SECTION 1

Introduction

This introduction provides the background and purpose of the Record of Decision/Remedial Action Plan (ROD/RAP), presents an overview of the property and sites being addressed, and describes the hydrogeological setting, ecological communities, and land uses of the property and sites. This introduction also presents the organization of the remainder of the document.

1.1 Background

This document was developed by the United States Department of the Army (Army), the Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB). The Former Hamilton Army Airfield (HAAF) has been owned and operated by various branches of the Department of Defense from 1932 to the present. See Figure 1-1 for the location of HAAF. (All figures are included at the end of this section, following the tables for Section 1.) This closed military facility is on the State's Cortese List, but not on the National Priority List (NPL). The Army is responsible for environmental remediation of the Main Airfield Parcel at HAAF as the Department of Defense owner of the property at the time of closure under the Base Realignment and Closure Act of 1988 (BRAC). See Figure 1-2 for BRAC property locations.

This ROD/RAP presents the environmental response actions to be taken by the Army BRAC restoration program and additional environmental assurances to be provided by actions that the Army Civil Works Program will take through the Hamilton Wetland Restoration Project (HWRP) to address potential risks associated with residual contaminants on the Main Airfield Parcel at HAAF and restoration of a wetland at HAAF.

For the Army, the term "environmental actions" relates to Army BRAC response actions and the environmental assurance actions by the Army Civil Works Program. The HAAF Main Airfield Parcel consists of two distinct areas: (1) the Inboard Area includes the eastern perimeter levee and the property to the west of the eastern perimeter levee; and (2) the Coastal Salt Marsh Area includes the Army-owned property east of the eastern perimeter levee. This ROD/RAP evaluates sites located in the HAAF Main Airfield Parcel and adjacent coastal salt marsh owned by the California State Lands Commission (SLC). The Army BRAC program will perform the environmental response actions for the sites listed in Table 1-1 in accordance with Executive Order 12580; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (42 USC Section 9601 et seq.); and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). (All tables for this section are included at the end Section 1.) These response actions will benefit the future land use plans for wetland restoration. The Army Civil Works Program through the HWRP, and in accordance with Section 101 (b)(3) of the Water Resources Development Act of 1999 (WRDA), will take actions to address the potential risks posed by Inboard Area-Wide DDTs and polynuclear aromatic hydrocarbons (PAHs) in soils adjacent to the runway. The Civil Works' ability to participate in the project is subject to the limitations of the project authority.

DTSC and the RWQCB (collectively, the "State") are regulating these environmental actions as environmental response actions in accordance with the provisions of California Health and Safety Code; this document constitutes a RAP subject to Chapter 6.8 of Division 20 of the California Health and Safety Code Section 25356.1. The RWQCB, with DTSC support, will be the lead state agency for oversight of the implementation of this ROD/RAP. The RWQCB, as authorized by the Porter Cologne Water Quality Control Act, will adopt site cleanup requirements (SCRs) that will ensure implementation of the final approved ROD/RAP. Through these SCRs, the State will ensure that agreed-upon environmental assurance actions are taken to address residual concentrations of Inboard Area-Wide DDTs and PAHs in soils adjacent to the runway through the imposition of Waste Discharge Requirements (WDRs) governing the implementation of the HWRP.

The State and Army acknowledge that they have different views regarding the scope of the Army's legal responsibility for the residual concentrations of Inboard Area-Wide DDTs and PAHs in soils adjacent to the runway. Nevertheless, both parties are in full agreement as to the measures necessary to address the remaining contamination, including these residuals, on the HAAF site.

The Army anticipates transferring 630 of the 644-acre HAAF Main Airfield Parcel to the California State Coastal Conservancy (SCC) to become part of the HWRP. The remaining 14 acres is located under the New Hamilton Partners' levee and it is anticipated that this property will be transferred to the City of Novato. The majority of the coastal salt marsh is currently owned by the SLC, having been transferred to the State of California from the Army in 1984. The HWRP is a federal project authorized by the WRDA. The U.S. Army Corps of Engineers, San Francisco District (USACE), will construct the HWRP, and will monitor and adaptively manage it for 13 years thereafter. The SCC, as the local sponsor, would be responsible for operation and maintenance of the HWRP from project completion forward. This ROD/RAP presents the environmental actions to be conducted by the Army necessary to protect public health and the environment based on the proposed future use of the property for wetland restoration. The Hamilton Reuse Plan designates the Main Airfield Parcel as open space for wildlife habitat restoration and wetland restoration use. If the HWRP does not proceed or is not completed, this ROD/RAP may be reopened to address environmental actions for other land uses.

The information supporting the environmental actions is contained in the Administrative Record (see Appendix A). The content of the ROD/RAP is based on DTSC policy EO-95-007-PP and the U.S. Environmental Protection Agency's (EPA's) *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA, 1999).

1.2 Facility Overview

HAAF is a former military installation located on a diked and subsided bayfront parcel in the City of Novato, California. A perimeter levee excludes tidal waters from the inboard area of the former installation. The 644-acre Main Airfield Parcel and other parts of HAAF were identified for closure under BRAC. There are 10 acres of the parcel that lie outboard of the perimeter levee in the coastal salt marsh. The remaining portion of the coastal salt marsh (approximately 78 acres) is located on property owned by the SLC. Some of the sites being addressed in this ROD/RAP extend beyond the Army BRAC property boundary onto property owned by the SLC. Figure 1-3 shows the areas that are the subject of this ROD/RAP.

The U.S. Army Air Corps constructed HAAF on reclaimed tidal wetland in 1932. Before 1932, the area was known as Marin Meadows and had been used as ranch and farm land since the Mexican Land Grant (USACE, undated). Military operations began in December 1932. Bombers, transport, and fighter aircraft were based at the airfield. HAAF played a major role in World War II as a training field and staging area for Pacific Theater operations. The Airfield was renamed Hamilton Air Force Base in 1947, when it was transferred to the newly created U.S. Air Force (USAF).

In the mid-1960s, the USAF began to curtail Base operations because of increased complaints about aircraft noise and concerns for air traffic and public safety (Earth Technology Corporation [ETC], 1994). In 1974, the USAF deactivated the Base and initiated transfer of the property to other military or government agencies. In the transfer process, the residential portion of the installation, along with support facilities, was transferred to the U.S. Navy in 1975. Custodial management of other areas was taken over by the General Services Administration (GSA). In 1976, the Army was given permission to use the runway and ancillary facilities and several other buildings for regular Army and Army Reserve operations. A parcel in the hangar area was transferred to the U.S. Coast Guard in 1983. The Army continued to use portions of HAAF on a permit basis until 1984, when the Army officially acquired portions of the airfield and property management responsibilities were transferred to the Presidio of San Francisco. Aircraft operations were again discontinued in 1994 when the base was closed.

