section 66262.34	A	These requirements are applicable if hazardous waste is generated and accumulated on-site before transport.
Land disposal	Requires generators of hazardous waste to determine if waste has to be treated before it can be land disposed. Requires generators to notify treatment facility if a waste is subject to land disposal restrictions and does not meet applicable treatment standards. If the waste meets treatment standards, generators must sign a certification.	Hazardous waste land disposal	Title 22 Sections 66268.1(f), 66268.7	A	These requirements are applicable if hazardous waste is to be land disposed.

TABLE C-3: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Resource Conservation and Recovery Act (Title 42 USC, Chapter 82, Sections 6901-6991[i])					
Pretransport requirements	Hazardous waste must be packaged in accordance with DOT regulations before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.30	A	These requirements are applicable if hazardous waste is to be transported.
	Hazardous waste must be labeled in accordance with DOT regulations before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.31	A	These requirements are applicable if hazardous waste is to be transported.
	Provides requirements for marking hazardous waste before they are transported.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.32	A	These requirements are applicable if hazardous waste is to be transported.
	A generator must ensure that the transport vehicle is correctly placarded prior to transport of hazardous waste.	Any operation where hazardous waste is generated	Title 22 CCR Section 66262.33	A	These requirements are applicable if hazardous waste is to be transported.
	Requires preparation of a manifest for transport of hazardous waste off-site.	Any operation where hazardous waste is generated	Title 22 CCR Sections 66262.20-66262.23	A	These requirements are applicable if hazardous waste is to be transported.

TABLE C-3: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Clean Air Act (Title 42 USC Section 7401 et seq.) (Continued)					
Excavation	Prohibits emissions that are as dark as or darker than No.1 on the Ringelmann Chart and sets forth opacity limitations.	Excavation	BAAQMD Regulations 6, Regulations 6-301 and 6-302	A	These requirements are applicable for excavation.
	Prohibits the emission of particles in sufficient number to cause annoyance.	Release of particles	BAAQMD Regulation 6-305	Applicable	This requirement is applicable for excavation.
	Provides requirements for maintaining, covering and stock-piling excavated soil.	Soil stockpile	BAAQMD Regulation 8, Rule 40	A	These requirements are applicable for excavation.
Federal Hazardous Materials Transportation Law (Title 49 USC Sections 5101-5127)					
Transportation of hazardous material Title 49 USC Sections 5101-5127	Sets forth requirements for transporting hazardous waste including representations that containers are safe, prohibitions on altering labels, marking requirements, labeling requirements and placarding requirements.	Interstate carriers transporting hazardous waste and substance by motor vehicle	Title 49 CFR Sections 171.2(f), 171.2(g), 172.300, 172.301,172.302, 172.303172.304, 172.312, 172.400, 172.504	RA	Relevant and appropriate for transporting hazardous materials on-site.
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344)					
Discharge of water	Establishes the requirements for a National Pollutant Discharge Elimination System permit for discharge to waters of the United States.	Discharge of waster	Title 40 CFR Part 122 Subpart C	RA	Water generated while one section of the Northern Channel is dewatered will be discharged to another section of the channel. The substantive requirement of Title 40 CFR Part 122 Subpart C will be followed in addressing the new point discharge.

TABLE C-3: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
Federal Requirements (Continued)					
Clean Water Act of 1988, as Amended, Section 404 (Title 33 USC Section 1344) (Continued)					
Storm water discharge	Order 99-08-DQW is the State of California general permit for stormwater discharge from construction. It requires use of best management practices to reduce pollutants.	Storm water discharge	State Water Resources Control Board Order 99-08 adopted pursuant to Title 40 CFR Part 122, Subpart C	RA	Order 99-08—DQW applies to excavation activities that affect at least 1 acre. Pursuant to the substantive permit requirements, best management practices will be taken to prevent construction pollutants from contacting stormwater and keep erosions products from moving off site.
Toxic Substances Control Act (15 USC Chapter 53 Sections 2601-2692)					
Disposal of PCBs	Provides options for disposing of PCB remediation waste and requirements to implement each option.	Remedial actions involving PCBs	Title 40 CFR Section 761.61	RA	Excavated sediment containing PCBs may be disposed of in accordance with the requirements of this regulation.
Storage of PCB remediation waste	Establishes requirements for storage of PCB remediation wastes released into the environment.	Storage of PCBs	Title 40 CFR Sections 761.65(c)(4) and (c)(9)	RA	Excavated sediment that contains PCBs may be stored on site up to 180 days. The storage area must have a liner, cover, and runon control system.
Toxic Substances Control Act (Title 15 USC Chapter 53 Sections 2601-2692)					
Decontamination standards for water containing PCBs	Establishes standards for the disposal of water used for decontamination of equipment used in excavation, storage, and treatment of PCB remediation waste.	Decontamination of water	Title 40 CFR Section 761.79(b)(1)	RA	The decontamination standard for PCBs is less than 3 micrograms per liter for water discharges to a publicly owned treatment works or to navigable waters or less than or equal to 0.5 microgram per liter PCBs for unrestricted use.

TABLE C-3: FEDERAL AND STATE ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (CONTINUED)
Record of Decision, Site 27 – Northern Channel, Former Naval Air Station Moffett Field, California

Action	Requirement	Prerequisite	Citation	Applicable or Relevant and Appropriate Requirements Determination[a]	Comments
State Requirements					
Characterization of waste	Definition of "non-RCRA hazardous waste."	Waste.	Title 22 CCR Sections 66261.24(a)(2) and 66261.101	A	Applicable for determining whether a waste is a non-RCRA hazardous waste.
	Contains criteria for characterizing the waste as either designated, nonhazardous, or inert waste.	Designated waste	Title 27 CCR Sections 20210, 20220 and 20230	A	Representative samples of excavated sediment must be tested to identify appropriate disposal requirements.
Stormwater discharge	Establishes the state stormwater permit program and sets forth substantive conditions for construction sites larger than 1 acre.	Stormwater discharge	State Water Resources Control Board Order 99-08 adopted pursuant to Title 40 CFR Part 122, Subpart C	RA	Order 99-08—DQW applies to excavation activities that affect at least 1 acre. Pursuant to the substantive permit requirements, best management practices will be taken to prevent construction pollutants from contacting stormwater and keep erosions products from moving off site.

Notes:

a Indicates whether the requirement is applicable or relevant and appropriate for Alternatives 2 through 4.

BAAQMD Bay Area Air Quality Management District
CCR *California Code of Regulations*
CFR *Code of Federal Regulations*
DOT Department of Transportation
PCB Polychlorinated biphenyl
RCRA Resource Conservation and Recovery Act
USC *United States Code*

RCRA land disposal restrictions at Title 22 CCR Section 66268.1(f) are federal ARARs for discharging waste to land. This section prohibits the disposal of hazardous waste to land unless (1) it is treated in accordance with the treatment standards of Title 22 CCR Section 66268.40 and the underlying hazardous constituents meet the Universal Treatment Standards at Title 22 CCR Section 66268.48; (2) it is treated to meet the alternative soil treatment standards of Title 22 CCR Section 66268.49; or (3) a treatability variance is obtained under Title 22 CCR Section 66268.44. The Navy determined that Title 22 CCR Section 66268.1(f) is an ARAR.

The Navy also determined that Title 22 CCR Section 66268.7 is an ARAR. Before any waste is sent off site, the Navy will determine whether the waste is subject to land disposal restrictions and will provide the required notices and certifications of Section 66268.7.

As long as the excavated material remains inside the area of contamination, it is not newly generated and will not be subject to RCRA generator, treatment, or other waste management requirements. Should excavated material be moved outside the area of contamination, however, the substantive RCRA requirements managing hazardous waste including land disposal restrictions would be applicable.

Any hazardous waste accumulated on site, including waste contained in soil and contaminated groundwater, must comply with the RCRA requirements set forth at Title 22 CCR Section 66262.34. This section permits on-site hazardous waste accumulation for up to 90 days as long as the waste is properly stored and labeled. The Navy determined that the following RCRA requirements are ARARs for hazardous waste sent off site for disposal at a disposal facility: the RCRA pre-transport regulations at Title 22 CCR Sections 66262.30 (packaging), 66262.31 (labeling), 66262.32 (marking) and 66262.33 (placarding) and RCRA manifest requirements at Sections 66262.20, 66262.21, 66252.22, and 66262.23. Transfer of any hazardous substances, pollutants or contaminants to an off-site facility will meet the requirements of Comprehensive Environmental Response, Compensation, and Liability Act Section 121(d)(3)(A) and (B) and Title 40 CFR Section 300.440 (the Comprehensive Environmental Response, Compensation, and Liability Act Off-site Rule).

Hazardous Materials Transportation Law

The regulations under the Hazardous Materials Transportation Law (Title 49 *United States Code* Sections 5101-5127) govern the transport of hazardous materials. The Navy determined that the substantive provisions of Title 49 CFR Sections 171.2(f), 171.2(g), 172.300, 172.301, 172.302, 172.303, 172.304, 172.312, 172.400, and 172.504 are ARARs for this response action. The definition of "person" under these regulations includes offering "hazardous material for transportation in commerce or transporting hazardous material to further a commercial purpose." Based on this definition, these sections are not applicable; however, they are relevant and appropriate for transport of materials.

Clean Air Act

The Navy determined the following Bay Area Air Quality Management District regulations are ARARs for excavation activities:

- Regulation 6-301: Ringelmann No. 1 Limitation (regulating emissions that are as dark as or darker than No. 1 on the Ringelmann Chart)
- Regulation 6-302: Opacity Limitation (prohibiting emissions for a period aggregating more than 3 minutes in any hour an emission equal to or greater than 20 percent opacity)
- Regulation 6-305: Visible Particles (prohibiting the emissions of particles in sufficient number to cause annoyance)
- Regulation 8, Rule 40: Aeration of Contaminated Soil and Removal of Underground Storage Tanks (setting forth standards for maintaining, covering, and stockpiling soil)

Clean Water Act

State Water Resources Control Board Order 99-08 is the state of California General Permit for Discharge of Stormwater Associated with Construction Activities, issued pursuant to Title 40 CFR Part 122 Subpart C. The substantive permit requirements are the use of best management practices to prevent construction pollutants from contacting stormwater and to keep erosion products from moving off site. During excavation, best management practices would be used to prevent construction pollutants from contacting stormwater and to minimize erosional products from moving off site, in accordance with Order 99-08.

