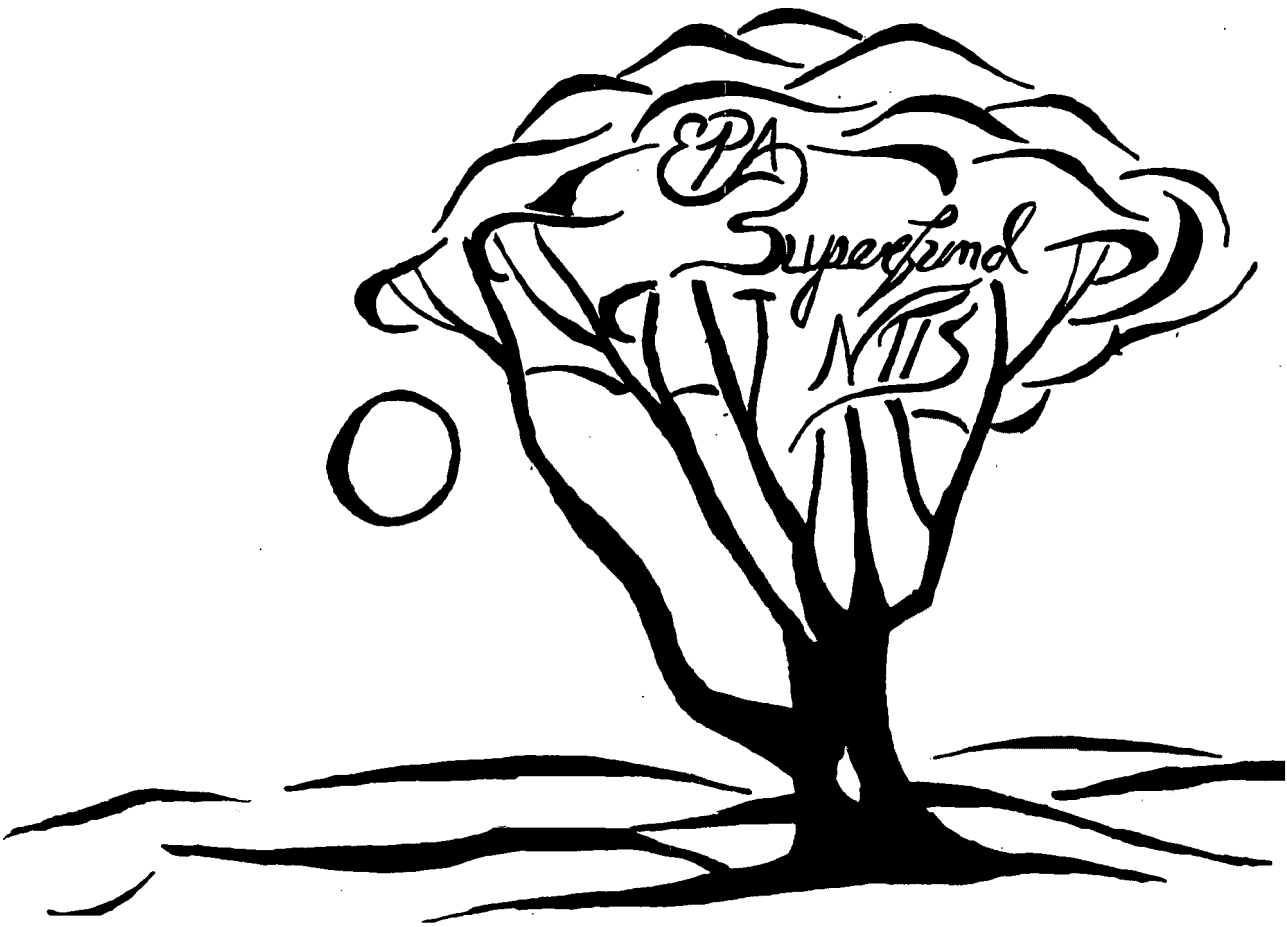
PB94-964069
EPA/ROD/R04-94/203
January 1995

EPA Superfund Record of Decision:

USAF Homestead AFB, (O.U.3), (Site SS-13), FL 9/16/1994



Homestead Air Force Base, Florida
Operable Unit 3
Site SS-13, PCB Spill Area

Declaration for the Record of Decision

DECLARATION

FOR THE

RECORD OF DECISION

SITE NAME AND LOCATION

Homestead Air Force Base
Homestead, Dade County, Florida
Operable Unit No. 3 - Site SS-13
PCB Spill Area (Former Site SP-3)

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the PCB Spill Area (Site SS-13) Operable Unit No. 3, at Homestead Air Force Base, in Homestead, Florida. The selected remedial action is chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this site.

The State of Florida, the U.S. Environmental Protection Agency (USEPA), and the U.S. Air Force (USAF) concur with the selected remedy presented in this Record of Decision (ROD).

DESCRIPTION OF THE SELECTED REMEDY

No action.

DECLARATION STATEMENT

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to remedial action, and is cost-effective. This remedy utilizes permanent solutions to the

maximum extent practicable for this site. Because the previous removal/remedial action at this site did not result in the implementation of engineering or institutional controls to prevent unacceptable exposures from hazardous substances and because this remedy will not result in hazardous substances remaining on site above health-based levels, the five-year review will not apply to this action.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: _____ Date: Oct. 28, '94
Dr. James Crane

UNITED STATES AIR FORCE
HOMESTEAD AIR FORCE BASE

By: _____ Date: Sep 16, 94
Mr. Alan Olsen
Director, HQ AFBCA-DR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

SEP 16 1994

4WD-FFB

Certified Mail
Return Receipt Requested

Mr. Alan Olsen
AFBCA/DR
1700 North Moore Street, Suite 2300
Arlington, Virginia 22209-2802

SUBJ: Record of Decision for Operable Unit 3, PCB Spill Area
Homestead Air Force Base, Florida

Dear Mr. Olsen:

The U.S. Environmental Protection Agency (EPA) Region IV has reviewed the above referenced decision document and concurs with the No Action Record of Decision for Operable Unit 3, PCB Spill Area, as supported by the previously approved Remedial Investigation and Baseline Risk Assessment Reports.

The selected remedy is one of "No Further Action". This action is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action and is cost effective.

It is understood that the selected remedy for Operable Unit 3 is the final remedial action to address all media potentially affected by past disposal practices at this unit.

Sincerely,

Patrick M Bond for

John H. Hankinson
Regional Administrator

cc: Mary Bridgewater, Air Force Base Conversion Agency
Robert Johns, Dade County Environmental Resources Management
Eric Nuzie, Florida Department of Environmental Protection
Humberto Rivero, Air Force Base Conversion Agency, Operating Location Y (Homestead Air Reserve Base)

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 2, 1994

Mr. Alan K. Olsen, Director
Air Force Conversion Agency
1700 N. Moore Street, Suite 2300
Arlington, Virginia 22209-2802

Dear Mr. Olsen:

The Florida Department of Environmental Protection agrees with the Air Force's selected alternative for Operable Unit 6 (Site SS-13), PCB Spill Area at Homestead Air Force Base.