The Inboard Area was used for a variety of military functions. These functions were supported by underground storage tanks (UST), aboveground storage tanks (AST), transformers and transformer pads, storm drain and sanitary sewer systems, the Former Sewage Treatment Plant (FSTP) (including sludge drying beds), fuel lines, revetment areas, and the Perimeter Drainage Ditch (PDD), which collected runoff from the Base, as well as from some surrounding agricultural lands. Portions of the coastal salt marsh were used to support Department of Defense operations on the main airfield. Activities within the coastal salt marsh included emergency rescue operations in San Pablo Bay and disposal of construction debris. Transformers and transformer pads, a winch at the boat dock, and a burn pit at the East Levee Construction Debris Disposal Area (ELCDDA) supported these activities. Additional features of the coastal salt marsh include the Outfall Drainage Ditch (ODD), which receives stormwater runoff and drainage from the main airfield, and the FSTP Outfall, which received main airfield sanitary and industrial wastes from the FSTP.

Based on historical investigations and removal actions to date, the types of contaminants detected at various sites within the HAAF Main Airfield Parcel and adjacent coastal salt marsh include:

- Total petroleum hydrocarbons (TPH), TPH-diesel (TPH-d), TPH-gasoline (TPH-g), jet fuel (JP-4), or TPH-motor oil (TPH-motor)
- Metals
- Dioxins and furans
- Volatile organic compounds (VOCs) such as benzene, ethylbenzene, toluene, and xylenes
- Semivolatile organic compounds (SVOCs) including PAHs

- Polychlorinated biphenyls (PCBs)
- Pesticides/herbicides

Analytical data indicate the presence of residual DDTs throughout the Inboard Area (see Figure 1-4). Analytical data indicate that residual PAHs are present in soils adjacent to the runway (see Figure 1-4).

1.3 Purpose

The objective of this ROD/RAP is to remove and/or cover contamination in the Inboard Area, rendering it suitable for open-space wetland restoration. For the coastal salt marsh, the alternative is to remove contaminated soils to the maximum extent practical to protect public health and to maintain its wetland function. For the coastal salt marsh, if any contaminants remaining above action goals are still a concern within the excavated areas, the site will be backfilled to prevent direct exposure to these contaminants. To achieve these objectives, environmental action contaminant concentration goals (action goals) protective of wetland receptors (including sensitive species) are established in this ROD/RAP. The action goals are based primarily on site-specific ambient concentrations, in combination with RWQCB-developed numbers for San Francisco Bay Ambient sediments in combination with National Oceanic and Atmospheric Administration (NOAA) effects-range low (ER-L) sediment concentrations. Table 1-2 presents these action goals. DDTs (DDT, and its breakdown products DDE and DDD) have been found throughout the HAAF in surface soils. DDTs are persistent and bioaccumulative toxic substances. It was agreed that soils containing a total concentration of DDTs in excess of 1 part per million (ppm) shall be excavated and disposed of offsite.

1.4 Hydrogeological Setting, Ecological Communities, and Land Uses

The following sections describe the hydrogeology, land use, biological habitats, and biota currently existing within the HAAF Main Airfield Parcel and adjacent marsh. This background information aids in the understanding of past work conducted within this area and is, in part, the basis for development of remedial alternatives.

1.4.1 Existing Hydrogeological Setting

Three shallow hydrogeologic units occur within the HAAF Main Airfield Parcel and adjacent marsh: fill, soft Bay Mud, and desiccated Bay Mud. The "fill" was originally used to reclaim the bay margin lowlands for agriculture and has very similar content and hydrogeological properties to the Bay Mud. A different type of "fill" referenced in the Remedial Investigation (RI) (IT, 1999a) is the imported construction material used for geotechnical applications and foundation and drainage properties and is not part of the hydrogeologic unit. This type of "fill" may be found in pipeline trenches and as a bridging layer beneath some of the formerly developed areas. This fill will be referred to as "imported fill" when used. Permeabilities and groundwater flow characteristics are summarized below:

- Fill materials have moderate to low hydraulic conductivities. Preferential groundwater flow through the fill may be controlled by the distributions of different fill types.
- Soft Bay Mud generally has low hydraulic conductivity. Preferential flow, if existent, is probably horizontal and confined to peat layers or shell lenses, which are discontinuous and limited in aerial extent.
- Desiccated Bay Mud has low hydraulic conductivity with some fracture permeability. The desiccation cracks are potentially transient in nature and may heal or infill during periods of saturation.

1.4.2 Groundwater Use

The HAAF is located on the eastern side of the Novato Creek groundwater basin and is part of the regional San Pablo groundwater basin defined by the drainage entering San Pablo Bay. Existing and potential beneficial uses of groundwater within the Novato Creek basin include municipal and domestic water supply, rare and endangered species preservation, freshwater wildlife habitats, and recreational use (RWQCB, 1995).

As part of the remedial assessment summary for the GSA Phase II Sale Area (IT, 1998), the available well records at the California Department of Water Resources (DWR) and Marin County Environmental Health were reviewed to evaluate the current regional uses of groundwater within the vicinity of the HAAF. The review included all domestic, industrial, and irrigation supply wells within a 2-mile radius of the airfield and included available DWR well logs and Marin County Environmental Health records. There are 11 supply wells located within a 2-mile radius of the HAAF. Most of the wells in the vicinity of the HAAF are used for domestic or irrigation supply, and all of these wells appear to be outside the influence of historical HAAF activities. Only one well is located within 1 mile of the HAAF property boundary.

Groundwater beneath the Main Airfield Parcel and adjacent marsh is not now, nor is it likely to be, used for drinking water. State Water Resources Control Board (SWRCB) Policy 88-63 specifies that total dissolved solids (TDS) in excess of 3,000 milligrams per liter (mg/L) renders groundwater unsuitable for drinking. The TDS concentrations in groundwater from monitoring wells across the property range from 819 to 18,270 mg/L with an average TDS concentration of 4,898 mg/L (IT, 1999a). These findings indicate that groundwater beneath the Main Airfield Parcel and adjacent marsh is generally unsuitable for drinking because the average TDS concentration exceeds the 3,000 mg/L limit.

Sampling activities for groundwater are discussed in Appendix B. Based on the findings presented in Appendix B, it is concluded that no further action is required for groundwater. Groundwater is not evaluated further in this ROD/RAP report.

1.4.3 Hydrology

HAAF is in the southern portion of the Novato Creek Drainage Basin and Watershed (EIP Associates, 1993). Historically, tidal marsh and mudflats covered the area. The main slough channel drainage system in the HAAF panhandle area (the rectangular area to the east of Ammo Hill and to the northwest of the triangular pond) drained to the northwest into the tidal reaches of Novato Creek (PWA, 1998), which then drained into San Pablo Bay.

Using a system of levees and drainage ditches, the area that is now HAAF was reclaimed for agricultural use in the late 1800s.

Surface water flow is generally from the upland areas in the west toward the San Pablo Bay in the east. From areas west of HAAF, Pacheco Creek and Arroyo San Jose carry surface water along the northwestern boundary of HAAF. Both Pacheco Creek and Arroyo San Jose discharge into the Ignacio Reservoir, which occupies approximately 120 acres and has a storage capacity of 480 acre-feet (JSA, 1998). The reservoir drains into Novato Creek through a leveed channel with a flap-gate outlet located at the Bel Marin Keys Boulevard bridge.