Before the channel is excavated, the entire channel would be dewatered from the Lockheed Pump Station into the Moffett Channel. Any groundwater seepage during excavation will also be removed from the channel. The only ARARs that would apply to handling water removed from the channel are the Clean Water Act, National Pollution Discharge Elimination System requirements. The substantive requirements of a National Pollutant Discharge Elimination System permit (Title 40 CFR Part 122 Subpart C) will be followed to discharge the water further downstream in the Northern Channel.

Toxic Substances Control Act

Section 761.61(a)(5)(i)(B)(iii) requires that polychlorinated biphenyl (PCB) remediated waste that contains more than 50 parts per million (or 50 milligrams per kilogram) taken off site must be disposed of in a landfill permitted under Section 3004 of RCRA (referred to as a Title C landfill) or a permitted PCB disposal facility such as an incinerator. Under 40 CFR 761.61(a)(5)(i)(B)(2)(ii), soil contaminated with PCBs at a concentration less than 50 parts per million (or 50 milligrams per kilogram) may be disposed of in a permitted state municipal landfill or a nonhazardous nonmunicipal landfill (Class III). If the concentration of PCBs does not meet any of the criteria for PCB remediation waste and if no contaminant analyzed meets the criteria for hazardous waste or as a state-designated waste, none of the Toxic Substances Control

Act regulations in Title 40 CFR Part 761 or the requirements at CCR Titles 22, 23, or 27 for storage, treatment, and disposal will be applicable.

Excavated sediments that are PCB remediation waste will be managed in accordance with PCB remediation waste storage and disposal requirements and decontamination procedures specified in federal PCB regulations, including Title 40 CFR Sections 761.65(c)(9), 761.61, and 761.79(b)(1), which the Navy determined to be ARARs. The Navy has also determined that Title 40 CFR Sections 761.61(a)(5)(i)(B)(iii) and 761.61(a)(5)(i)(B)(ii), which provide options for disposal of PCB remediation waste, are ARARs. The Navy has determined that Title 40 CFR Section 761.65(c)(4), which establishes the requirements for storage of PCB remediation waste, is an ARAR. The excavated sediment that contains PCBs may be stored on site up to 180 days in a lined storage area. The Navy has selected the decontamination standard of less than 3 micrograms per liter in 40 CFR Section 761.79(b)(1) for waste discharged to a publicly owned treatment work or to navigable waters. The decontamination water either will meet the standard or will be disposed off site.

C4.2 STATE

State RCRA requirements included within the U.S. Environmental Protection Agency-authorized RCRA program for California are considered federal ARARs and are discussed above. When state regulations are either broader in scope or are more stringent than their federal counterparts, they are considered state ARARs. State requirements such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (Title 57 *Federal Register* 60848). Title 22 CCR Division 4.5 requirements that are part of the state-approved RCRA program would be potential state ARARs for non-RCRA, state-regulated hazardous wastes.

The site waste characteristics must be compared with the definition of non-RCRA, state-regulated hazardous waste. The Navy determined that the non-RCRA, state-regulated waste definitions in Title 22 CCR Sections 66261.24(a)(2) and 66261.101 are ARARs for determining whether other RCRA requirements are potential state ARARs. This section lists the total threshold limit concentrations and soluble threshold limit concentrations. The site waste may be compared with these thresholds to determine whether it meets the characteristics for a non-RCRA, state-regulated hazardous waste.

Title 27 CCR Sections 20210, 20220 and 20230 are state definitions for designated waste and nonhazardous waste. The Navy determined that these are ARARs for soil that meets the definitions.

Finally, the Navy determined that the substantive provisions of California stormwater requirements of State Water Resources Control Board Order No. 99-08-DWQ are ARARs.

C5 SUMMARY

Applicable or relevant and appropriate requirements (ARAR) have been identified in the text of this appendix for each medium, for each location, and for the remedial action.

The only federal chemical-specific ARARs identified for the Northern Channel and related areas are the polychlorinated biphenyl (PCB) remediation waste cleanup standards in Title 40 *Code of Federal Regulations* (CFR) 761.61(a)(4)(i). The cleanup goal for bulk remediation waste in high occupancy areas is less than or equal to 1 part per million (or 1 milligram per kilogram) without further conditions and 25 parts per million (or 25 milligrams per kilogram) for low-occupancy areas. However, because the Northern Channel and related areas are ecologically sensitive areas, a lower cleanup goal has been established that exceeds the requirements of Toxic Substances Control Act.

The only state chemical-specific ARARs are the substantive requirements of the "Definitions of Beneficial Uses," "Present and Potential Beneficial Uses, Surface Waters," and "the Santa Clara Valley Basin section of Table 2-9" provisions of Chapter 2 of the Basin Plan (San Francisco Bay Regional Water Quality Control Board 1995).

The evaluation of location-specific ARARs indicates that the Section 307(c) of the Coastal Zone Management Act, Section 7 of the Endangered Species Act, Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, the California Endangered Species Act, and *California Fish and Game Code* Sections 2080 and 5650(a) are ARARs for the Northern Channel and related areas.

The remedial action for the Northern Channel and related areas consists of excavation and off-site disposal of contaminated sediments. For excavation itself, the substantive requirements of Title 40 CFR Part 122 Subpart C; Bay Area Air Quality Management District Regulations 6-301, 6-302, 6-305 and Regulation 8, Rule 40, and State of California Water Resource Control Board Order 99-08-DQW are considered ARARs. For characterization of the sediments, the specific requirements of Title 22 *California Code of Regulations* (CCR), Division 4.5, Chapter 12, Article 1, Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1) and (2) and 66261.100, 66261.101; Title 22 CCR Chapter 27, Sections 20210, 20220, and 20230; and Title 40 CFR Section 761.61 are ARARs. These sections consist of designated waste characterizing requirements and any pertinent PCB characterizing requirements. If excavated sediments are PCB remediation waste, they should be managed in accordance with PCB remediation waste storage and disposal requirements and decontamination procedures specified in federal PCB regulations, including Title 40 CFR Sections 761.65(c)(4) and (9), 761.61, and 761.79(b)(1). For off-site disposal, the substantive requirements of Title 22 CCR Sections 66262.30, 66262.31, and 66262.32 for transportation of hazardous waste apply for packaging, labeling, and marking the waste in accordance with U.S. Department of Transportation regulations before transportation are considered ARARs.

C6 REFERENCES

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EPA. 1988b. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01,-02. EPA/540/G-89/004. October.

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APPENDIX D
RESPONSES TO AGENCY COMMENTS ON THE DRAFT AND DRAFT FINAL RECORD OF DECISION FOR SITE 27 – NORTHERN CHANNEL FORMER NAVAL AIR STATION MOFFETT FIELD, CALIFORNIA

RESPONSES TO AGENCY COMMENTS ON THE DRAFT RECORD OF DECISION FOR SITE 27 – NORTHERN CHANNEL FORMER NAVAL AIR STATION MOFFETT FIELD, CALIFORNIA

This document presents the U.S. Department of the Navy's responses to comments on the "Draft Record of Decision for Site 27 – Northern Channel, Former Naval Air Station Moffett Field," dated October 15, 2004. Comments on the draft record of decision (ROD) were received from Lida Tan of the U.S. Environmental Protection Agency (EPA) on January 24, 2005; from Adriana Constantinescu of the San Francisco Bay Regional Water Quality Control Board (Water Board) on January 11, 2005; from David Harlow of the U.S. Fish and Wildlife Service (USFWS) on November 16, 2004; from Eric Watkins of the National Aeronautics and Space Administration (NASA) Ames Research Center on December 8, 2004; from Libby Lucas, a concerned citizen in the Mountain View area on December 13, 2004; from EOA, Inc., on behalf of the City of Sunnyvale on December 13, 2004; and from Teri Peterson of Cargill via electronic mail on January 17, 2005.

RESPONSES TO COMMENTS FROM EPA

General Comments

1. Comment: **<u>Description of the Selected Remedy</u>: The ROD must include the specific excavation depths in Marriage Ditch, North Patrol Road and the Northern Channel in the description of the selected remedy. These excavation depths were specified and illustrated in Figure 2 of the Site 27 Northern Channel Proposed Plan (May 20, 2004). The same or a similar figure should be included in the ROD. The excavation depths should be specified and discussed in the relevant sections (such as Section 12.0 Selected Remedy) in the ROD.**

Response: Comment noted. The Navy will include a figure (Figure 8) showing minimum excavation depths in the ditches and the Northern Channel, as indicated in the proposed plan, in the draft final ROD. However, excavation may be more economically performed by using a straight grade approach. More detailed information on the excavations depths will be provided in the remedial design for Site 27.

2. Comment: **<u>Complete Description of Contaminants of Concern</u>: Throughout the ROD, discussions on the contaminants of concern focus mainly on PCBs and DDT. There are other contaminants of concern identified at Site 27 such as metals and total chlordane. While PCBs and DDT are the major risk drivers at Site 27, the metals also contribute substantially to the overall risk at the site and should be discussed in more detail in Section 5.7, Nature of Contamination.**

Response: The Navy will present concentrations of metals exceeding the cleanup goals on the appropriate figures and discuss the concentrations in Section 5.7 of the draft final ROD.

3. Comment: **<u>The Final Selected Remedy</u>: Some sections (Declaration, Section 7.0) of the ROD discuss sediment contamination only, while other sections (Section 5.7, Figure 5, Section 9.0 and Section 12.0) also include contaminated soil in the discussions. Since the final selected remedy includes remediation of both contaminated soil and sediment, the ROD should clarify that the established cleanup levels are applicable to both contaminated soil and sediment at Site 27.**

Response: The Navy will revise the Declaration and Section 7.4 of the draft final ROD to explain that sediment cleanup goals were used to assess chemical concentrations detected in the debris pile and residential preliminary remediation goals were used to assess chemical concentrations detected in the berms. The use of these cleanup goals to evaluate the debris pile and berm soil concentrations was developed in cooperation with the regulatory agencies. The sediment cleanup goals were used in the feasibility study to assess whether chemical concentrations in soil from the debris pile and berms were similar to chemical concentrations in sediments from the Northern Channel. This comparison was done to evaluate whether the debris pile and berms were constructed with sediment dredged from the Northern Channel.