The Record of Decision specifies that the No Action Alternative at Site SS-13 is a cost effective remedy and provides adequate protection of public health, welfare, and the environment from PCB-related contamination. Note, a subsequent investigative effort to address inorganic constituents found at Site SS-13 will be performed under the scope of a Remedial Investigation for Site SS-7 (Entomology Storage Area) located southwest of Site SS-13. The determination of closing Site SS-13 so that further investigation proceeds under the scope of Site SS-7 is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act and the National Contingency Plan (40 CFR 300).

In accordance with CERCLA as amended by SARA, the site will undergo a five-year review with the costs of the review to be absorbed by the Air Force.

We appreciate your continued cooperation and look forward to an expeditious economic and environmental recovery of Homestead Air Force Base.

Sincerely,

Virginia B. Wetherell
Secretary

VBW/jrc

Homestead Air Force Base, Florida
Operable Unit 3
Site SS-13, PCB Spill Area

Decision Summary for the Record of Decision

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DECISION SUMMARY

FOR THE

RECORD OF DECISION

1.0 SITE NAME, LOCATION, AND DESCRIPTION

Homestead AFB is located approximately 25 miles southwest of Miami and 7 miles east of Homestead in Dade County, Florida (Figure 1-1). The main Installation covers approximately 2,916 acres with easements constituting an additional 429 acres. The land surface at Homestead AFB is relatively flat, with elevations ranging from approximately 5 to 10 feet above mean sea level (msl).

Homestead Army Air Field, a predecessor of Homestead AFB, was activated in September 1942, when the Caribbean Wing Headquarters took over the air field previously used by Pan American Air Ferries, Inc. The airline had developed the site a few years earlier and used it primarily for pilot training. Prior to that time, the site was undeveloped.

Initially, Homestead Army Air Field served as a staging facility for the Army Transport Command, which was responsible for maintaining and dispatching aircraft to overseas locations. In 1943, the field mission was changed when the Second Operational Training Unit was activated to train the transport pilots and crews.

In September 1945, a severe hurricane caused extensive damage to the air field. Both the high cost of rebuilding the field and the anticipated post-war reductions in military activities led to the base being placed on an inactive status in October 1945. The base property was turned over to Dade County, which retained possession of it for the next 8 years. During that time, the base was managed by the Dade County Port Authority. The runways were used by crop dusters and the buildings housed a few small industrial and commercial operations.

In 1953, the federal government again acquired the Homestead Base, together with some surrounding property, and over the next 2 years rebuilt it as a Strategic Air Command (SAC) base. The first operational squadron arrived at Homestead AFB in February 1955, and the base was formally reactivated in November of the same year. Except for a short

period during 1960, when modifications were made to accommodate B-52 aircraft, the base remained an operational SAC base until 1968.

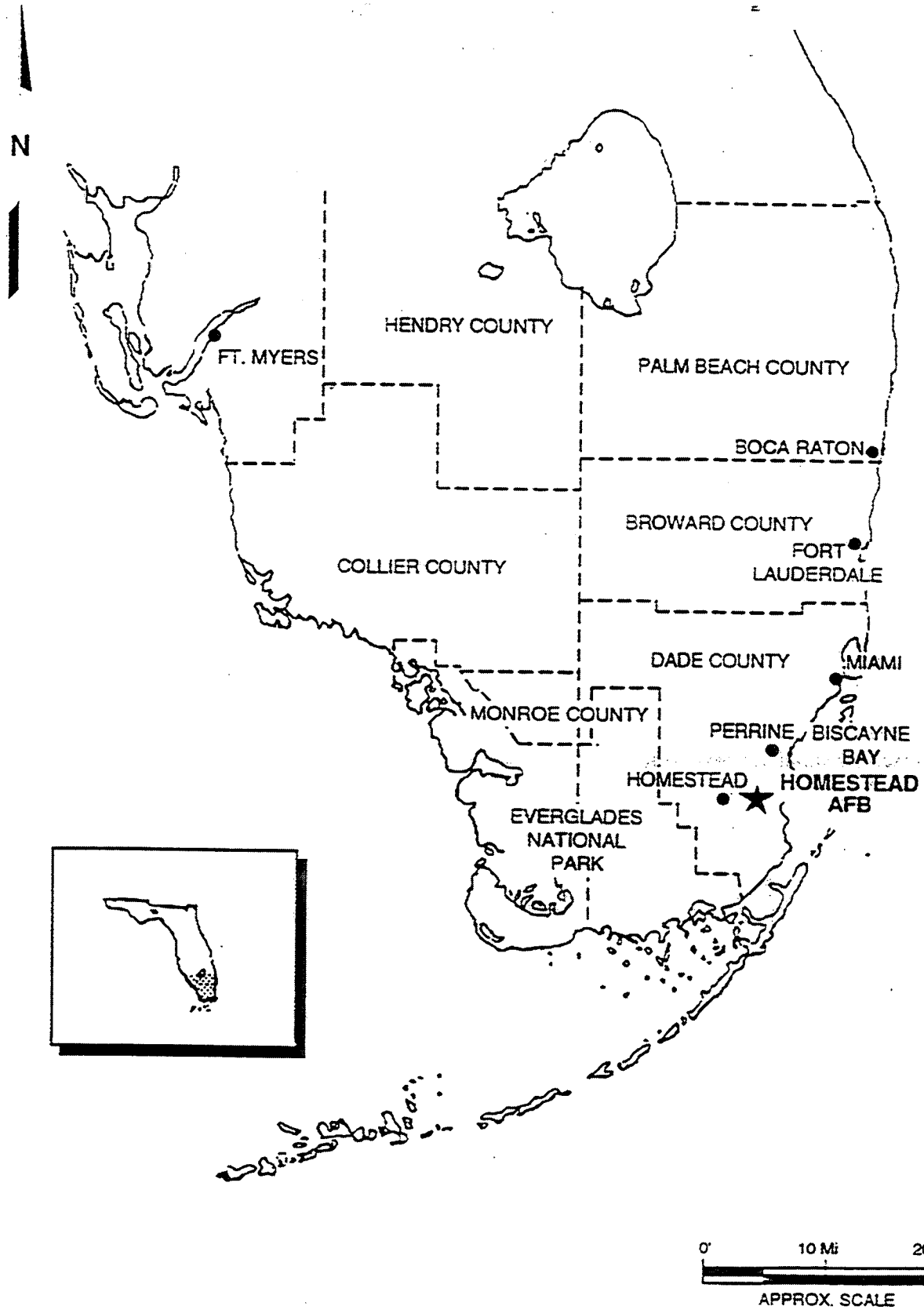
The command of Homestead AFB was changed from SAC to the Tactical Air Command (TAC) in July 1968, and the 4531st Tactical Fighter Wing (TFW) became the new host unit. F-100 C's and D's were flown there during this time. When the 31st TFW returned from Southeast Asia during October 1970, the designation 4531st TFW was deactivated and the 31st TFW became the host unit for Homestead AFB, flying F-4 D's and E's. In 1981, the 31st TFW was redesignated the 31st Tactical Training Wing (TTW). In October 1984, the base was converted to the 31st TFW and is currently home to F-16 aircraft. One tenant organization still flies F-4 aircraft. The Base was transferred to HQ Air Combat Command (HQ/ACC) on June 1, 1992.