Stormwater drainage system conduits ranging in diameter from less than 12 inches to as large as 54 inches in diameter are distributed in several general areas of the HAAF. The component lines in each network span various distances and lie at various depths. One network drains the mid-airfield just north of the revetment area. Another network drains the revetment area itself, while a third drains the aircraft maintenance area to the west of the revetments. The drains in the Aircraft Maintenance and Storage Facility Area (AMSF) convey water to discharge into the PDD to the west of the central portion of the airfield (CH2M HILL, 2001). This water is then conveyed through a network of drainage ditches and the PDD, which conveys drainage to three pump stations (Buildings 35, 39, and 41) on the margin of San Pablo Bay.

Runoff from the adjacent Landfill 26 area and 40 acres in the northern Reservoir Hill area enters the panhandle and drains into the PDD, located parallel to the northern border of the airfield. The runoff from the north side of Reservoir Hill enters the panhandle through a culvert in the south corner of the panhandle. Modified underground storm drains along the northwest and southwest sides of the panhandle convey Reservoir Hill runoff into the northern PDD. The northern PDD conveys stormwater to the eastern end of the airfield, where the aforementioned three pumps transport runoff from the airfield into San Pablo Bay (JSA, 1998).

Seasonal surface runoff from the Landfill 26 area is routed around the landfill in grass-lined swales and temporary ponds into a small depression north of the landfill. This pond releases runoff to the panhandle via a 4-foot-diameter tide-gated culvert that empties into a drainage ditch, then enters a seasonal wetland mitigation site. When water in the wetland reaches an elevation of –3 feet National Geodetic Vertical Datum (NGVD), it spills over a constructed weir into the PDD (PWA, 1998). A portion of the PDD, located along the southern and eastern sides of the airfield, carries runoff from other parts of the airfield and from adjacent property west and south of the airfield to the HAAF pumps (PWA, 1998). The PDD system receives drainage from the New Hamilton Partnership development, the eastern portion of the Coast Guard housing area, and other areas adjacent to the west side of the airfield that are conveyed to the ditch in two outfalls: one near Reservoir Hill (west outfall) and one near the southwest corner of the airfield (east outfall) (JSA, 1998). The PDD collects and transports runoff inboard of the levees and routes it to pump stations on the east side of the property. Pumps transport the water over the levee where it discharges into the ODD (IT, 1997a), which empties into San Pablo Bay.

1.4.4 Existing/Future Land Use

Inboard Area

The Main Airfield Parcel has not been used for military operations since the mid-1980s with the exception of infrequent runway use before 1994. Currently, site features include paved areas such as parking areas, the abandoned runway and former revetment areas; nonpaved areas of both upland and wetland habitat; and several structures (most of which are abandoned). The Environmental Baseline Survey (CH2M HILL, 2003b) provides additional information on existing and former buildings and their uses. A wetland mitigation area was also constructed near the northern end of the former runway as a mitigation project associated with Landfill 26, which is located adjacent to the HAAF Main Airfield Parcel and is not a part of this ROD/RAP. As described in the previous section, the PDD provides drainage for properties adjacent to the Main Airfield Parcel including the New Hamilton Partnership development, the eastern portion of the Coast Guard housing area, the Landfill 26 area, and Reservoir Hill.

There are no residential housing or developed recreational areas within the HAAF Main Airfield Parcel and adjacent coastal salt marsh. However, adjacent properties that were part of the larger HAAF, particularly to the west, have been, or are in the process of being, developed for residential and/or commercial uses.

Wetlands restoration on the portion of the Inboard Area and the adjoining abandoned antenna field that, together, constitute the wetland project area is consistent with and helps implement applicable local, regional, and state plans, including the Hamilton Reuse Plan, the City of Novato General Plan, and the San Francisco Bay Conservation and Development Commission San Francisco Bay Plan. There are three wetland project objectives that satisfy the above-mentioned plans: (1) to create a diverse array of wetland and wildlife habitats that benefit a number of threatened, endangered, and other species; (2) to reduce in-water disposal of dredged material and beneficially reuse dredged sediment as wetland cover materials, as feasible; and (3) to facilitate the base-closure and reuse process.

This ROD/RAP evaluates the need for remediation and the remedial alternatives at HAAF based on its beneficial use as wetlands. Under the future wetlands end use, the existing levee adjacent to the airfield will be breached, and water from San Pablo Bay would be allowed to reclaim the airfield, eventually returning the area to a tidal marsh. Because much of the Inboard Area has subsided to elevations below that of a productive salt marsh, the HWRP plans to raise the elevation of the inboard area by placing imported fill material augmented by natural sedimentation. Initially, main tidal channels will be constructed and lower-order channels will form naturally.

The initial construction phase of the wetlands restoration project is scheduled for approximately 5 to 8 years. Following construction, the levee will be breached and the wetlands will be allowed to equilibrate and mature. The wetland is expected to reach maturity approximately 30 years after levee breach.

Coastal Salt Marsh

The coastal salt marsh will continue to serve as a functioning salt marsh habitat in the future. This ROD/RAP evaluates the remedial alternatives based on beneficial use as

wetlands. Under the future-wetlands end-use project, the coastal salt marsh will remain a tidal wetland after remediation.

1.4.5 Existing Biological Communities

This section contains descriptions of habitats and biota currently existing within the HAAF Main Airfield Parcel and the adjacent coastal salt marsh. This summary is not intended to be an exhaustive compilation of plants and wildlife but, rather, a list of potential ecological receptors.

Several studies since 1986 have characterized the biological resources (flora and fauna) in the vicinity of the HAAF Main Airfield Parcel. The surveys were conducted in support of environmental impact reports for base closure and subsequent use of BRAC property. The discussions of biological resources in this section are based on reports by EIP Associates (1986 and 1993) and USACE (1994). Information in these reports includes results of botanical field surveys conducted in August 1993 and May 1994, and wildlife surveys conducted in May 1994.

Additional wildlife investigations were conducted in 1997 and 1998 and include the following:

- Bat survey (LSA, 1997a)
- *California Clapper Rail (Rallus longirostris obsoletus) and California Black Rail (Laterallus jamaicensis coturniculus) Survey* (LSA, 1998)
- *Burrowing Owl (Athene cunicularia) Study and Relocation* (LSA, 1997a)
- *Red-legged Frog (Rana aurora) Survey* (LSA, 1997b)

There are some differences among the various HAAF documents as to which special-status species, of those not actually observed on the property or salt marsh areas, are likely to be present. The *Hamilton Wetland Restoration Plan, Volume II: Final EIR/EIS* (JSA, 1998) lists 56 special-status species and evaluates their potential for occurrence, or reports documented observations. It is concluded from this information that after elimination of species for which habitat is lacking or species that may only incidentally use the site, 14 special-status species are known to occur or are assumed to use suitable habitat at the site. These species include:

- Longfin smelt (*Spirinchus thaleichthys*)
- Central California steelhead (*Oncorhynchus mykiss*)
- Central California Coast Coho salmon (*Oncorhynchus kisutch*)
- Chinook salmon (*Oncorhynchus tshawytscha*)
- Double-crested cormorant (*Phalacrocorax auritus*)
- California brown pelican (*Pelicanus occidentalis californicus*)
- California clapper rail
- California black rail
- Northern harrier (*Circus cyaneus*)
- White-tailed kite (*Elanus leucurus*)
- Burrowing owl
- Salt marsh common yellowthroat (*Geothlypis trichas sinuosa*)

- San Pablo song sparrow (*Melospiza melodia samuelis*)
- Salt marsh harvest mouse (*Reithrodontomys raviventris*)

The California Department of Fish and Game also indicated the coastal salt marsh is appropriate habitat for the Suisun Shrew (*Sorex ornatus sinuosus*).