Subsequent to the draft ROD, the Navy and EPA had discussions on the berms and agreed to (1) continue using the sediment cleanup goals for the soil in the debris pile because dredged sediments were placed there and (2) use the residential preliminary remediation goals for soil from the berms.

4. Comment: **<u>Action Levels vs. Cleanup Goals</u>: The ROD seems to use "action levels" and "cleanup goals" interchangeably while "action levels" appears much more often in the text than "cleanup goals". In order to be consistent with previous documents, particularly the Site 27 Proposed Plan, the ROD should replace "action levels" with "cleanup goals".**

Response: The Navy will use the term "cleanup goal" when discussing concentrations to be achieved by the selected remedy at Site 27. The Navy agrees with using the term "cleanup goal" in the ROD and will revise the text accordingly.

5. Comment: **<u>Recent Soil Sampling Results</u>: The ROD should include a summary of the recent soil sampling results from the Southern Berm in Section 5.7 Nature and Extent of Contamination and either revise**

Figure 5, Berm Transect Locations or include a separate Figure with all the soil sample locations on the Southern Berm. Recommendation for remediation on the Southern Berm should be consistent with remediation criteria used for the Northern Berm.

Response: The Navy will include a discussion of the new Lockheed berm data (referred to as the Southern berm by the reviewer) in the draft final ROD. The Navy will include a figure (Attachment 1, Figure 1) showing the Lockheed berm sampling locations in the draft final ROD.

Subsequent to the draft ROD, the Navy and EPA had discussions on the berms and agreed to (1) continue using the sediment cleanup goals for the soil in the debris pile because dredged sediments were placed there and (2) use the residential preliminary remediation goals for soil from the berms.

Specific Comments

1. Comment: **<u>Page viii, Description of the Selected Remedy</u>:**

a. Please specify the excavation depths following the list of cleanup goals for the contaminant of concerns.

b. Please clarify whether backfilling is only for the debris pile and berm area or all areas of excavation.

Response: a. The Navy will include a figure (Figure 8) showing minimum excavation depths in the ditches and the Northern Channel, as indicated in the proposed plan, in the draft final ROD. More detailed information on the excavations depths will be provided in the remedial design for Site 27.

b. The Navy will revise the draft final ROD to clarify that backfilling is only planned for berms. In order to maintain the hydrologic characteristics of the channel, the clay will be graded or backfilled to maintain flow to the east.

2. Comment: **<u>Page x, Authorizing Signatures</u>: Please update the authoring signature names for Kathleen Johnson for EPA and Bruce Wolfe for the San Francisco Regional Water Board.**

Response: Comment noted. The signature blocks will be changed.

3. Comment: **<u>Page 5, Section 1.6. Site Description</u>: The fourth sentence in the "North Patrol Road Ditch" bullet should be revised to read "Surface water flow through the North Patrol Road Ditch is intermittent..."**

Response: Comment noted. The fourth sentence will be revised.

4. Comment: **<u>Page 11, Fifth Bullet</u>: Replace the letter 'L" after 6 with a semicolon.**

Response: Comment noted. The letter "L" will be replaced with a semicolon.

5. Comment: **<u>Page- 15, Section 5.5 Ecology, last paragraph</u>: Like the western pond turtle, burrowing owl is a California protected species and should be identified as such in the ROD.**

Response: Comment noted. Section 5.5 of the draft final ROD will be revised to identify the burrowing owl as a "California species of special concern."

6. Comment: **<u>Page 16, Section 5.7. Nature and Extent of Contamination</u>:**

a. The first paragraph in this section is irrelevant and should be deleted.

b. Figure 3 is missing. Please add.

c. Please provide the source of the statement in the second paragraph that concentrations of metals in the Northern Channel sediment are found to be similar to concentration in other sediment that receive urban runoff.

Response: a. Comment noted. The Navy will delete the paragraph.

b. A copy of Figure 3 was sent to the EPA on January 24, 2005.

c. The Navy will revise the second paragraph of Section 5.7 to clarify that the source of metals is likely from nonpoint source pollution. Stormwater from urban areas adjacent to and from areas within the former Naval Air Station (NAS) Moffett Field is a source of nonpoint source pollution because the Northern Channel has historically been flooded by bay water from the Moffett Channel and the former Cargill Salt evaporation ponds when heavy rainfall coincides with high tidal events (spring tides).

7. Comment: **<u>Page 18. Section 5.7.1 Sampling Strategy</u>:**

a. When the text makes reference to Figures 4, 5 and. 6, please include the metals, in addition to PCBs and DDT (see Comment #8 below).

b. Please delete the statement in the second paragraph that analysis of the samples taken on the Southern Berm reaffirmed the appropriateness of the preferred alternative from the proposed plan. Instead, the ROD should include a discussion on soil

sampling on the Southern Berm, similar to the discussion of the soil sampling on the Northern Berm.

c. Please delete the last two sentences in the third paragraph, as they are redundant with the first sentence in the fourth paragraph.

d. Please add "surface" in front of "water sample" in the first sentence of the fourth paragraph.

Response: a. The Navy will include metals concentrations exceeding the cleanup goals on the figures in the draft final ROD.

b. Comment noted. The statement will be deleted and a discussion of the new Lockheed berm data (referred to as the Southern berm by the reviewer) will be included in the draft final ROD.

c. The Navy will revise the paragraphs to more clearly describe the sampling locations and analyses for each media collected.

d. Comment noted. The "surface" will be added before "water sample."

8. Comment: **<u>Page 19 - Page 22, Figures 4, 5, 6, and 7</u>: These figures should be revised to include all contaminants of concerns, in addition to PCBs and DDT. Figure 5 should also include the recent sample results collected from the Southern Berm.**

Response: The Navy will revise the draft final ROD to include a discussion and figures with concentrations of chemicals of ecological concern exceeding cleanup goals. The Navy will include a figure (Attachment 1, Figure 1) showing the Lockheed berm sampling locations in the draft final ROD. In addition, Figure 5 will be revised as necessary based on the Lockheed berm sample results.

9. Comment: **<u>Page 23, Section 5.7.2 Summary of Chemical Concentrations</u>:**

a. Please delete the second sentence in the first paragraph as it is not relevant in the discussion.

b. This section should discuss all chemical concentrations comprehensively, rather than focusing on the primary risk drivers, PCBs and DDT. Please revise.

c. The last paragraph on this page discusses soil sampling results and compares them with the established cleanup levels. Please refer to General Comment #3 and revise the text accordingly.

Response: a. The second sentence of the first paragraph will be revised to clarify the process for evaluating data collected during the data gaps investigation. The text in Section 5.7.2 presents a summary of the data evaluation, which included comparing chemical concentrations with cleanup goals.

b. The Navy will revise Section 5.7.2 of the draft final ROD to include a discussion on chlordanes and metals.

c. The Navy will revise this paragraph as suggested in EPA General Comment 3.

10. Comment: **<u>Page 27, Section 7.1 Human Health Risk Assessment</u>: This section should discuss the actual human health risk assessment rather than making a generalized statement that risks associated with the existing *[contamination]* was found to be within or below the cancer risk range of 10^{-4} to 10^{-6}.**

Response: The Navy will revise Section 7.1 to present the quantitative results of the human health risk assessment presented in the "Final Station-Wide Remedial Investigation Report" (PRC Environmental Management, Inc. 1996). However, human health is not a concern because by protecting ecological receptors risk to human health will be further reduced by the remedy.

11. Comment: **<u>Page 28, Section 7.2.2 Summary of Sediment Evaluation</u>:**

a. Please replace the more technical terms such as "higher-trophic-level receptors" and "avian receptors" with "birds" as it can be confusing when the three terms are used interchangeably.

b. The distinction between "action levels" and "allowable exposure levels" is unclear. While Section 7.3.4 provides some clarification between the terms, this section and Section 7.3.5 seems to use these two phrases interchangeably. The phrase "allowable exposure levels" should be limited to Section 7.3.4 Allowable Exposure Levels Based on Risk Assessment. Please replace the term with "cleanup goals" in other sections.

c. Please delete the statement that "by protecting higher-trophic-level receptors, the allowable exposure levels should indirectly provide protection for the benthic fauna..." as this statement is not technically accurate. Similarly, the same statement should be deleted from Section 8.0, Remedial Action Objectives.

Response: a. Comment noted. The terminology will be revised to "birds."

b. The Navy will revise the draft final ROD to consistently use "cleanup goal" instead of action level. The term "allowable exposure level" will only be used in Sections 7.2.2, 7.3.4, and 7.3.5 when referring to sediment concentrations derived from the ecological risk assessment during the feasibility study.

c. Comment noted. The sentence will be deleted, including from Section 8.0. The Navy will revise the draft final ROD to refer to the

decision made while preparing the feasibility study to develop cleanup goals for birds.

12. Comment: **<u>Page 34, Section 7.4 Summary of Action Levels</u>: The section should include the spatial and vertical extent of the excavation areas as the cleanup goals established for Site 27 not only include numeric levels for the chemicals of concern but also the extent of the excavation.**

Response: The Navy will add a figure (Figure 8) to the draft final ROD that shows the spatial and vertical extent of the excavation areas. The excavation may be more economically performed by using a straight grade approach. Please also see the response to EPA General Comment 1.

13. Comment: **<u>Page 35, Section 8.0 Remedial Action Objectives</u>: In order to be consistent with the remedial action objectives presented in the Final Proposed Plan, this section should include the numeric cleanup goals and the extent of excavation. Another option is to make reference to these cleanup goals.**

Response: The Navy will revise Section 8.0 of the draft final ROD to include the cleanup goals and the extent of the excavation.

14. Comment: **<u>Page 36-41, Section 8.0 Remedial Action Objectives, ARAR Tables</u>: These ARAR tables seem to be out of place and redundant with Appendix C. Since Appendix C contains the comprehensive analysis on ARARs for this ROD, this section should make reference to the appendix, rather than referring to these tables.**

Response: The Navy discussed this comment with EPA and it was agreed that the applicable or relevant and appropriate requirements (ARAR) tables from Appendix C should be included in Section 8.0. The ARAR tables will continue to be included in Appendix C.