In August 1992, Hurricane Andrew struck south Florida causing extensive damage to the Base. Military activities are currently minimized while the future of the base is considered. No other activities or tenants presently occur at the site. The majority of the Base housing area is unoccupied with only essential base security and maintenance personnel currently housed at the site. There are approximately 100 U.S. Air Force employees living in temporary base housing. No families are presently housed at the Base. The Base is presently on the Base Realignment and Closure (BRAC) list slated for realignment with a reduced mission.

1.1 SITE DESCRIPTION

Operable Unit No. 3, identified as Site SS-13 (Operable Unit No. 3 or Site SS-13) is located immediately behind Building 220, located within the Civil Engineering Storage Compound. The Civil Engineering Storage Compound, Site SS-13 occupies approximately 0.5 acres in the west-central portion of Homestead AFB (Figure 1-2). This storage compound is bordered by Westover Avenue to the east which is paved and oriented north/south; a drainage canal to the west; open land to the south; and storage for large military trucks and equipment to the north. East of the site and west of Westover Avenue is an auto shop work yard.

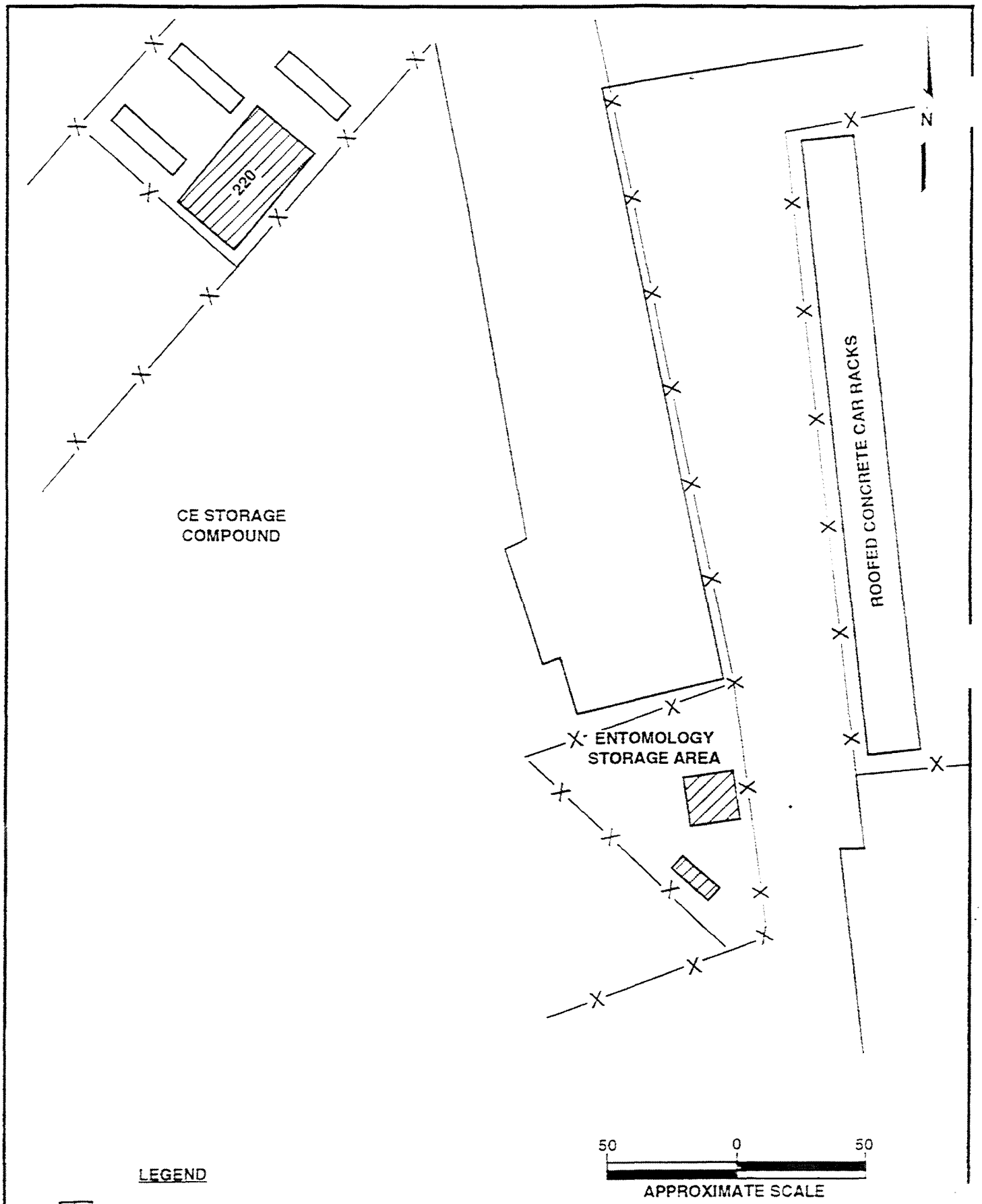
The Civil Engineering Storage Compound was established as a storage area in the late 1960's and early 1970's. Miscellaneous materials such as lumber, piping, air handlers, cable, conduit, and transformers were stored there. The area was not fenced until the mid 1970's and early 1980's. Building 220 was used to store plumbing and electrical fittings



HOMESTEAD AIR FORCE BASE
HOMESTEAD, FLORIDA

LOCATION OF
HOMESTEAD AIR FORCE BASE

FIGURE 1-1



HOMESTEAD AIR FORCE BASE
FLORIDA

SITE LOCATION MAP
PCB SPILL AREA, SITE SS-13

FIGURE 1-2

that needed weather protection. Prior to Hurricane Andrew in August 1992, the storage compound was utilized to store items such as old military jeeps, solar water heating equipment, dumpsters, non-PCB containing transformers, razor wire, lumber, air handlers, cable, conduit, and assorted steel pipe. Presently, only the steel frame and concrete foundation remain at Building 220 and the compound is used to store salvageable hurricane remnants such as refrigerators, stoves, and miscellaneous appliances. The site surface is primarily weathered limestone.