Habitats in the Inboard Area consist primarily of upland habitat (grassland), paved and or landscaped areas. Within the Inboard Area, a portion of the site (approximately 0.25 acre) lies within Ignacio Reservoir, which is a wetland created as a mitigation measure. Ignacio Reservoir provides habitat for several species. In addition, a wildlife habitat was established at the northwest end of the site as wetland mitigation for destruction of habitat associated with the construction of a cap over Landfill 26. The Inboard Area (excluding Ignacio Reservoir) also provides habitat for the gopher snake (*Pituophis catenifer*), western fence lizard (*Sceloporus occidentalis*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), white-tailed kite (*Elanus leucurus*), northern harrier (*circus cyaneus*), American kestrel (*Falco sparverius*), California quail (*Callipepla californica*), ring-necked pheasant (*Phasianas colchicus*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), black-tailed jackrabbit (*Lepus bennettii*), desert cottontail (*Sylvilagus audubonii*), black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*). The western burrowing owl, a species of concern, has previously occurred in the Inboard Area and several individuals have been captured and relocated offsite. The seasonal wetlands provide foraging habitat for great egrets, (*Ardea alba*), red-winged blackbirds (*Agelaius phoeniceus*), shorebirds, killdeer (*Charadrius vociferus*), raccoon, and aquatic garter snakes (*Thamnophis* spp.). Coastal salt marsh and brackish marsh under tidal influence are located between the perimeter levee at the eastern end of the project area and the open water of San Pablo Bay (Figure 1-3). This habitat can be divided into three distinct zones, based on the frequency and duration of tidal inundation (Figure 1-5) (USACE, 2000):

- Low marsh is inundated daily and occupies the elevations between mean tide level and mean high water. In the project area, low marsh is adjacent to the open water of San Pablo Bay and is dominated by California cord grass (*Spartina foliosa*).

- Middle marsh habitat occupies the elevations between mean high water and mean higher high water and is dominated by common pickleweed (*Salicornia* sp). Middle marsh is predominant outboard of the perimeter levee and is inundated frequently throughout each month, although for shorter periods than low marsh.

- High transitional marsh habitat occupies the elevations between mean higher high water and the highest tide level; this habitat is inundated infrequently and for short periods. High marsh habitat occupies a narrow strip along the bay side of the levee and supports plant species that are tolerant of saline conditions, but have not adapted to frequent, long-term inundation, including salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), fat-hen salt plant (*Atriplex patula ssp hastata [A. triangularis]*), and gum plant (*Grindelia* sp). The tidal coastal salt marsh community provides food, cover, and breeding habitat for many wetland-dependent wildlife species. The dense vegetation and large invertebrate populations typically associated with salt marshes provide ideal nesting and foraging conditions for a variety of bird species including rails, egrets, herons, waterfowl, and shorebirds. In addition to being important habitat for wetland-associated wildlife, the salt marsh community is also a crucial component of the San Pablo Bay ecosystem, providing

species observed in this habitat include double-crested cormorant, great blue heron (*Ardea herodias*), great egret, American coot (*Fulica americana*), killdeer, northern harrier (*Circus cyaneus*), black rail, California clapper rail, and San Pablo song sparrow. Other species expected to use coastal salt marsh habitat include the longfin smelt, small fish, invertebrates, raccoon, suisun shrew (*Sorex ornatus sinuosus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), mallard (*Anas platyrhynchus*), sora (*Porzana carolina*), Virginia rail, the endangered California brown pelican (*Pelecanus occidentalis californicus*), salt marsh yellowthroat (*Geothlypis trichas sinuosa*), and willet (*Catoptrophorus semipalmatus*).

- Brackish marsh occurs along portions of the ODD. Because marsh vegetation associated with ditches occurs in narrow linear bands, these habitat areas typically support a lower diversity of wildlife than do larger, more contiguous units of brackish marsh. Drainage ditch banks and channels also provide foraging habitat and cover for species such as herons, egrets, and dabbling ducks, and movement corridors for striped skunks, raccoons, and other species.

1.5 Document Organization

This introduction has provided the background and purpose of the ROD/RAP, presented an overview of the property being addressed, and described the hydrogeological setting, ecological communities, and land uses of the property and sites.

The remainder of this document has been organized as follows:

Section 2 contains information regarding site background, risk assessment, action goals, remedial actions, remedial alternatives, and proposed actions for the Inboard Area sites.

Section 3 contains information regarding site background, risk assessment, action goals, remedial actions, remedial alternatives, and proposed actions for the coastal salt marsh.

Section 4 provides a summary of the proposed actions for sites located in both the Inboard Area and the coastal salt marsh.

Section 5 provides references for the ROD/RAP.

Appendices are as noted in the table of contents.

Tables and figures are provided following the primary sections in which they are cited. For example, tables and figures for Section 2.1 can be found following Section 2.1 text (with tables occurring first, followed by figures).

TABLE 1-1
Army BRAC Program Sites
Hamilton Main Airfield Parcel ROD/RAP

Inboard Area Sites
Revetment 18/Building 15
Building 20
Building 26
Building 35/39 Area
Building 41 Area
Building 82/87/92/94/Area (including storm drains)
Building 84/90
Building 86 (including storm drains)
East Levee Generator Pad
Former Sewage Treatment Plant (including sanitary and industrial waste lines)
Northwest Runway Area
Onshore Fuel Line • 54-inch-diameter storm drain segment • Northern segment • Hangar segment
Perimeter Drainage Ditch (PDD) • Lined outside HWRP-proposed channel cut • Lined within HWRP-proposed channel cut • Unlined
PDD Spoil Piles A, B, C, D, E, F, G, H, I, J, K, L, M, and N
Revetments 1 through 17 and 19 through 28 (including storm drains)
Tarmac East of Outparcel A-5
Coastal Salt Marsh Sites
Antenna Debris Disposal Area
Area 14
Boat Dock • Channel area • Nonchannel area
East Levee Construction Debris Disposal Area (including burn pit)
Former Sewage Treatment Plant Outfall
High Marsh Area • Proposed channel cut • Nonchannel cut
Historic Outfall Drainage Ditch
Outfall Drainage Ditch