15. Comment: **<u>Page 42, Section 9.0 Description of Remedial Alternatives</u>: The last two bullets describing Alternatives 4A and 4B should be revised to remove the five-year review requirement from the description of the alternatives since five-year review is a statutory requirement, not a remedy component.**

Response: The Navy will remove the five-year review requirement from the bulleted description of Alternatives 4A and 4B in Section 9.0 of the draft final ROD. The discussion of the five-year requirement will be presented in Sections 9.2.5, 9.3.6, and 9.4.5.

16. Comment: **<u>Page 44, Section 9.2 Alternative 2: Excavation and Off-Site Disposal</u>:**

a. Please replace the subtitle from "Preferred Alternative" to "Selected Remedy".

b. Please make reference to Appendix C ARARs in the fourth bullet.

c. Five-Year Review: it should clarify that a five-year review would not be required under Alternative 2 because no hazardous substances, pollutants, or contaminants would be left in place above levels that would not allow for unlimited land use and unrestricted exposure. This also applies to Section 9.3.6, Five-year review requirements under Alternatives 3A and 3B. Similarly, Section 9.4.4 should be revised to clarify that five-year reviews would be required under Alternatives 4A and 4B as a statutory requirement, because hazardous substances, pollutants, or Contaminants would be left in place above levels that would prevent the unlimited land use and unrestricted exposure.

Response: a. The Navy will revise the subtitle to "Selected Remedy."

b. The tables from Appendix C will be included in Section 8.0, and the text will be revised to refer to Appendix C for a more detailed discussion of ARARs.

c. The Navy will revise the text and the need for a five-year review will be explained, as applicable to the alternative.

17. Comment: **<u>Page 47, Section 9.3.2, First Paragraph</u>: There are very few organisms which will "eat" PCBs and DDTs. This statement should be deleted since it is in contradiction with Section 10.6 where it is said that bioremediation is not a proven technology for PCBs and pesticides.**

Response: The Navy was describing the theoretical process of bioremediation and understands the need to clarify that this technology has not been completely proven. The sentence "These organisms 'eat' polychlorinated biphenyls and dichlorodiphenyltrichloroethane and would reduce their concentrations" will be revised as follows: "Although these organisms have the potential to metabolize polychlorinated biphenyls and dichlorodiphenyltrichloroethane, it has not been proven that these organisms can reduce concentrations of these chemicals to below cleanup goals."

18. Comment: **<u>Page 59, Section 11.0, Principle Threat Waste</u>: While contamination at Site 27 is not considered principle threat waste according to Section 6.3.11 Principle Threat Waste in EPA guidance "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other**

Remedy Selection Decision Document" (1999) and Highlight 2, Examples of Source and Non- Source Material in EPA's "A Guide to Principle Threat and Low Level Treat Wastes" (1991), the contaminated sediment is considered a source material and constitutes as low level threat waste and should be stated so in this section.

Response: The Navy will revise Section 11.0 to identify that contaminated sediment is a low-level threat waste.

19. Comment: **<u>Page 60, Section 12.2 Description of Selected Remedy</u>: The section should make a bullet list of the major components of the selected remedy.**

Response: Comment noted. The major components of the selected remedy will be identified in a bulleted list.

20. Comment: **<u>Page 61, Section 12.3 Summary of Costs for Selected Remedy</u>: This section should state the total cost of the selected remedy in addition to making a reference to Table 7 about the detailed cost estimate.**

Response: The Navy will revise the first sentence of Section 12.3 to read: "Table 7 summarizes the estimated costs for the selected remedy."

21. Comment: **<u>Page 62, Table 7, Detailed Cost Estimate of Alternative 2</u>: The title of the table should be revised to Detailed Cost Estimate of the Selected Remedy.**

Response: Comment noted. The Navy will revise the title of Table 7.

22. Comment: **<u>Page A-3, Appendix A, Administrative Record for Site 27</u>: For the listing of the Final Northern Channel Feasibility Study dated 1-6-2004, please delete the following "includes SWDIV Transmittal Letter by A. Espinoza with Confidential Distribution List". Also, please replace the current wordings under Keyword on the same document with "FS".**

Response: Comment noted. The Navy will revise Appendix A.

23. Comment: **<u>Page A-4, Appendix A, Administrative Record for Site 27</u>: The appendix should include the Federal Facility Agreement (FFA) and the most recent FFA schedule for Site 27.**

Response: The Navy will add these two documents to the Administrative Record.

Specific Comments on Appendix C, Applicable or Relevant and Appropriate Requirements for the Northern Channel and Related Areas

1. **Comment:** **<u>Page C-10, Section C1.4.2</u>: In the discussion of PCB remediation waste, the Navy has selected as an ARAR the PCB regulations applicable to bulk waste in a low-occupancy area. 40 CFR 761.61(a)(4)(i). Section C2, on page C-14, explains how the Navy arrived at this conclusion. Please move the explanation from later in the document to this section to clarify.**

   Response: Comment noted. The Navy will revise Section C1.4.2 to include the explanation of how this requirement will be applied.

2. **Comment:** **<u>Pages C-10-11, Section C1.4.4</u>: This section identifies 27 CCR §§ 20210-20230 as ARARs for the determination of the applicability of waste management requirements to solid wastes. These regulations also set forth the applicable waste management requirements themselves. Please clarify that, following classification, the applicable requirements will be used for disposal of the subject waste.**

   Response: Comment noted. The Navy will revise Section C1.4.4.

3. **Comment:** **<u>Page C-14, Section C2</u>: The action level selected for total PCBs, based on ecological risk, is 350 micrograms per kilogram. Thus, the ARAR for total PCBs is this risk-based number, not the 25 milligrams per kilogram as derived from 40 CFR 761.61 (a)(4)(i). Please clarify.**

   Response: Although Toxic Substances Control Act (TSCA) Title 40 *Code of Federal Regulations* (40 CFR) 761.61(a)(4)(i) is an ARAR, 25 milligrams per kilogram (or 25 parts per million) is not fully protective of ecological receptors at the site. According to TSCA 40 CFR 761.61(a)(4) (vi), more stringent cleanup goals may be required based on the proximity to areas such as endangered species habitats, estuaries, and wetlands. Therefore, a more stringent risk-based cleanup goal of 0.35 milligram per kilogram (or 0.35 parts per million) was developed for sediments at Site 27. The Navy will revise Section C2 of the ROD to explain the applicability of the TSCA ARAR at Site 27.

4. **Comment:** **<u>Page C-13, Table C-1</u>:**

   a. **Please clarify the appropriate ARAR in light of previous comment.**

   b. **This Table does not reflect the ARARs selected in the text of Section C 1, including:**

- **Solid waste classification and management, 27 CCR 20210-20230;**
- **Toxicity testing criteria, 22 CCR 66261.24(a)(1);and**
- **Total threshold limit concentrations and soluble threshold limit concentrations for non-RCRA hazardous waste, 22 CCR 66261.24(a)(2).**

Response: a. The Navy will revise Table C-1 to explain that a risk-based cleanup goal was identified for Site 27.

b. Title 27 *California Code of Regulations* (CCR) Sections 20210-20230 and 22 CCR Sections 66261.24(a)(1) and (2) are identified as action-specific ARARs (see Table C-3), instead of chemical-specific ARARs.

5. Comment: **<u>Page C-15, Section C3.1.1</u>: Because there is potential habitat and thus potential residence or migration of certain endangered and threatened species in the Northern Channel area, the ROD identifies the Endangered Species Act of 1973 (ESA) as an ARAR. Thus, the Navy has asserted that it will comply with the substantive requirement to assure that the actions taken are not likely to jeopardize the continued existence of these species or to adversely modify or destroy their critical habitat. However, because it is identified as an administrative requirement, the Navy has not selected as an ARAR the consultation requirement of Section 7(a) of the ESA. Please clarify what informal consultation will occur in order to assure that the actions taken will not jeopardize the species' continued existence or adversely impact their habitat.**

Response: The Navy acknowledges that it is must still comply with the substantive requirement of the Endangered Species Act (ESA). NASA has stated they will fulfill this requirement as part of the remedial design phase of the Site 27 remedial action. NASA is coordinating directly with USFWS on behalf of the Site 27 remedial action and submitted a Section 7 consultation letter on January 10, 2005. To comply with the Section 7 consultation letter, NASA will conduct a survey of California clapper rails. The Navy will modify Sections 9.2.1, 9.3.1, and 9.4.1 of the draft final ROD to identify that NASA is conducting appropriate biological surveys in consultation with USFWS and California Fish and Game. The Navy will continue to work with NASA's biologist to ensure that species of concern are adequately protected during the remedial action.

6. Comment: **<u>Page C-15 and C-19, Section C3.1.1, Endangered Species Act of 1973</u>: In Table (2-2, on page C -16, it is noted that pickleweed has been identified on the slopes of the Northern Channel. Accordingly the Navy surmises that several endangered or threatened species**

may visit the Northern Channel. This relationship should be reflected and further discussed in the text of Section C3.1.1 regarding the ESA.

Response: Comment noted.

7. Comment: **<u>Page C-20, Table C-2 and Section C3.2</u>: It is explained on page C-20 that the Coastal Zone Management Act Section 1456(a)(1)(A) requires each federal agency activity affecting any land or water use or natural resource to conduct its activities in a manner consistent to the maximum extent practicable with enforceable policies of approved state management policies. The text further explains that the Bay Plan and the McAteer-Petris Act, California Government Cost Sections 66600 et seq. sets forth the goals and policies to follow pursuant to the Coastal Zone Management Act. Thus, the Bay Plan and the McAteer-Petris Act should be identified as state ARARs. Additionally, the discussion on the Coastal Zone Management Act in the Table C2-2, on page C-16, does not set forth the requirements of the approved state management programs with which the actions in the coastal zone must comply. Please expand on what those requirements are.**

Response: The Navy does not plan to include the McAteer-Petris Act and the San Francisco Bay Plan (Bay Plan) as ARARs. The McAteer-Petris Act adopts the Bay Plan but it is not an ARAR itself because it does not set forth any substantive requirements on behalf of the Navy. Rather, it sets forth obligations for the Bay Conservation and Development Commission to implement the Bay Plan. Although the Navy does not plan to identify the Bay Plan as an ARAR, it will comply with the substantive provisions of the ARAR sections when implementing the remedial action. The Bay Plan's purpose is to protect the Bay from needless and gradual destruction. The Navy will expand the text to summarize the relevant requirements of the Bay Plan, which include (1) protecting the Bay as a natural resource for the benefit of present and future generations and (2) limiting filling of the Bay.