1.2 LAND USE

The area adjacent to Homestead AFB including Site SS-13, to the west, east, and south within a half-mile radius is primarily composed of farmland and plant nurseries. Residential areas are located within a half-mile to the north and southwest of the Base. Woodlands are located approximately one-half-mile east of the facility and mangroves and marsh occur adjacent to Biscayne Bay. The Biscayne National Park is located 2 miles east of Homestead AFB; the Everglades National park is located 8 miles west-southwest of the Base; and the Atlantic Ocean is approximately 8 miles east of the Base.

1.3 SURFACE HYDROLOGY

Surface hydrology at Homestead AFB, including Site SS-13 is controlled by five main factors: 1) relatively impermeable areas covered by runways, buildings and roads; 2) generally high infiltration rates through the relatively thin layer of soil cover; 3) flat topography; 4) generally high infiltration rates through the outcrop locations of the Miami Oölite Formation; and 5) relatively high precipitation rate compared to evapotranspiration rate. Infiltration is considered to be rapid through surfaces of oölite outcrop and areas with a thin soil layer. Infiltration rates are accelerated by fractures within the oölite, as well as naturally occurring solution channels. Precipitation percolates through the relatively thin vadose zone to locally recharge the unconfined aquifer.

Natural drainage is limited because the water table occurs at or near land surface. The construction of numerous drainage canals on Homestead AFB has improved surface water drainage and lowered the water table in some areas. Rainfall runoff from within Homestead AFB boundaries is drained via diversion canals to the Boundary Canal. A dike is present along the outside of the bank of the Boundary Canal to prevent runoff

from outside the property from entering the canal. As can be observed in Figure 1-3, the Boundary Canal surrounds all but a portion of the facility property at the northernmost end.

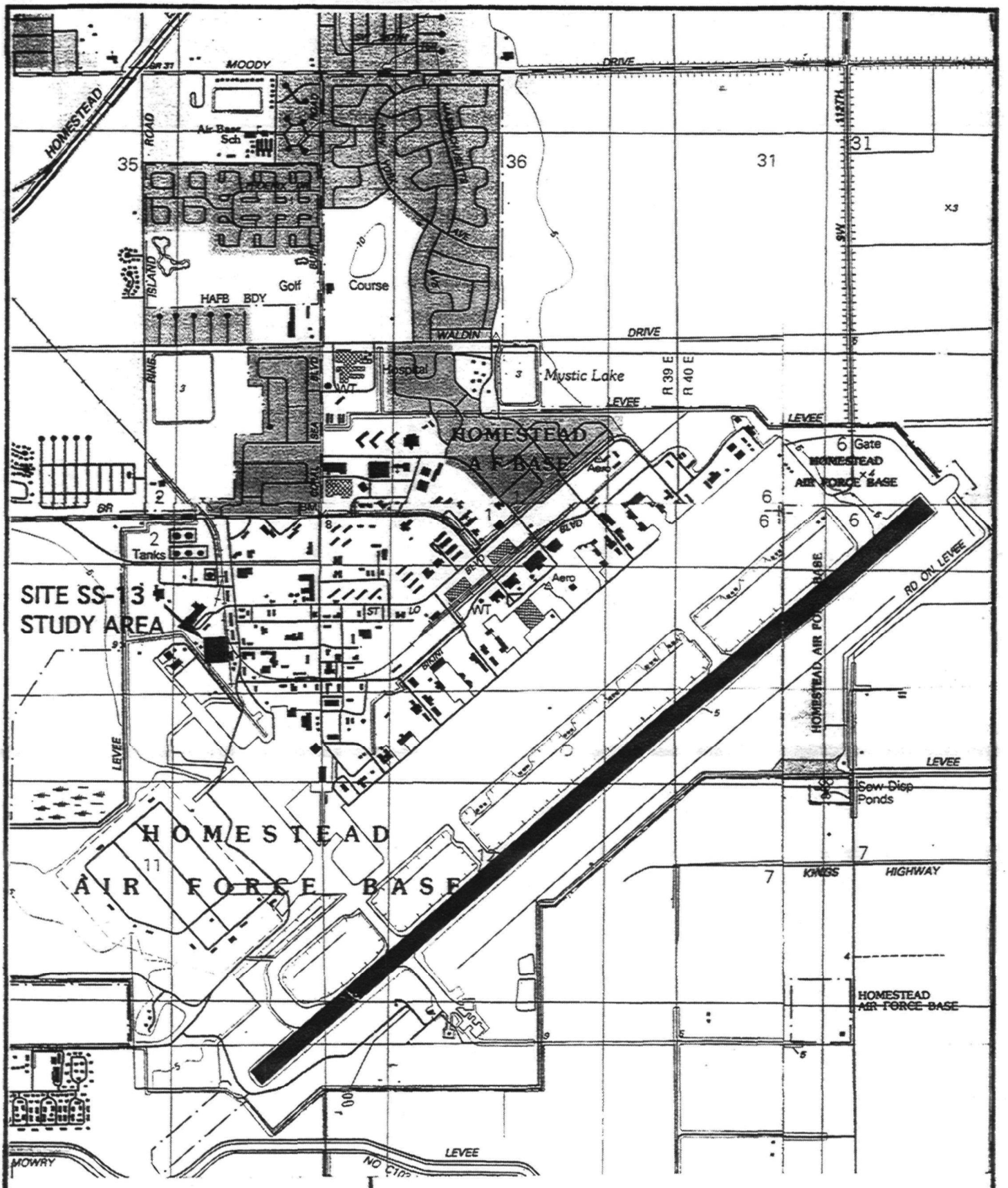
A drainage divide occurs within the Homestead AFB facility property, running from the northern end of the facility, toward the center. Water in the Boundary Canal flows generally south and east along the western boundary of the property, and south along the eastern boundary, converging at a storm-water reservoir located at the southeastern corner of the Base. Flow out of the stormwater reservoir flows into Military Canal, which, in turn, flows east into Biscayne Bay, approximately 2 miles east of the Base. Water movement is typically not visible in the canals in dry weather due to the lowered water table and the very low surface gradient (0.3 feet per mile) that exists at the Base. The drainage canal, located approximately 300 ft west of the PCB Spill Area, is not a likely receptor of groundwater or surface water from Site SS-13 given that the groundwater flow is typically to the southeast and a concrete retaining wall paralleling the canal restricts surface water from entering the canal.

1.3.1 Hydrogeologic Setting

The regional hydrogeology in the southeast Florida area consists of two distinct aquifers: the surficial aquifer system, which consists of the Biscayne Aquifer and the Grey Limestone Aquifer, and the Floridan Aquifer.