TABLE 1-2
Action Goals
Hamilton Main Airfield Parcel ROD/RAP

Contaminant	Action Goals[a] (ppm)		Source[b]	
	Coastal Salt Marsh	Inboard Area	Coastal Salt Marsh	Inboard Area
Metals				
Arsenic	23	16.7	Site-Specific Sediment Ambient	BRAC Soils Ambient
Barium	188	190	Site-Specific Sediment Ambient	BRAC Soils Ambient
Beryllium	1.68	1.03	Site-Specific Sediment Ambient	BRAC Soils Ambient
Boron	71.6	36.9	Site-Specific Sediment Ambient	BRAC Soils Ambient
Cadmium	1.8	1.2	Site-Specific Sediment Ambient	ER-L
Chromium	149	112	Site-Specific Sediment Ambient	SF Bay Ambient
Cobalt	26.7	27.6	Site-Specific Sediment Ambient	BRAC Soils Ambient
Copper	88.7	68.1	Site-Specific Sediment Ambient	SF Bay Ambient
Lead	46.7	46.7	ER-L	ER-L
Manganese	1260	943	Site-Specific Sediment Ambient	BRAC Soils Ambient
Mercury	0.58	0.43	Site-Specific Sediment Ambient	SF Bay Ambient
Nickel	132	114	Site-Specific Sediment Ambient	BRAC Soils Ambient
Silver	1	1	ER-L	ER-L
Vanadium	136	118	Site-Specific Sediment Ambient	BRAC Soils Ambient
Zinc	169	158	Site-Specific Sediment Ambient	SF Bay Ambient
Semivolatile Organic Compounds (including PAHs)				
PAHs, total	4.022	4.022	ER-L	ER-L
Pentachlorophenol	0.017	--	HHERA—Marine Invertebrate	--
Phenol	0.13	--	HHERA—Marine Invertebrate	--
Petroleum Hydrocarbons				
TPH-dl/TPH-motor oil[c]	144	144	Presidio—Saltwater Ecological Protective Zone	Presidio—Saltwater Ecological Protective Zone
TPH-g/JP-4	12	12	Presidio—Saltwater Ecological Protective Zone	Presidio—Saltwater Ecological Protective Zone
Pesticides/Herbicides/PCBs/Dioxins				
BHCs, total	0.0048	--	Lindane AET (polychaete)	--
Chlordanes, total	0.00479	--	PEL	--
DDTs, total[d]	0.03	0.03	RART—California clapper rail	RART—California clapper rail
Dichlorprop	0.14	--	HHERA—California clapper rail	--
Endrin Aldehyde	0.0064[e]	--	HHERA—Marine Invertebrate	--
Heptachlor	0.0088[f]	--	HHERA—Marine Invertebrate	--

TABLE 1-2
Action Goals
Hamilton Main Airfield Parcel ROD/RAP

	Action Goals[a] (ppm)		Source[b]	
Contaminant	**Coastal Salt Marsh**	**Inboard Area**	**Coastal Salt Marsh**	**Inboard Area**
Heptachlor epoxide	0.0088	--	HHERA—Marine Invertebrate	--
MCPA	7.9[g]	--	HHERA—Marine Invertebrate	--
MCPP	3.0	--	PQL	--
Methoxychlor	0.09	--	HHERA—Marine Invertebrate	--
PCBs, total	0.09	--	HHERA—California clapper rail	--
Dioxins (Total TCDD TEQ)[h]	0.000021	--	EPA	--

NOTE: This is a comprehensive list of action goals. All action goals do not apply at each site. Site-specific action goals are discussed in Sections 2.2 and 3.2.

-- Not applicable

TCDD = tetrachlorodibenzo-p-dioxin
TEQ = toxicity equivalence

[a] If contamination above the action goals is found in the coastal salt marsh beyond those areas already identified as requiring remediation, the Army and State will determine whether additional or continued excavation is warranted by considering the potential risk to public health and the environment from the residual contaminants and the resulting habitat destruction.

[b] The sources of the action goals are:

- **Metals:** Background concentrations for metals were primarily used as action goals unless the background concentrations were less than available risk-based numbers. Site-specific ambient levels from Appendix A - U.S. Army, 2001, *Final Human Health and Ecological Risk Assessment*; Effects Range-Lows (ER-Ls) from Long, E. R, D. D. MacDonald, S. L. Smith, and F. D. Calder, 1995, "Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments," *Environmental Management*, 19:81-97; *San Francisco Bay RWQCB Staff Report: Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments*, May 1998.
- **Petroleum hydrocarbons:** *Report of Petroleum Hydrocarbon Bioassay and Point-of-Compliance Concentration Determinations; Saltwater Ecological Protection Zone; Presidio of San Francisco, California,* Dated December 1997. The numbers in this report were developed for a similar site with similar ecological receptors.
- **PAHs:** ER-Ls from Long, E.R, D.D. MacDonald, S.L. Smith, and F.D. Calder, 1995, "Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments," Environmental Management, 19:81-97. The ER-Ls were used as action goals because the ER-Ls are accepted as being protective of ecological receptors.
- **SVOCs**: US Army, 2001, *Final Human Health and Ecological Risk Assessment.*
- **Pesticides, Herbicides, PCBs, and Dioxins:** Table 5-1 from the US Army, 2001, *Final Human Health and Ecological Risk Assessment* (marine invertebrate—amphipod and California clapper rail); practical quantitation limits (PQLs) from previous sampling events were used when no other ecologically-based numbers were available with achievable detection limits; U.S. EPA, 1993a, *Interim Report on Data and Methods for Assessment of 2,3,7,8-Tetrachlorodibenzo-p-dioxin Risks to Aquatic Life and Associated Wildlife.* (EPA/600/R-93/-055); for lindane and total chlordane, Screening Quick Reference Tables (SQuiRTs), NOAA, updated September 1999 were used as the best available ecological number when no other references were available. The DDT values were developed in the Coastal Salt Marsh Focused Feasibility Study (CH2M HILL, 2003).

[c] The action goal for TPH diesel/TPH motor oil is also used as the action goal for UHE (unknown hydrocarbons extractable).

[d] The total DDT concentration in the Coastal Salt Marsh Area or Inboard Area shall not exceed 1.0 ppm. Areas with total DDT concentrations greater than 1.0 ppm shall be excavated and disposed of offsite.

[e] The goal for Endrin Ketone is used as a surrogate for Endrin Aldehyde.

[f] The goal for Heptachlor Epoxide is used as a surrogate for Heptachlor.

[g] The goal for 2,4,D is used as a surrogate for MCPA.

[h] Dioxin is only considered a COC at the ELCDDA Burn Pit.