8. Comment: **<u>Page C-16, Table C-2</u>: The table identifies Section 1536(h)(l)(B) of the ESA as an ARAR. This section provides for a grant of exemption from the ESA prohibition on taking of endangered or threatened species following the favorable review of an exemption application**

pursuant to section 1536(g). The exemption is determined by the Endangered Species Committee after establishment that reasonable mitigation and enhancement measures as are necessary and appropriate to minimize adverse effects of agency action on the endangered species, threatened species or critical habitat concerned are employed. Although the exemption application procedures of subsection (g) are procedural, the exemption grant of subsection (h)(l)(B) must follow a determination by the Committee or the equivalent thereof that the mitigation and enhancement measures are being used. Please explain how the grant of exemption will be conducted.

Response: The Navy acknowledges that it must comply with the substantive requirements of the ESA. NASA has stated they will fulfill this requirement and comply with the ESA as part of the remedial design phase of the Site 27 remedial action. The Navy will modify Sections 9.2.1, 9.3.1, and 9.4.1 of the draft final ROD to identify that NASA is conducting appropriate biological surveys in consultation with USFWS and California Fish and Game. The Navy will continue to work with NASA's biologist to ensure that species of concern are adequately protected during the remedial action.

9. Comment: **<u>Page C-17, Table C-2</u>: Executive Order 11990 requires the avoidance of impact or the minimization thereof in any action taking place in wetlands. The implementing regulations require a Wetlands Assessment in order to determine: how to avoid or at a minimum minimize impact on the wetlands. Although production of a Wetlands Assessment could be considered an administrative function, the substantive analysis set forth in a Wetlands Assessment would be the basis for determination that impacts have been avoided or appropriately minimized. Without such an Assessment, clarify the way that the Navy will ensure avoidance or minimization of impacts on the wetlands during this action.**

Response: The Navy will modify Sections 9.2.1, 9.3.1, and 9.4.1 of the draft final ROD to clarify that the remedial design will identify appropriate measures to avoid or minimize impacts on the wetlands during the remedial action. A wetlands delineation was conducted (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995). NASA currently manages the Northern Channel and related areas; therefore, NASA has stated they will be responsible for natural resources compliance issues regarding the Site 27 remedial action. The Navy is working closely with NASA's biologists on all natural resource issues for Site 27.

10. Comment: **<u>Page C-18, Table C2-2</u>: The substantive provisions of the California Fish and Game Code Section 5650 is selected as an ARAR. Please explain what those requirements are.**

Response: The Navy will revise Table C-2 as noted. Section 5650(a) contains the only substantive requirements and states:

"It is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state any of the following:

1. Any petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum, or carbonaceous material or substance.
2. Any refuse, liquid or solid, from any refinery, gas house, tannery, distillery, chemical works, mill, or factory of any kind.
3. Any sawdust, shavings, slabs, or edgings.
4. Any factory refuse, lime, or slag.
5. Any cocculus indicus.
6. Any substance or material deleterious to fish, plant life, or bird life."

The Navy will comply with the substantive requirement of Section 5650(a). Section 5650(b) contains exceptions to 5650(a) and is not expected to be an ARAR. Sections 5650(c)-(f) contain provisions relating to affirmative defenses to a violation of Section 5650(a), and these sections are not ARARs.

11. Comment: **<u>Page C-17, Table C-2 and Page 19, Section C3.1.1, Migratory Bird Treaty Act of 1972 and Executive Order 13186</u>: The Navy explains that it is in the process of negotiating a memorandum of understanding (MOU) with U.S. Fish and Wildlife as required by Executive Order number 13186 (January 10, 2001). Please describe the requirements that are anticipated in the MOU.**

Response: The memorandum of understanding between the Department of Defense (DOD) and the U.S. Fish and Wildlife Service pertains to the Migratory Bird Treaty Act. Due to the length of time to negotiate a memorandum of understanding, and because it is a program- not site-specific agreement, Appendix C has not been revised.

12. Comment: **<u>Page C-21, Section C3.4.1</u>: It is explained that 40 CFR § 6.302(a) requires avoidance to the extent possible, and where not entirely possible, minimization of adverse impacts resulting in loss of wetlands or construction within wetlands. In order to accomplish this, the regulations require a floodplains/wetlands assessment to be conducted by the responsible official prior to the activity. Please explain how the Navy intends to assure substantively that this action will have no or minimal impacts on wetlands, without conducting a floodplain/wetlands assessment.**

Response: The Navy recognizes the potential for some short-term loss of wetland habitat and will develop an approach to minimize impacts to the wetlands as part of the remedial design. A wetland delineation was conducted to fulfill the substantive requirements of the wetlands assessment and the wetland remaining after the remedial action will be at least the area delineated (PRC Environmental Management, Inc. and Montgomery Watson, Inc. 1995).

13. Comment: **<u>Page C-26, Table C3</u>: Please consider including TSCA Subpart N, 40 CFR 761.260 et seq., as an ARAR which sets forth the appropriate methodology for new data collection and for assessment of existing data to characterize a PCB remediation waste cleanup site.**

Response: The Navy has evaluated 40 CFR 761.260 et seq. to determine if these sections should be included as ARARs. 40 CFR 761.260 et seq. provides "a method for collecting new data for characterizing a PCB remediation waste cleanup site or for assessing the sufficiency of existing site characterization data as required by Section 761.61(a)(2)." At Site 27, the Navy conducted confirmation sampling and evaluated the site in accordance with Comprehensive Environmental Response, Compensation, and Liability Act requirements. The Navy does not believe confirmation sampling requirements of the Toxic Substances Control Act are ARARs for this site.

14. Comment: **<u>Page C-27, Table C3</u>: State Requirements for Characterization of Waste: 22 CCR 66261.101 should be included as an ARAR for determination of'"non-RCRA hazardous waste." Also, please include State Storm Water Discharge Requirements Order Citation.**

Response: The Navy will revise Table C-3, as requested.

15. Comment: **<u>Page C-28, Section C4.2</u>: 22 CCR § 66262.34 is identified as an ARAR in Table C-3 on page C-23. Please insert this ARAR appropriately into the text of Section C4.2.**

Response: The ROD discusses Section 66264.34 on page C-28, which is the appropriate place for this discussion.

16. Comment: **<u>Page C-28, Section C4.2</u>: Certain sub-sections of 49 CFR §§ 171.1 and 171.2 have been identified as ARARs. In addition to these identified sections, the selected remedy should also comply with the substantive provisions of 49 CFR 171.2(e) [proper classification, description, packaging, marking and labeling of hazardous material for shipment]; 171.2(h); 171.2(i)-(m); § 172.332 [numerical marking requirements for identification]. Please add these sections as ARARs.**

Response: The Navy considers 49 CFR §§ 171.1 and 171.2 to be ARARs.

17. Comment: **<u>Tables C-1, C-2 and C-3</u>: Please make the Comments column consistent with the ARAR Determination column (for example, the Comment column in Table C-1 for the Basin Plan Water Code Section 13240 should be consistent with the ARAR determination, identifying the substantive requirements as applicable, and not relevant and appropriate.**

Response: Comment noted. The Navy will examine the tables for inconsistencies.

RESPONSES TO COMMENTS FROM THE WATER BOARD

Specific Comments

1. Comment: **Section: *Declaration Statement for Site 27 – Northern Channel: Description of the Selected Remedy***

- **In this section please specify that the selected remedy will be also protective to the human health. At Site 27, human health risks associated with existing contamination were found to be within or below the cancer risk range of 10^{-4} to 10^{-6} that EPA considers generally acceptable. The hazard index for this site was less than 1 for noncancer risks.**
- **Under the header "major components of the selected remedy", the third bullet states: "restoring the site by backfilling the excavated areas with clean soil (free from contaminants) and sediment and revegetating the excavated and disturbed areas with plants native to California." Please check if this statement is consistent with the description of the selected remedy presented in the Feasibility Study and, if backfilling will be performed, please specify in what areas of the Site 27.**

Response: The Navy will revise the Declaration Statement to specify that the selected remedy will also be protective of human health.

The Navy will revise the draft final ROD to clarify that only the berms will be revegetated as part of the site restoration activities. The final feasibility study report did not specifically describe how Site 27 will be backfilled and revegetated (Tetra Tech EM Inc. 2003); however, the detailed cost estimates presented in Appendix E include costs associated with "Site Restoration." Specific costs associated with "Backfilling and Revegetation Activities" presented in Appendix E include backfill material, backfilling, compaction, shoring design, final grading, and hydroseeding. In order to maintain the hydrologic characteristics of the channel, the clay will be graded or backfilled to maintain flow to the east. The remedial design will provide the detailed plans for the construction activities.

2. Comment: **Section: *Declaration Statement for Site 27 – Northern Channel: Statutory Determination***

Please discuss in this section the applicability of the five-year review requirements.

Response: The Declaration Statement will be revised to clarify that a five-year review will not be required for the selected remedy.

3. Comment: **Section:** ***Declaration Statement for Site 27 – Northern Channel: Authorizing Signature***

On Page X, please change the name of the Water Board's executive officer (EO). Our new EO is Mr. Bruce H. Wolfe.

Response: Comment noted. The Navy will revise the authorizing signature in the Declaration Statement.

4. Comment: **Section 1.6:** ***Site Description***

In the last bullet on page 5, in the debris pile description, please specify if the majority of debris is dredged sediment from the Northern Channel or what percentage is characteristic to each constituent.

Response: The Navy does not have detailed information on the buried contents within the debris pile to characterize the debris.

5. Comment: **Section 1.7:** ***Ownership***

- **Please add to the first sentence of this section that the different ownership area along the Northern Channel is shown in Figure 2.**
- **In the third paragraph on page 8, please specify where the storm water is discharging from the North Patrol Road Ditch (known as the Navy Ditch), from the Patrol Road Ditch, and from the Marriage Road Ditch.**

Response: The Navy will revise Section 1.7 to identify that Figure 2 shows the different property owners.