Biscayne Aquifer. The Biscayne Aquifer at Homestead Air Force Base consists of the Miami Oölite, Fort Thompson Formation, and the uppermost part of the Tamiami Formation. In general, the most permeable parts of the aquifer lie within the Miami Oölite and the Fort Thompson Formation.

The Biscayne Aquifer underlies all of Dade, Broward, and southeastern Palm Beach Counties. It is wedge-shaped, thinning to the west beneath the Everglades and thickening to the east along the coast. The Biscayne Aquifer is the sole source of potable water in Dade County and is a federally-designated sole-source aquifer pursuant to Section 1425 of the Safe Drinking Water Act (SDWA). The Biscayne Aquifer supplies drinking water to approximately 2.5 million people within local communities. Within 3 miles of Homestead AFB, an estimated 1,600 people obtain drinking water from the Biscayne Aquifer and 18,000 acres of farmland are irrigated from wells (USEPA, 1990). All



Source: USGS 7.5 minute Topographic Quadrangles Arsenicker, Homestead, Goulds, and Perrine.

HOMESTEAD AIR FORCE BASE HOMESTEAD, FLORIDA
BASE LOCATION MAP
FIGURE 1-3

H8AFB Base Map

recharge to the aquifer is derived from local rainfall, part of which is lost to evaporation, transpiration, and runoff.

The high permeability of the formations that comprise the Biscayne Aquifer is attributed to secondary solution features created by percolating groundwaters. The solution cavities occupy a significant volume of the oölitic limestone and are commonly filled with fine to medium-grained sand, causing the limestone to have high horizontal and vertical permeabilities. It is the high vertical permeability that permits rapid infiltration of rainfall to the groundwater. During precipitation events, the dominant movement of groundwater is toward the open canals, limiting mixing to the shallow portion of the aquifer. The lower massive limestone unit also has well developed secondary permeability, through caverns as large as several feet in diameter. Because of the extremely high permeability of this limestone, all large-capacity wells are completed in this part of the aquifer. The cavernous section generally does not contain loose sand.

In general, the Biscayne Aquifer has hydraulically interconnected groundwater flow with fluid potentials at all depths closely related to the water table (Sonntag, 1987). The aquifer is characterized by interconnected zones of cavernous limestone and, in the Homestead area, has reported transmissivities ranging from approximately 4 to 8 million gallons per day per foot (mgd/ft) (Allman et al., 1979).

Water-table contours indicate that under natural conditions, groundwater flows southeasterly toward Biscayne Bay. The hydraulic gradient is approximately 0.3 ft/mile. The water table at Homestead AFB generally is encountered within 5 to 6 feet of land surface, but may occur at or near land surface during the wet season (May to October). Fluctuations of groundwater levels and local variations in the direction of groundwater flow are due to several factors: (1) differences in infiltration potential, (2) runoff from paved areas, (3) water-level drawdown near pumping wells, (4) significant but localized differences in lithology (e.g., silt-filled cavities) and (5) drainage effects of canals and water-level control structures.

Average annual recharge to the Biscayne Aquifer ranges from 37 to 38 inches. The mean annual precipitation range is 58 to 64 inches. Evapotranspiration accounts for 20 in/yr of discharge from the aquifer. Runoff to the sea comprises 15.5 in/year, and pumping accounts for approximately 3.7 in/yr of groundwater discharge in Dade County.

Floridan Aquifer. Underlying the low-permeability sediments of the Tamiami Formation and Hawthorn Group are the formations which constitute the Floridan Aquifer.

The Floridan Aquifer is made up of limestones and dolomites. It is under artesian pressure and water levels in deep wells may rise 30 to 40 ft above ground surface. Groundwater within these Miocene and Eocene age formations tends to contain dissolved constituents at levels significantly above those recommended for drinking water. In view of the poor water quality and the depth of water yielding zones (800 to 900 feet bgs), the Floridan Aquifer is of limited usefulness as a source of potable water supply in the study area.

1.4 SITE GEOLOGY AND HYDROGEOLOGY

The stratigraphy of the shallow aquifer system as determined from soil borings performed during site investigations by Geraghty & Miller (G&M) and Montgomery Watson consists of a surficial weathered Miami Oölite ranging in depth from 2 to 6 feet bgs. The weathered limestone consists of a white to brown semi-consolidated oölitic limestone. This strata is underlain by consolidated to semi-consolidated oölitic and coral limestone interbedded with coarse to fine sand and clayey sand layers and lenses down to the total depth of borings (approximately 40 feet bgs). The land surface at Site SS-13 appears to be limestone gravel fill.

The Biscayne Aquifer is one of the most transmissive aquifers in the world. It underlies Homestead AFB. A thin vadose zone, nominally less than 5 feet deep, overlays the groundwater table at the site. As previously stated, the aquifer structure is a calcium carbonate matrix. This lithology is known to have natural concentrations of target analyte list (TAL) metals. In descending order by concentration, calcium, aluminum, iron magnesium, sodium, and potassium can be considered the primary metals of carbonate rock. The other TAL metals occur in trace concentrations, less than 50 milligrams per kilogram (mg/kg). The range and the standard deviations are not provided at this time. It should be expected that, as precipitation infiltrates and recharge takes place, leaching of metal ions from the weathered vadose zone and shallow unsaturated zone occurs. Regional data collected suggest that concentrations of trace metals can be expected to be the greatest in the shallow portion of the aquifer because of the proximity to the source (i.e. the weathering vadose structure) and the decreasing retention time with decreasing depth of the saturated zone. These observations support a hydrogeologic model in which the shallow portion of the aquifer has a greater horizontal transmissivity

than the vertical component during recharge events. However, it is not possible from the available data at the site to quantitatively differentiate horizontal and vertical components of the aquifer's hydrologic conductivity. The possible presence of vertical solution zones is well documented in literature. The site-specific effects have not been fully investigated. Nevertheless, the available data does not lead to the immediate conclusion that this is a necessary task. The conceptual model that the shallow groundwater is discharging at the local swell and ditches is valid for the purpose of discussing Site SS-13.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 HISTORY

2.1.2 Past Site Usage

The site history of the Civil Engineering Storage Compound, including Site SS-13, has been incompletely documented and historical records are sparse. In the past, the area stored transformers containing polychlorinated biphenyl (PCB) fluids. In 1981, a spill of PCB-contaminated (greater than 50 and less than 500 mg/kg PCB) transformer fluid occurred immediately southeast of Building 220 in the Civil Engineering Storage Compound (Figure 1-2). Less than 100 gallons of fluid was involved. Following the incident, the impacted soil was reportedly analyzed and found to contain less than 50 ppm of PCBs. Sometime prior to 1983, the soil was removed and disposed of at an off-base site. The following information is not available for the site:

- Name of responder
- Dates of response
- Exact area, volume, and location of material removed from the site
- The chemical characterization of the material removed
- The final disposition, manifest, of the material removed
- Confirmatory samples of the bottom of the excavation
- Origin, type and volume of fill brought to the site

2.2 ENFORCEMENT HISTORY

2.2.1 CERCLA Regulatory History

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) established a national program for responding to releases of hazardous substances into the environment. In anticipation of CERCLA, the Department of Defense (DOD) developed the Installation Restoration Program (IRP) for response actions for potential releases of toxic or hazardous substances at DOD facilities. Like the Environmental Protection Agency's (EPA's) Superfund Program, the IRP follows the procedures of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Homestead AFB was already engaged in the IRP Program when it was placed on the National Priorities List (NPL) in August 30, 1990. Cleanup of DOD facilities is paid for by the Defense Environmental Restoration Account (DERA), which is DOD's version of Superfund.