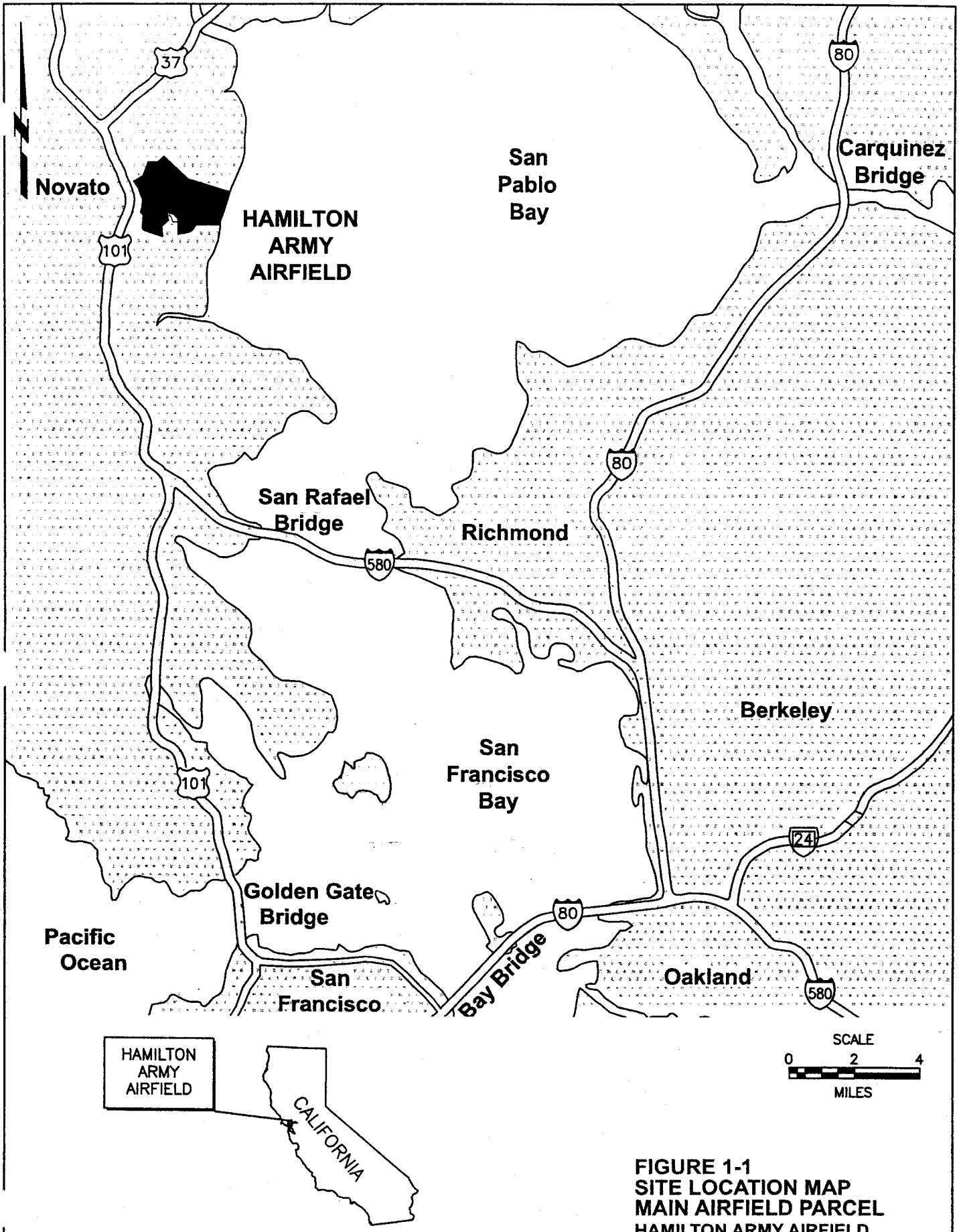

FIGURE 1-1
SITE LOCATION MAP
MAIN AIRFIELD PARCEL
HAMILTON ARMY AIRFIELD

ROD/RAP Reference: IT Corporation Figure 1-1 Site Location Map

CH2MHILL

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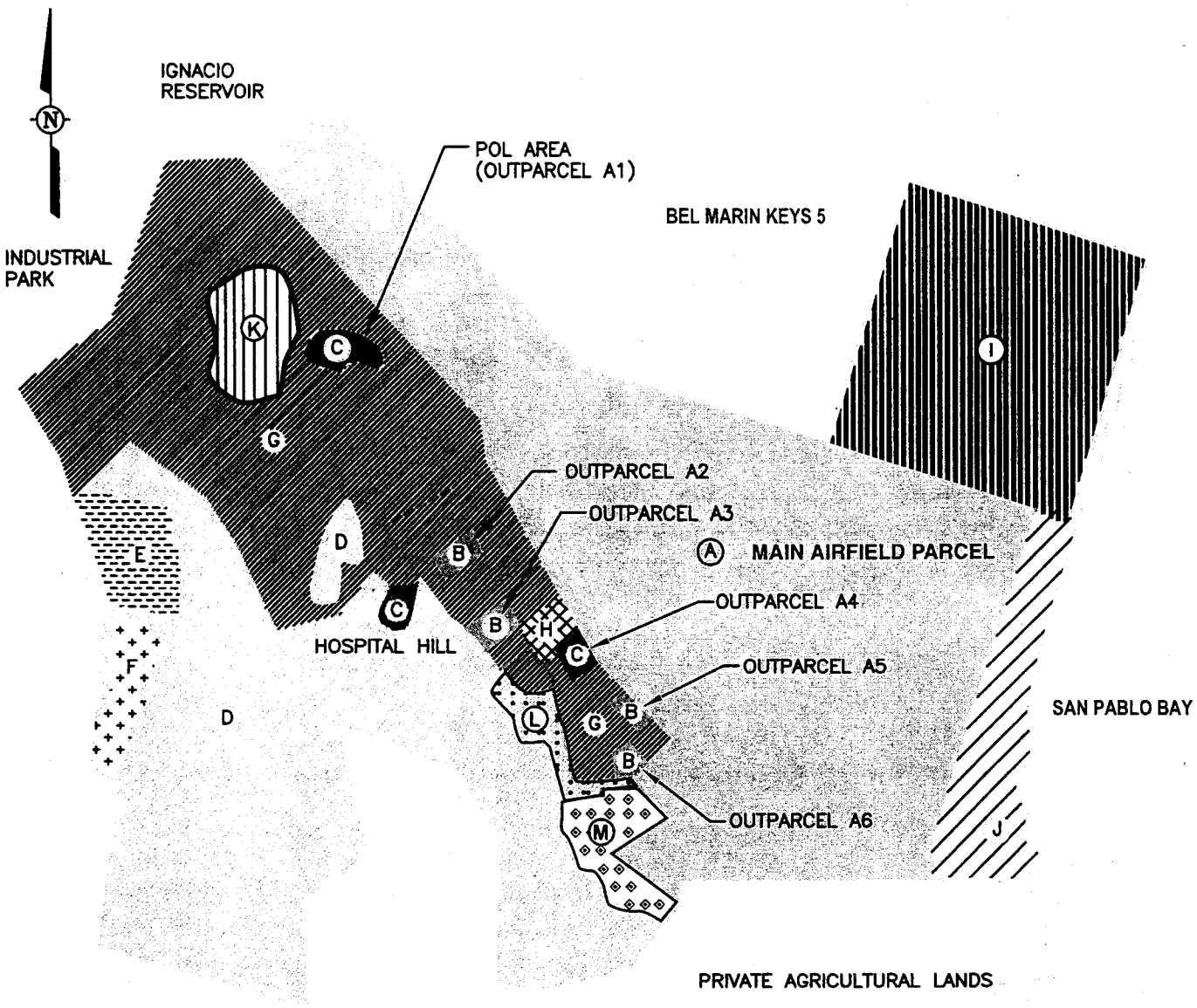