The Navy will also revise the third paragraph to clarify the locations where stormwater discharges from each ditch.

6. Comment: **Section 5.7** ***Nature and Extent of Contamination***

This section should include references to the sampling performed on the southeastern berm of the Northern Channel, which lies within Lockheed Martin property. This section should also include references to the down gradient sampling points, along the Moffett Channel and if/how the residual contamination in this area will be addressed in the South Bay Salt Pond Restoration Project.

Response: The Navy will include a discussion of the new Lockheed berm data (referred to as the Southern berm by the reviewer) in the draft final ROD.

The Navy cannot make recommendations about the South Bay Salt Pond Restoration Project because it is not applicable to the draft final ROD.

Therefore, the Navy does not plan to include information on Moffett Channel and the South Bay Salt Pond Restoration Project in the draft final ROD.

7. Comment: Table 3. Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARAR)

On page 36, please delete "comprehensive" from the name of Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan).

Response: Comment noted. The Navy will delete "comprehensive" from Table 3 (and Table C-1 in Appendix C).

RESPONSES TO COMMENTS FROM USFWS

Overall Concerns

1. Comment: **The Service agrees with the selection of Alternative 2 as the selected remedy, but is concerned that the action levels proposed are not sufficiently protective of wildlife species, including benthic organisms.**

Response: The Navy appreciates USFWS's concurrence with the selected remedy. The cleanup goals were developed through a collaborative approach with the regulatory agencies (EPA, Water Board, and USFWS) during development of the feasibility study (Tetra Tech EM Inc. 2003). The rationale for basing action levels on avian receptors is summarized in Section 2.0 of the feasibility study report. Because sediment in the majority of the Northern Channel will be removed down to the clay layer, the selected remedy is expected to be fully protective of benthic organisms.

Specific Comments

1. Comment: **Pages 20, 21. Please include the actual concentrations for all locations on the figures, rather than "<*AL*" or no data posted for those less than the action goal. The yellow highlighting of those concentrations above the action goals is sufficient to distinguish between the two types of results.**

Response: The Navy will revise the figures in the draft final ROD to present only chemicals with concentrations exceeding cleanup goals. Maps showing all chemical concentrations were presented on the plates in the final feasibility study report (Tetra Tech EM Inc. 2003) and will not be reproduced in the draft final ROD. Copies of the feasibility study report were provided to USFWS in 2003; however, an additional electronic copy of the report can be provided to the reviewer if requested.

2. Comment: **Page 18. Please provide a separate set of figures for the inorganic chemicals of concern that are similar to those provided for the organics, but with all data posted. In addition, please provide figures and/or summary data tables for surface water and biotic tissue sample results.**

Response: The Navy will revise the figures in the draft final ROD to present only chemicals with concentrations exceeding cleanup goals. Concentrations of metals and chlordane exceeding cleanup goals also will be presented on the figures. Tables and figures (Tables 3-4, 3-6, and 3-7 and Plate 2) summarizing the metals of concern were presented in the final feasibility study report (Tetra Tech EM Inc. 2003).

Appendix C of the final feasibility study report (Tetra Tech EM Inc. 2003) provides summary statistics for concentrations of chemicals of concern in tissue, sediment, and surface water. Table C-8 provides summary data for surface water collected from the Northern Channel. Tables C-1 and C-2 provide summary data for fish and plant tissue collected from the Northern Channel.

According to EPA guidance (EPA 1999), the purpose of the ROD is to document the remedial action plan for a site. EPA guidance further states "while the ROD should provide a comprehensive description of site conditions, the scope of the action, the Selected Remedy, cleanup levels, and the reason for selecting the remedy, it is only one part of the Administrative Record file, which contains the full details of site characterization, alternatives evaluation, and remedy selection."

As a result, the Navy believes it is not necessary to include the detailed characterization figures and summary data tables in the draft final ROD because they were presented in the feasibility study (Tetra Tech EM Inc. 2003).

3. Comment: **Pages 23, 28, 31. Please relate the statement regarding "little or no likelihood of adverse effects from exposure to surface water" on page 28 and similar statements on page 31 to the exceedances of ambient water quality criteria noted on page 23.**

Response: The Phase II site-wide ecological assessment (SWEA) (PRC Environmental Management, Inc. and Montgomery Watson 1997) provided an assessment of ecological risk from exposure to concentrations of chemicals in surface water using multiple lines of evidence, such as calculating hazard quotients (HQ) and conducting laboratory tests. Assessment of all lines of evidence suggested that there was little or no potential risk from exposure to concentrations of chemicals in surface water at Site 27 (PRC Environmental Management, Inc. and Montgomery Watson 1997). The final feasibility study report (Tetra Tech EM Inc. 2003) and the proposed plan (Tetra Tech FW, Inc. 2004) also document these findings.

The following was stated as a summary in the final feasibility study report "Based on the results of surface water bioassays for the Phase II SWEA (PRC Environmental Management, Inc. and MW 1997), it was concluded that there is little to no likelihood of adverse effects from surface water exposure. Surface water data collected in May 2002 also supports the assumption that concentrations of the nine chemicals of ecological concern are low or not detected in surface water." More detail on the May 2002 dataset is provided in Section 3.4.5 of the final feasibility study report (Tetra Tech EM Inc. 2003).

4. Comment: **<u>Pages 29, 32</u>. Please note whether the toxicity reference values (TRV) used were based on no or lowest observable adverse effect levels (NOAEL) or lowest observable adverse effect levels (LOAEL), respectively or mid-range adverse effects (e.g., high TRV). In addition, please identify what level of TRV was used in the calculation of the hazard quotient (HQ).**

Response: Both the high and low toxicity reference values (TRV) were used to calculate the HQs discussed on Page 29 and presented in Table 1. The high TRVs were used to calculate the lower HQs, and the low TRVs were used to calculate the upper HQs. High TRVs are based on the mid-range of sublethal effect levels for a chemical, and low TRVs are consistent with chronic no effects levels (Navy 1998). The allowable exposure levels discussed on Page 32 and presented in Table 2 were back-calculated using high TRVs. The high TRV was chosen for the back-calculations in a collaborative process with the agencies during development of the final feasibility study because of the following reasons: (1) actual toxicological effects are associated with the high TRVs, (2) the low TRVs are based on no effects levels, and (3) back-calculations using the low TRVs often result in concentrations that cannot realistically be used as allowable exposure levels for remediation (Tetra Tech EM Inc. 2003).

5. Comment: **<u>Page 31</u>. Surface water, even if not independently toxic, contributes to the overall exposure of the organism. The exclusion of this component in the risk calculations increases the uncertainty and may result in underestimation of potential risk.**

Response: Exposure to chemicals of ecological concern from surface water ingestion was assessed as part of the ecological risk assessment and doses from ingestion of COECs in surface water were included in the food chain models. Details of the food chain modeling are presented in Tables 2-12 through 2-19 of the Site 27 final feasibility study report (Tetra Tech EM Inc. 2003). The Navy will revise Section 7.3.1 in the draft final ROD to include a statement that explains that surface water ingestion was included in the food chain model for birds.

6. Comment: **<u>Page 32</u>. Please explain how the allowable exposure levels for sediment relate to potential surface water concentrations and whether the estimated surface water conditions would exceed ambient water quality criteria for aquatic life.**

Response: Surface water was not included as a medium of interest because exposure to chemicals in surface water was considered to pose little or no potential risk, as summarized in the final feasibility study report (Tetra Tech EM Inc. 2003). (Please see response to USFWS Specific Comment 3.) However, as stated in the response to USWS Specific Comment 5, exposure to chemicals of ecological concern from surface water ingestion was included in the food chain models for the avian receptors.

7. Comment: **<u>Pages 35, 64.</u> The statement that criteria developed for avian receptors will be protective of benthic invertebrates is not supported by any presented analysis. Based on comparison to sediment toxicity data for freshwater benthic invertebrates, it appears that the proposed criteria for avian receptors may not be protective of benthic invertebrates and/or fish. For example, the values proposed for cadmium (184 mg/kg) exceed by over 10 times all the probable effects level benchmarks (up to 10 mg/kg) for freshwater benthos (MacDonald et al., 2000*)*. In addition, the proposed sediment action goals for lead, mercury, zinc, and total chlordane exceeded adverse effect thresholds for benthos.**

Response: The Navy will delete the statements regarding benthic invertebrates from pages 35 and 64 from the draft final ROD. The decision to develop cleanup goals based on birds was made with the regulatory agencies during the feasibility study process based on analysis of existing invertebrate data. The selected remedy will remove most of benthic exposure media.

8. Comment: **<u>Pages 45, 47</u>. Please explain why ongoing monitoring and five-year reviews would not be required for remedial alternatives 2, 3A, and 3B to ensure restoration activities were successful and residual contamination did not cause ecological impacts, particularly since potential adverse effects may occur at concentrations below the action goals.**

Response: Ongoing monitoring and five-year reviews are not required for the selected remedy (Alternative 2) because chemicals of potential ecological concern detected at concentrations that exceed RAOs would be excavated and removed to a landfill, permanently eliminating risks for both human health and ecological receptors associated with contaminated sediment. Please see the final feasibility study report for further detail (Tetra Tech EM Inc. 2003). Alternatives 3A and 3B also would not require ongoing monitoring and five-year review if implemented because the treatment activities would eliminate potential unacceptable risks to human and ecological receptors. Please also see response to EPA Specific Comment 16c.

9. Comment: **<u>Page 49</u>. Please describe the change in amount and quality of habitat under the proposed capping of sediments.**

Response: Section 9.4.1 (Page 49) of the ROD is intended to provide a brief summary of the capping alternatives evaluated in the final feasibility study report and is not intended to provide a detailed evaluation of these alternatives. The Navy is not proposing to implement a capping alternative; therefore, an evaluation of the change in the amount and quality of habitat under the capping alternative was not conducted.

RESPONSES TO COMMENTS FROM ERIC WATKINS, NASA AMES RESEARCH CENTER

1. Comment: **<u>Page 15, 3rd para</u> – The western pond turtle is protected as a California Species of Special Concern. The Moffett Field population is the only one remaining in Santa Clara County.**

Pursuant to the Migratory Bird Treaty Act, excavation would not occur during the months of May and June to protect nesting.