The Superfund Amendment and Reauthorization Act (SARA), enacted in 1986, requires the federal facilities follow NCP guidelines. The NCP was amended in 1990 (see 40 CFR 300 et seq.) to implement CERCLA under SARA. In addition, SARA requires greater EPA involvement and oversight of Federal Facility Cleanups. On March 1, 1991, a Federal Facility Agreement (FFA) was signed by Homestead AFB, the EPA, and the Florida Department of Environmental Protection (FDEP). The FFA guides the remedial design/ remedial action (RD/RA) process.

Also in response to SARA was a revision of EPA's *Guidance on Remedial Investigations Under CERCLA* (EPA, 1985a) and *Guidance on Feasibility Studies Under CERCLA* (EPA, 1985b). The revised document entitled *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988), released in October 1988 in Interim Final form, reflects the provisions of SARA as well as EPA's experience from previous Remedial Investigation/Feasibility Study (RI/FS) projects.

As part of the RI/FS process, Homestead AFB has been actively involved in the Installation Restoration Program (IRP) since 1983 and has identified 27 Potential Sources of Contamination (PSCs). Nine sites are currently being investigated under the RI/FS stage of CERCLA; ten sites are being investigated in the Preliminary Assessment/Site Investigation (PA/SI) stage of CERCLA; one site is being investigated under the Resource Conservation and Recovery Act (RCRA) guidelines; and seven sites are being

investigated under the FDEP petroleum contaminated sites criteria (Florida Administrative Code 17-770). The following PSCs are currently being investigated according to the CERCLA RI/FS guidelines:

FT-5	-	Fire Protection Training Area 2
OT-11	-	Residual Pesticide Disposal Area
SS-13	-	PCB Spill C.E. Storage Compound
SS-8	-	Oil Leakage Behind the Motor Pool
WP-1	-	Electroplating Waste Disposal Area
SS-3	-	Aircraft Washrack Area
SS-7	-	Entomology Storage Area
FT-4	-	Fire Protection Training Area 3
SD-27	-	Boundary Canal/Military Canal

As previously mentioned, on March 1, 1991, Homestead Air Force Base entered into a FFA with the USEPA and the Florida Department of Environmental Regulation (FDER) (agency is now named Florida Department of Environmental Protection [FDEP]). The purpose of this agreement was to establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at Homestead AFB in accordance with existing regulations. The FFA requires the submittal of several primary and secondary documents for each of the operable units at Homestead AFB. This ROD concludes all of the RI/FS requirements for Site SS-13 and selects a remedy for Operable Unit No. 3.

2.3 INVESTIGATION HISTORY

2.3.1 IRP Phase I - Record Search

An IRP Phase I - Records Search was performed by Engineering Science, and is summarized in their report, dated August 1983 (Engineering Science, 1983). During the Phase I study, sites with the potential for environmental contamination resulting from past waste disposal practices were identified. Thirteen sites of potential concern were identified by reviewing available installation records, interviewing past and present Homestead AFB employees, inventorying wastes generated and handling practices, conducting field inspections, and reviewing geologic and hydrogeologic data. In general, Phase I studies are used to determine if a site requires further investigation.

The thirteen sites identified were ranked using the Hazard Assessment Rating Methodology (HARM) developed by JRB Associates of McLean, Virginia, for the USEPA. HARM was later modified for application to the Air Force IRP. The following factors are considered in HARM: (1) the possible receptors of the contaminants; (2) the characteristics of the waste; (3) potential pathways for contaminant migration; and (4) waste management practices. HARM scores for the sites ranked at Homestead AFB ranged from a high of 72 to a low of 7 out of 100. Eight of the 13 sites were determined to have a moderate to high contamination potential, one of which was the Site SS-13 PCB Spill Area.

The IRP Phase I Report evaluated the PCB Spill, Civil Engineering Compound (Site SS-13) and assigned the lowest HARM score of 7 based on criteria listed above and the reported removal of the contaminated soil from the area.

2.3.2 IRP Phase II - Confirmation/Quantification

An IRP Phase II study was performed by Science Applications International Corporation, and was reported on in March 1986 (SAIC, 1986). Based on the low HARM score and the prior removal of the contaminated soil, Site SS-13 was excluded from this study phase.

2.3.3 IRP Phase III - Technology Base Development

The IRP Phase III is a research phase and involves technology development for an assessment of environmental impacts. There have been no Phase III tasks conducted at the Base to date.

2.3.4 IRP Phase IV - Additional Investigations

The IRP Phase IV investigations consist of two areas of work activity. Phase IV-A involves additional site investigations necessary to meet the Phase II objectives, a review of all management methods and technologies that could possibly remedy site problems, and preparation of a baseline risk assessment to address the potential hazards to human health and the environment associated with the constituents detected at the site. Detailed alternatives are developed and evaluated and a preferred alternative is selected. The preferred alternative then is described in sufficient detail to serve as a baseline document for initiation of Phase IV-B.

Although an IRP Phase IV-A investigation was not conducted at Site SS-13, a Phase IV-A investigation was conducted in 1988 at the adjacent Site SS-2 (POL Bulk Fuel Storage Area, formerly SP-4). This investigation included the construction of monitoring well SP4-MW-5 in April 1989. The monitoring well is located adjacent to and west of Building 220 and was used in the 1991 investigation as a background groundwater sampling point (Figure 2-1).

The Site SS-2 Phase IV-A investigation conducted by G&M focused on constituents associated with the petroleum contaminated sites and groundwater samples collected during this investigation were not analyzed for PCBs. The results of the sampling associated with this Phase IV-A investigation at Site SS-2 have been summarized and reported in the Remedial Investigation Report (G&M, 1988).