LEGEND

- (A) MAIN AIRFIELD PARCEL
- (B) FORMER BRAC PROPERTY TRANSFERRED
- (C) BRAC PROPERTY SUBJECT TO SEPARATE ENVIRONMENTAL REMEDIAL DOCUMENTATION
- (D) TRANSFERRED NAVY PROPERTY
- (E) LANHAM HOUSING
- (F) NOVATO SCHOOL DISTRICT
- (G) TRANSFERRED GSA SALE PARCEL
- (H) U.S. COAST GUARD
- (I) NORTH ANTENNA FIELD
- (J) STATE OF CALIFORNIA COASTAL SALT MARSH
- (K) GSA PROPERTY - LANDFILL 26
- (L) PUBLIC BENEFIT CONVEYANCE FROM THE NAVY TO THE CITY OF NOVATO
- (M) NAVY PROPERTY

APPROXIMATE SCALE

0 1000 2000 FEET

FIGURE 1-2
HAMILTON ARMY AIRFIELD PROPERTY LOCATION MAP

EBS
Reference: IT Corporation Figure 2-1, BRAC Property Location Map (DWG No. 762538-A96)

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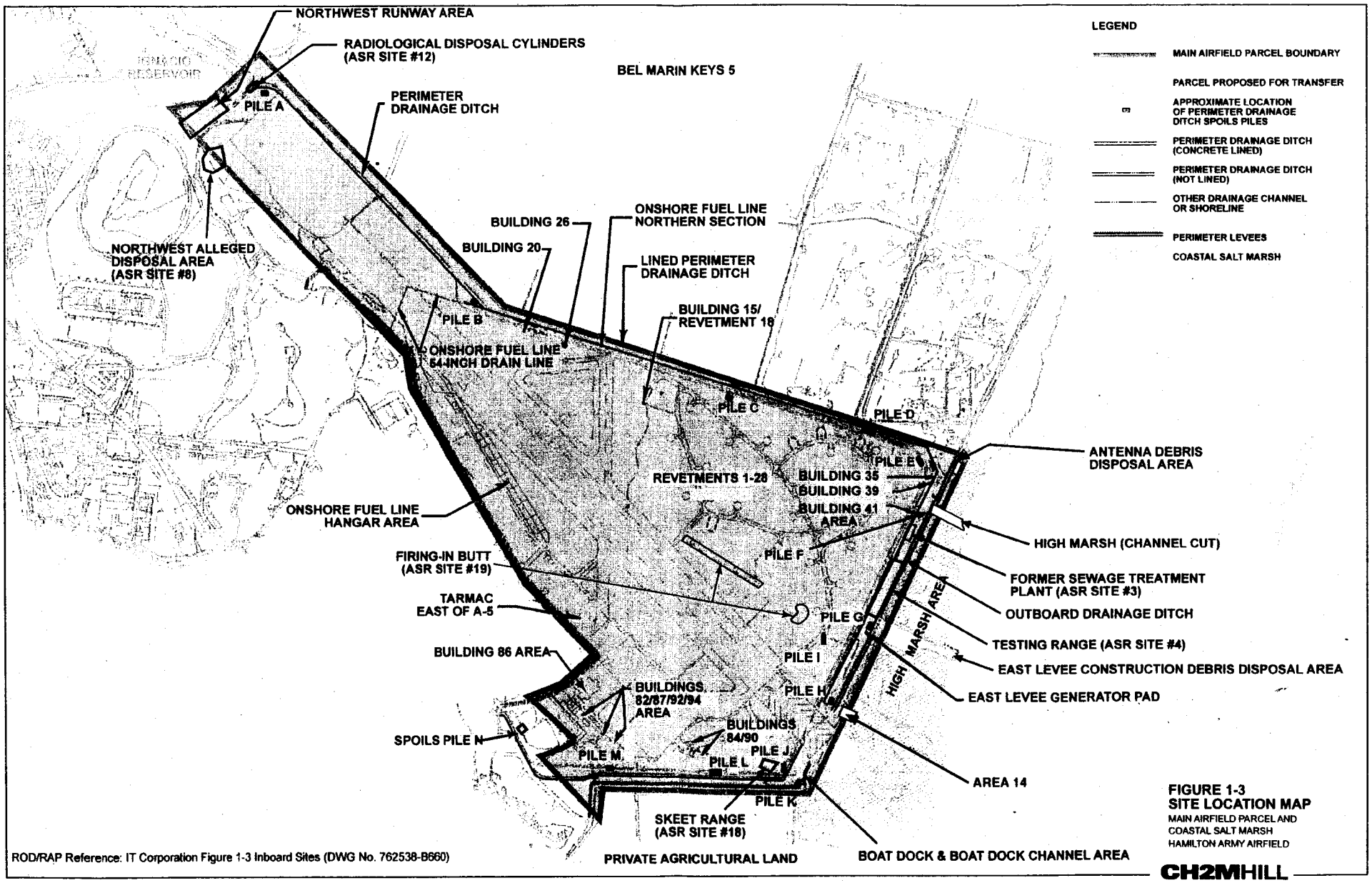