Response: The text will be revised to identify the western pond turtle as a California Species of Special Concern. NASA has stated they will be responsible for natural resources compliance issues regarding the Site 27 remedial action. The Navy is working closely with NASA's biologists to ensure potential impacts are minimal.

Table C-2 of Appendix C in the ROD lists the Migratory Bird Treaty Act of 1972 as a location-specific relevant and appropriate requirement; therefore, the remedial activities will adhere to the act by avoiding the breeding season.

2. Comment: **<u>Page 45, 9.2.1</u>, replace "a biological assessment of the area would be completed to identify threatened or endangered species, and appropriate measures would be taken to minimize the impact." with "section 7 consultation under the Endangered Species Act and the capture and temporary relocation of western pond turtles would be completed."**

Shouldn't regulatory constraints be included in all alternatives except the No Action?

Response: Table C-2 of Appendix C in the ROD lists the Endangered Species Act of 1973 and the California Endangered Species Act as location-specific relevant and appropriate requirements; therefore, remedial activities will adhere to the substantive portions of this act, including Section 7 consultation. NASA has begun the Section 7 consultation with the U.S. Fish and Wildlife Service (NASA 2005). Section 6 of the Endangered Species Act also includes cooperative agreements with the states; therefore, a consistency determination will be requested from the California Department of Fish and Game.

ARARs were identified and evaluated in detail for each alternative in Sections 2.5.2 and 6.2 of the final feasibility study report (Tetra Tech EM Inc. 2003). The ARARs for Site 27 are provided in Appendix C of the ROD.

RESPONSES TO COMMENTS FROM LIBBY LUCAS

1. Comment: **In regards the October 14, 2004, Record of Decision on Moffett Field - Site 27 – Northern Channel, I still have concerns over the relocation and habitat conservation plan for the Western Pond Turtle Colony that will be impacted by sediment removal in the Northern Channel and in the Marriage Road Ditch.**

In the Sensitivity Species Surveys that were conducted by U.S. Fish and Wildlife Service and SFBBO at Moffett Field in 1994 please note on Page 59 and 60 a recital of the limitations the golf course poses for amphibians such as the use of pesticides and herbicides which create toxic runoff, the open lawns leave migrating individuals vulnerable to predation, and rodent control eliminates aestivation sites.

The study goes on to say that seasonal wetlands are severely degraded by garbage dumping, and vegetation is mowed all around the ponds and emergent vegetation is removed, eliminating cover and reducing habitat. The six golf course ponds are filled with brackish water that becomes increasing saline throughout the summer.

"Of the two drainage ditches, only the Patrol Road Ditch is likely amphibian habitat. All vegetation is removed from the Marriage Road Ditch to prevent flooding, but the Patrol Road Ditch...is allowed to retain vegetation which consists mostly of brackish to salt marsh vegetation and ruderal plants, which indicate disturbance."

This Sensitive Species Survey does not mention a Western Pond Turtle colony but its documentation of existing conditions for amphibian habitat raises serious doubts about the Jones and Stokes' relocation plan that is presently proposed for turtles.

Response: Remedial activities will adhere to the substantive portions of the California Endangered Species Act, including Section 7 consultation. NASA has begun the Section 7 consultation with the U.S. Fish and Wildlife Service (NASA 2005). Section 6 of the Endangered Species Act also includes cooperative agreements with the states; therefore, a consistency determination will be requested from the California Department of Fish and Game.

ARARs were identified and evaluated in detail for each alternative in Sections 2.5.2 and 6.2 of the final feasibility study report (Tetra Tech EM Inc. 2003). The ARARs for Site 27 are provided in Appendix C of the ROD.

2. **Comment:** **The number of turtles mentioned in the Jones and Stokes study, as being in the project area, is considerably less than what was noted in the NASA EIS/EIR of 2001 and that colony was said to be found also in the Northern Channel, was it not?**

   Response: The Navy is unable to comment on the difference of turtle population from the Jones and Stokes report and the NASA count.

3. **Comment:** **The Western Pond Turtle uses dirt banks in which to lay its eggs and the Marriage Road Ditch and the Golf Course ponds will not provide this essential refugia. Where are these Western Pond Turtles now laying their eggs and how is this element of their habitat being preserved? Will it remain accessible?**

   Response: Proposed actions will be implemented in a manner that will minimize any negative impacts to the western pond turtle colony. As part of the remedial design for Site 27, NASA will conduct surveys of the current western pond turtle colony, oversee temporary relocation of the turtles to the golf course ponds, and identify efforts to ensure disruption of the turtle colony is minimized during remedial activities. Remedial activities will also be minimized to the extent practical during the breeding season.

4. **Comment:** **Could we have a second opinion on this Western Pond Turtle colony relocation and recovery plan? On inquiry, Dave Johnson of California Department of Fish and Game says they use a San Diego expert <RHGoodman@aol.com> for Western Pond Turtle consultation. As Western Pond Turtles are a California Species of Special Concern and as this is the only viable colony in Santa Clara County this relocation plan needs to be done correctly, and must include long term monitoring and management action. (The sharp decline in the Burrowing Owl population at Moffett Field in spite of NASA's recovery plan does not give anyone a feeling of confidence in present implementation)**

   Response: NASA, in conjunction with a knowledgeable resource specialist, will further assess management options associated with the western pond turtle during the remedial design phase of this project (NASA 2005). Also see the response to previous comment.

5. **Comment:** **This is not quite all that I would like to comment on in regards the Northern Channel cleanup but feel the Western Pond Turtle aspect of the ROD merits priority attention.**

Other concerns are more in the nature of conjecture that the underground plume had traveled under Moffett's airfield to such an extent by the early 1980's that it must be under the Northern Channel by now. Will this complicate Site 27 sediment removal?

Response: The Navy has not found evidence that contaminated groundwater associated with an underground plume is related to the chemicals present in sediments from the Northern Channel or related areas. Therefore, the final feasibility study report focused on sediment and, to a lesser extent, surface water in the Northern Channel and related areas but it did not evaluate groundwater.

6. Comment: If most toxics in the Northern Channel are a result of decades of routine airfield use, what vegetative buffers will be introduced around the field and in drainage ditches to assure stormwater runoff meets San Francisco Bay Basin water quality standards?

What will this vegetative buffer consist of in the wetlands and in the uplands? Will the marsh management design be available for review? Can there be a fifty-foot wide upland marsh vegetation strip buffering the Bay on the northern Bayfront levees?

Response: The Navy believes that chemicals in the Northern Channel are from industrial and maintenance activities at the airfield. Revegetation of the berms and ditches will be evaluated and presented in the remedial design phase and will be available for review in the future. NASA administers the storm water management program and can best address storm water management concerns.

7. Comment: Would it be possible for the golf course maintenance regimen not to include nutrients that would alter the native grasses or use pesticides and herbicides?

Response: Comment noted. This comment will be forwarded to the golf course manager.

RESPONSES TO COMMENTS FROM EOA, INC., ON BEHALF OF THE CITY OF SUNNYVALE

1. Comment: **<u>Declaration Statement, pg. vii</u>. At the bottom of this page, in "Description of Selected Remedy" the last sentence contains the statement "Total polychlorinated biphenyls consisted of Aroclor-1254 and Aroclor-1260 because no other Aroclors were detected and the congener-specific data did not support the presence of other Aroclor…". This appears to be an over-simplification of the information presented in the November 6, 2003 Feasibility Study Report. We suggest that something like the following wording would be more correct: "Total polychlorinated biphenyls consisted of Aroclor-1254 and Aroclor-1260. Although some lighter and heavier congeners were detected, the congener-specific data did not support the presence of other Aroclors…".**

Response: The Navy believes the statement as currently worded is accurate. Aroclor-1254 and -1260 were the only detected Aroclors in the samples collected at Site 27 (see Appendix C of the final feasibility study report [Tetra Tech EM Inc. 2003]). Detected concentrations of lighter congeners were consistent with degradation products that would result from the anaerobic dechlorination of the heavier congeners that make up Aroclor-1260 (see Appendix D of the final feasibility study report [Tetra Tech EM Inc. 2003]). Although heavier congeners were detected, the congener data were generally consistent with the Aroclor data, revealing varying mixtures of Aroclors-1254 and -1260.

2. Comment: **<u>Section 5.7, Nature and Extent of Contamination, pg. 16</u>. The first paragraph states that "storm water is known to be a major source of non-point pollution in urban and residential areas across the United States…" and that "Contaminants adsorb onto soil and sediment and can be transported with sediment to the storm drain system…"**

It is not clear how these statements are relevant to the overall ROD or to this section specifically. If the intent is to explain that the northern channel was polluted by stormwater runoff from other locations on the former NAS Moffett Field, then that statement should be made clearly at the end of the first paragraph.

In the second paragraph it is stated that "concentrations of metals in sediments in the northern channel are found to be similar to concentrations in other sediments that receive urban runoff." This statement is clearly not supported in the report by reference or data. It is also probably not necessary for this discussion. We suggest that it should be deleted. If it is necessary to retain this statement, it should be supported by reference and/or data, and it should be

clarified that this is not intended to imply that urban runoff was a source, other than drainage from the former NAS Moffett Field.

Response: The Navy will delete the first paragraph of Section 5.7 and will revise the former second paragraph of Section 5.7 to clarify that the source of metals is likely from nonpoint source pollution. Stormwater from urban areas adjacent to and from areas within the former Naval Air Station (NAS) Moffett Field is a source of nonpoint source pollution because the Northern Channel has historically been flooded by bay water from the Moffett Channel and the former Cargill Salt evaporation ponds when heavy rainfall coincides with high tidal events (spring tides).

3. Comment: **<u>Figure 3, pg. 17</u>. It is our opinion that footnote 1 and the box denoting "Regional Surface Runoff" should be deleted if this figure is intended to refer specifically to the northern channel. If this figure is intended to apply at some point further downstream such as in the Moffett Channel or the south bay, then that should be clarified in the title or the text that discusses the figure.**

Response: The Navy believes regional surface water runoff was a historical source of chemicals in sediments and surface water in the Northern Channel. Please see response to previous comment.