2.3.5 1991 Remedial Investigation

In August 1991, an RI was conducted at Site SS-13 because the site was identified in the FFA as requiring additional investigation. The 1991 investigation conducted by G&M included the collection of 10 soil/weathered rock samples from five borings (SP3-SL-0001 through SP3-SL-0005). The borings surrounded the reported spill area located southeast of Building 220 (Figure 2-1). The borings were located outside the estimated perimeter of the excavation to identify possible contamination that was not removed during excavation activities.

Soil samples were collected from depths of 0 to 1 ft below land surface (bls) and 1 to 2 ft bls in each boring and submitted for PCB analysis. No PCBs were detected above laboratory reporting limits (5 mg/kg).

In the 1991 G&M investigation, a total of four monitoring wells were installed at Site SS-13. Three of the wells were constructed in the uppermost water-bearing zone beneath the site; a fourth monitoring well was constructed in a deeper water-bearing zone. Groundwater samples from the four wells were analyzed for PCBs. No PCBs were detected above laboratory reporting limits.

2.3.6 1993 Remedial Investigation Addendum

In the 1993 investigation performed by Montgomery Watson, one additional soil boring (SP3-SL-0006) was drilled at Site SS-13 (Figure 2-1). The boring was located nominally

in the center of the reported spill area. A total of two soil samples (one sample and a duplicate) were collected from a depth of 0 to 1 ft bls and submitted for analysis of volatile organic compounds (VOCs), base neutral/acid extractable compounds (BNAs), organochlorine (OC) pesticides/PCBs, metals, and cyanide. The four monitoring wells sampled in 1991 were resampled during the 1993 investigation. A total of five groundwater samples (four samples and a duplicate) were analyzed for VOCs, BNAs, OC pesticide/PCBs, metals, and cyanide.

No PCBs were detected above laboratory reporting limits in the soil samples from boring SP3-SL-0006. No PCBs were detected above laboratory reporting limits in the groundwater samples collected at Site SS-13. Because Operable Unit No. 3 is defined as the PCB Spill Area and associated potential PCB contamination only, all other analytical results from soil and groundwater samples will be incorporated into the ongoing Remedial Investigation at Operable Unit No. 7, Entomology Storage Area.

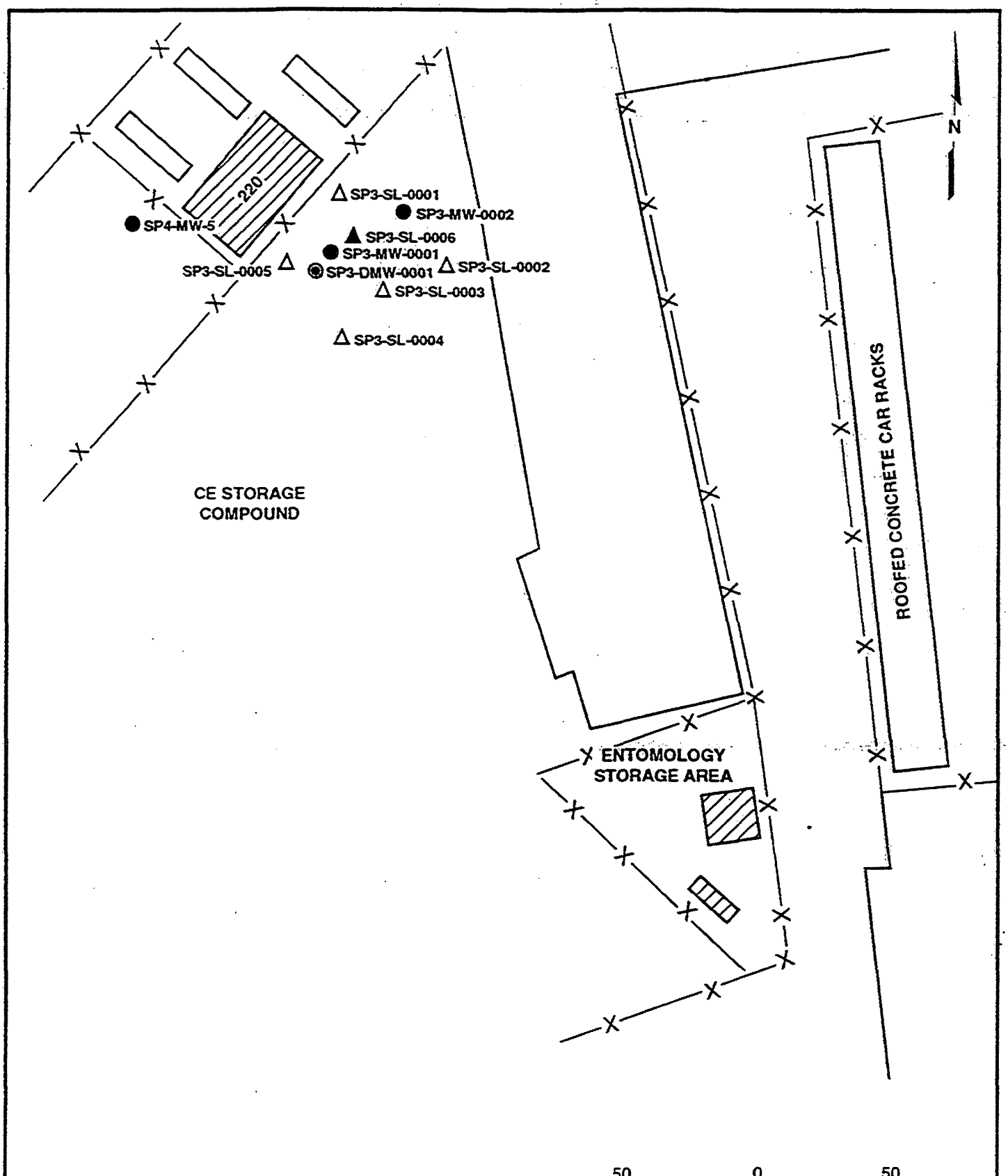
The purpose of the RI Addendum was to evaluate the current soil and groundwater quality with respect to the USEPA target compound list/target analyte list (TCL/TAL) and to fill data gaps from the previous field investigations.

An additional objective was to achieve lower detection limits for the PCB analysis than those reported for the 1991 RI, and thus, confirm that PCBs in site soils were effectively remediated by the excavation previously performed at the site.

2.4 COMMUNITY RELATIONS HISTORY

The Remedial Investigation/Baseline Risk Assessment report and the Proposed Plan for Homestead AFB Site SS-13 were released to the public in late 1993 and early 1994, respectively. These documents were made available to the public in both the administrative record and an information repository maintained at the Miami-Dade Community College Library.