FIGURE 1-3
SITE LOCATION MAP
MAIN AIRFIELD PARCEL AND COASTAL SALT MARSH
HAMILTON ARMY AIRFIELD

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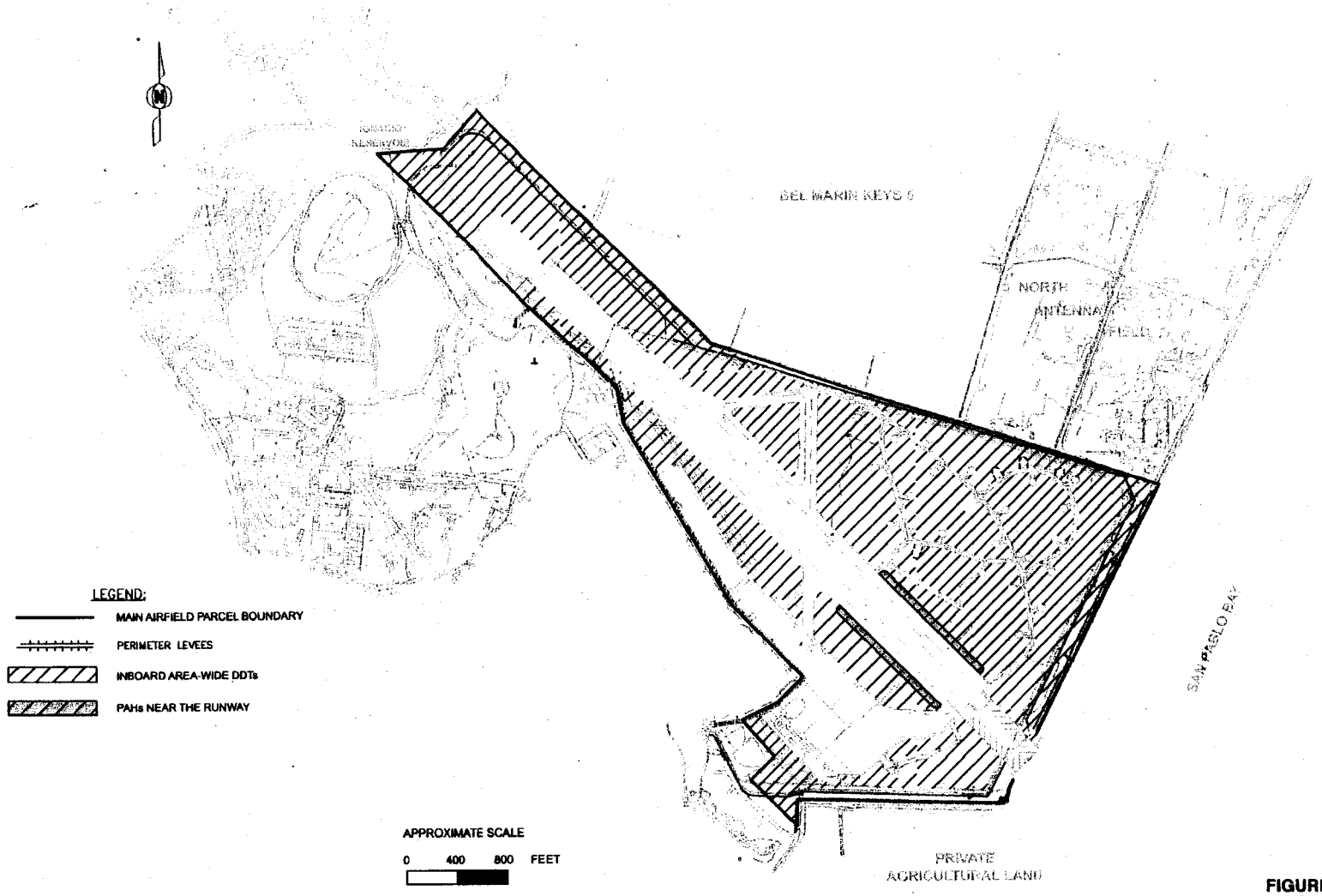

FIGURE 1-4
INBOARD AREA-WIDE DDTs AND PAHs NEAR THE RUNWAY MAIN AIRFIELD PARCEL
HAMILTON ARMY AIRFIELD

ROD/RAP Reference: IT Corporation Figure 1-3 Inboard Sites (DWG No. 762538-B660)

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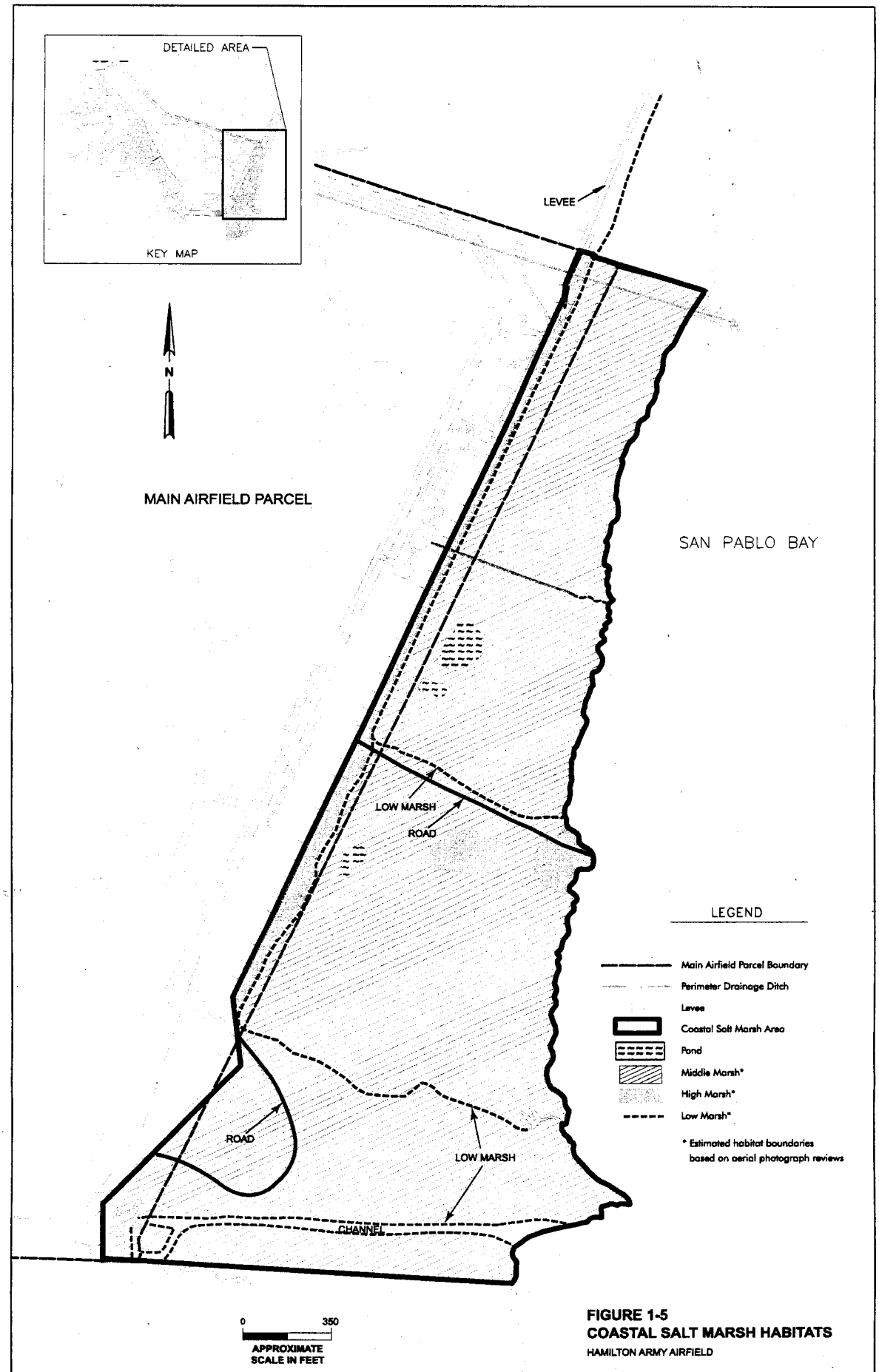

FIGURE 1-5
COASTAL SALT MARSH HABITATS
HAMILTON ARMY AIRFIELD

ROD/RAP

CH2MHILL

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