RESPONSES TO COMMENT FROM TERI PETERSON, ENVIRONMENTAL MANAGER, CARGILL

1. Comment: **Per our conversation on the telephone today, I just wanted to reiterate that Cargill would appreciate an opportunity to comment if the decision is made to use industrial PRGs as clean-up goals for the berms, rather than the RAOs. Other than that, I have no additional comments on the draft Record of Decision, dated October 14, 2005. Thank you for the opportunity to comment.**

Response: Comment noted.

RESPONSES TO COMMENTS ON THE DRAFT FINAL RECORD OF DECISION FOR SITE 27 – NORTHERN CHANNEL FORMER NAVAL AIR STATION MOFFETT FIELD, CALIFORNIA

This document presents the U.S. Department of the Navy's responses to comments on the "Draft Final Record of Decision for Site 27 – Northern Channel, Former Naval Air Station Moffett Field," dated May 16, 2005. Comments on the draft final record of decision (ROD) were received from EOA, Inc., on behalf of the City of Sunnyvale on June 9, 2005.

RESPONSES TO COMMENTS FROM EOA, INC., ON BEHALF OF THE CITY OF SUNNYVALE

1. Comment: **The City is pleased to see the additional clarification of the Navy's intent that distinct soil remediation goals will be applicable for soils on or near the tops of the berms, rather than applying those standards which were developed specifically for sediment remediation. The draft ROD clarifies that the sediment Remediation Objectives, which are based on ecological risk to biota within the channel, will be applied to the sediment removal part of the remedial action, and that EPA Region IX's Preliminary Remediation Goals (PRGs) will be applicable to the soil cleanup higher up on the berms.**

We agree with the concept of applying separate objectives to the sediment in the channel and to the soil in the berms, and we feel that is reasonable and protective of both ecological receptors and human health. Soils located on or near the top of these berms are well removed from any residences, offices, or similar uses, and have essentially no potential for such use in the future. For that reason, the industrial PRGs were referenced as the soil remediation objectives in the discussions at the Site 27 Stakeholders Meetings held in fall and winter of 2004, as well as in the January 11, 2005 draft of the "Technical Memorandum Site 27 Northern Channel Berm Sampling." Given this history and background, we request an explanation of why residential PRGs are now for the first time proposed for this clearly non-residential location. In the absence of such support, it would seem more appropriate that the draft ROD return to the concept previously discussed among the stakeholders of using the industrial PRGs for berm soil remediation objectives.

Response: The residential preliminary remediation goals for soil (U.S. Environmental Protection Agency 2004) were identified as cleanup goals for soil in the berms along the Northern Channel based on comments from the EPA on the draft "Technical Memorandum Site 27 Northern Channel Berm Sampling" (Tetra Tech FW Inc. 2005).

2. Comment: **Regarding our December 13, 2004 comment on the several references to pollution from "regional surface runoff" and "urban runoff", we appreciate your acknowledgement of those comments and we appreciate the changes that were made in response (Appendix D, Page 28 of the May 2005 version of the ROD). However, we feel that these edits did not fully address the City's concerns. The continued inclusion of "Regional Surface Runoff" as a source in Figure 3, page 17, and the statement that "Storm water from the urban areas adjacent to and from areas within the former NAS Moffett Field is a source of contamination" could still be interpreted as implying that storm water runoff from adjacent urban areas contributed to the pollution in the northern channel. We repeat our earlier comment that contribution from such offsite sources has not been demonstrated in any of the supporting investigation reports. Rather, the supporting reports demonstrate that the pollution in the northern channel originated on the Moffett Property, and we again request that the references to regional runoff, urban runoff, and other sources be deleted from Figure 3 and from the text wherever they appear in this ROD.**

Response: The fourth sentence of Section 5.7 was revised to state "Stormwater from areas within the former NAS Moffett Field is a source of contamination." The Northern Channel is bordered by multiple property owners; therefore, regional surface water runoff is identified as a potential release mechanism for contamination on Figure 3. Bay water from the Moffett Channel and overflow from the former Cargill Salt evaporation ponds during heavy rainfall coinciding with high tidal events (spring tides) also contributes some regional runoff to the Northern Channel.

3. Comment: **Finally, on page 6 of the Final Draft, in Section 1.7 Sunnyvale is still listed among the owners of "the northern channel and related areas within Site 27." The City has on several occasions requested clarification regarding whether Site 27 and/or the proposed remedial action extends at all onto Sunnyvale's property. Similarly, the City has requested that the Navy remove the City of Sunnyvale from the listed owners if Sunnyvale does not own property that is actually within the Site 27 boundaries. To date, we have not been provided with sufficient detail to know for certain whether the proposed remediation will extend onto Sunnyvale property. We believe that this question should have been resolved by the recent boundary survey. We request that the Navy confirm whether Site 27 and/or the proposed remediation extend onto Sunnyvale's property in any location(s). If the Navy can confirm this, please provide us with information with sufficient detail to support the inclusion of Sunnyvale on this list. If not, we again request that you remove Sunnyvale from the list of owners of Site 27 and edit the text [to]**

clarify that the Sunnyvale property described in Section 1.7 is adjacent to Site 27 rather than within the site.

Response: The Navy is working with the City of Sunnyvale to identify the property boundaries along the Northern Channel. The Navy and City of Sunnyvale conducted a site visit on June 14, 2005, along the Northern Channel. An additional site visit will be conducted once the surveyed property corners are located by the Navy.

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ATTACHMENT 1
FIGURE 1 LOCKHEED BERM SOIL SAMPLING LOCATION FORMER NAVAL AIR STATION MOFFETT FIELD, CALIFORNIA

(Source: Tetra Tech FW, Inc. 2005. "Technical Memorandum, Site 27 Northern Channel Berm Sampling, Former Naval Air Station Moffett Field, Moffett Field, California." January.)

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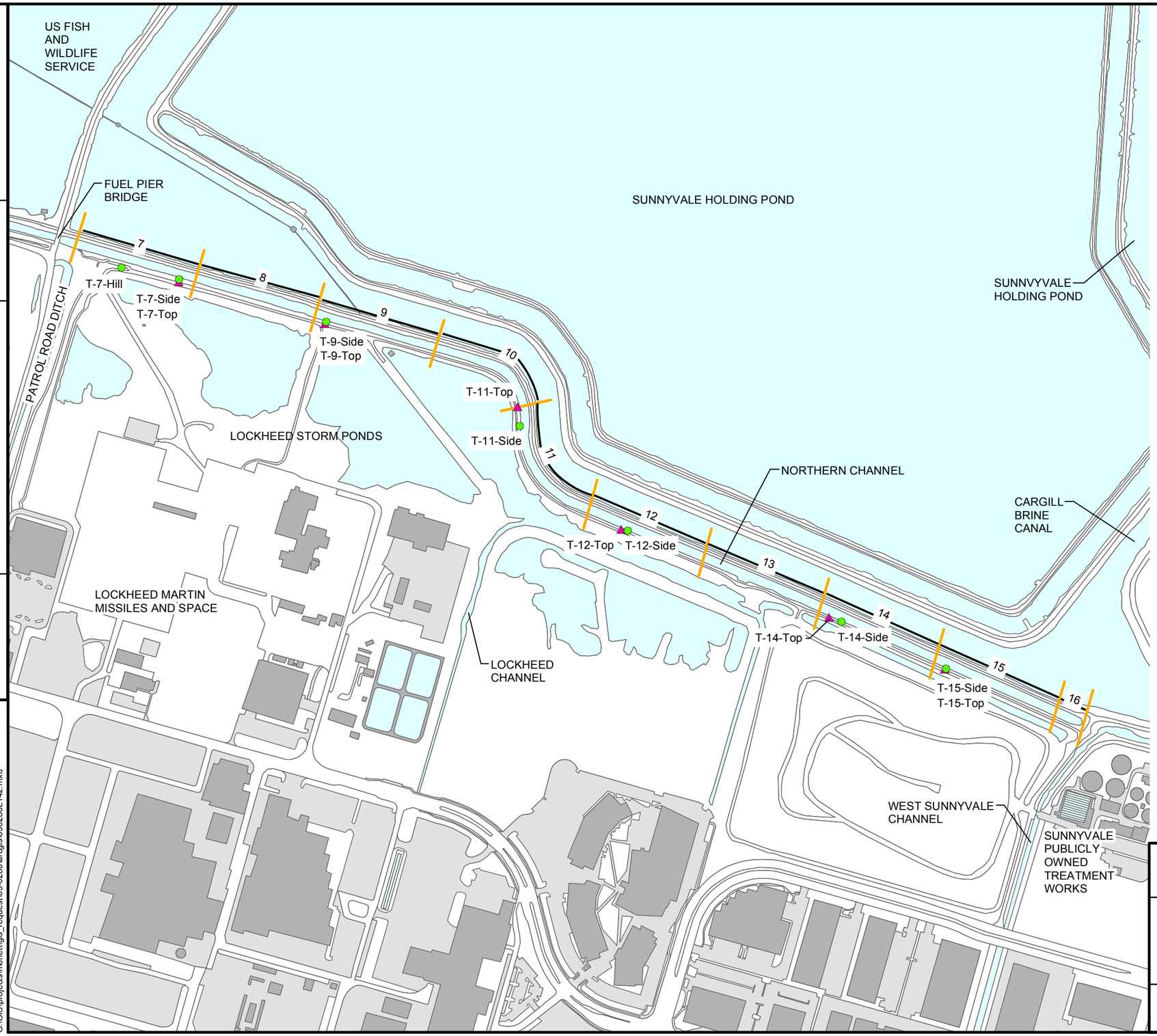

LEGEND

- SIDE SOIL SAMPLE LOCATION
- TOP SOIL SAMPLE LOCATION
- TRANSECT BOUNDARY
- 15 — TRANSECT EXTENT AND NUMBER
- T-12-TOP — TRANSECT NUMBER AND SAMPLE LOCATION
- ROAD
- PAVED SURFACE
- BUILDING
- WATER/WETLAND

N

250 0 250 500 Feet

Scale: 1" = 500'

DATUM: HORIZONTAL - NAD83, VERTICAL - NGVD29

BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

FIGURE 1

LOCKHEED BERM SOIL SAMPLING LOCATIONS

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CA

TETRA TECH FW, INC.