A public comment period was held from March 8, 1994 to April 22, 1994 as part of the community relations plan for Operable Unit No. 3. Additionally, a public meeting was held on Tuesday, March 29, 1994 at 7:00 pm at South Dade High School. A public notice was published in the Miami Herald on March 21, 1994. At this meeting, the USAF, in coordination with EPA Region IV, FDEP, and Dade County Environmental Resource Management (DERM), were prepared to discuss the investigation, results of the



LEGEND

- SHALLOW MONITORING WELL GERAGHTY & MILLER 1991 INVESTIGATION
- DEEP MONITORING WELL GERAGHTY & MILLER 1991 INVESTIGATION
- SOIL BORING LOCATION GERAGHTY & MILLER 1991 INVESTIGATION
- NEW SOIL BORING LOCATION MONTGOMERY WATSON 1993 INVESTIGATION

HOMESTEAD AIR FORCE BASE
FLORIDA

PCB SPILL AREA, SITE SS-13
SOIL BORING AND MONITORING WELL LOCATION MAP

FIGURE 2-1

mac/proj/hw/homestead/rod's/aa533nol.drw

Baseline Risk Assessment, and the No Action Alternative described in the Proposed Plan. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

This decision document presents the selected remedial action for Operable Unit No. 3, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the NCP. The decision on the selected remedy for this site is based on the administrative record.

2.5 SCOPE AND ROLE OF OPERABLE UNIT 3

Homestead AFB, Florida with concurrence from the State of Florida and USEPA, has elected to define Operable Unit No. 3 as the PCB Spill Area and associated potential PCB contamination only. The remedial actions planned at each of the Operable Units at Homestead AFB are, to the extent practicable, independent of one another. However, with respect to Operable Unit No. 3 and Operable Unit No. 7 (Entomology Storage Area), the close proximity of these two operable units has resulted in some physical overlap of site boundaries.

PCBs have not been detected at Operable Unit No. 3; however, elevated levels of metals, primarily arsenic, have been detected within the site boundaries. Consequently, additional sampling will be conducted in conjunction with the Entomology Storage Area (Operable Unit No. 7) investigation to determine the extent of arsenic contamination throughout the area. Arsenic remediation, if necessary, will be conducted as part of Operable Unit No. 7.

2.6 SITE CHARACTERISTICS

Site history of the Civil Engineering Storage Compound has been incompletely documented and historical records are sparse. In the past, the area stored transformers containing polychlorinated biphenyl (PCB) fluids. In 1981, a spill of PCB contaminated (>50 and <500 ppm PCB) transformer fluid occurred immediately southwest of Building 220 in the Civil Engineering Storage Compound (Figure 1-2). Less than 100 gallons of fluid was involved. Following the incident, the impacted soil was analyzed and found to contain less than 50 ppm of PCB. Subsequently, the soil was removed and disposed of at an off-base site. Information on the volume of soils removed and a map

depicting the exact location of the excavation is not available. However, soil boring logs indicate an approximately 1 ft thick surficial layer of silty sand fill in the area of the spill/excavation.

This section describes the nature and extent of contamination identified in the soil and groundwater at Site SS-13. The nature and extent of contamination at Site SS-13 was first investigated in 1991 by G&M. Additional soil and groundwater sampling was conducted by Montgomery Watson in 1993. The investigations were conducted in accordance with the approved Facility Remedial Investigation Work Plan and Work Plan Addendum (G&M, 1991; G&M, 1993). The results of both investigations are discussed below.

2.6.1 Nature and Extent of Soil and Unsaturated Zone Contamination

2.6.1.1 Previous Investigation. The 1991 investigation conducted by G&M included the collection of ten soil/weathered rock samples from five borings (SP3-SL-0001 through SP3-SL-0005). The borings surrounded the reported spill area located southeast of Building 220 (Figure 2-1). The borings were located outside the estimated perimeter of the excavation to identify possible contamination that was not removed during excavation activities.

Soil samples were collected from depths of 0 to 1 ft bls and 1 to 2 ft bls in each boring and submitted for PCB analysis. No PCBs were present above laboratory reporting limits. Soil analytical results for the 1991 investigation are summarized in Table 2-1.

2.6.1.2 Current Investigation. In the current investigation, one additional soil boring (SP3-SL-0006) was drilled at Site SS-13 (Figure 2-1). The boring was located within the reported spill area to confirm that excavation activities had removed the PCB-contaminated soils. A total of two soil samples (one sample and a duplicate) were collected from a depth of 0 to 1 foot bls and submitted for analysis of VOCs, BNAs, OC pesticides/PCBs, metals, and cyanide. No PCBs were detected above laboratory reporting limits in the soil samples from boring SP3-SL-0006. Results of the PCB soil analysis are presented in Table 2-2.

Because Operable Unit No. 3 has been defined as the PCB Spill Area and associated potential PCB contamination only, all other analytical results from sample SP3-SL-0006

TABLE 2-1

SOIL ANALYTICAL RESULTS - PCBs
SITE SS-13 PCB SPILL C.E. STORAGE COMPOUND
GERAGHTY & MILLER, 1991
Homestead Air Force Base, Florida

Analyte	G&M Sample I.D. Savannah I.D. Sampling Date	SP3-SL-0001-1 34885-21 7/26/91	SP3-SL-0001-2 34885-22 7/26/91	SP3-SL-0002-1 34885-23 7/26/91	SP3-SL-0002-2 34885-24 7/26/91	SP3-SL-0003-1 34885-25 7/26/91	SP3-SL-0003-2 34885-26 7/26/91
POLYCHLORINATED BIPHENYLS (ug/kg dw):							
Aroclor - 1016		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1221		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1232		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1242		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1248		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1254		< 360	< 370	< 370	< 370	< 370	< 370
Aroclor - 1260		< 360	< 370	< 370	< 370	< 370	< 370

Analyte	G&M Sample I.D. Savannah I.D. Sampling Date	SP3-SL-0004-1 34885-27 7/26/91	SP3-SL-0004-2 34885-22 7/26/91	SP3-SL-0005-1 34885-28 7/26/91	SP3-SL-0005-2 34885-29 7/26/91	SP3-SL-9005-1 34885-30 7/26/91
Aroclor - 1016		<920	<200	<920	<960	<190
Aroclor - 1221		<920	<200	<920	<960	<190
Aroclor - 1232		<920	<200	<920	<960	<190
Aroclor - 1242		<920	<200	<920	<960	<190
Aroclor - 1248		<920	<200	<920	<960	<190
Aroclor - 1254		<920	<200	<920	<960	<190
Aroclor - 1260		<920	<200	<920	<960	<190

All samples analyzed by Savannah Laboratories, Tallahassee, Florida.
ug/kg dw micrograms per kilogram dry weight
< Analyte was not detected. The values given are equal to the practical quanitation limis and may vary among samples due to differences in water content, mass analyzed, and dilution factors.

Source: Geraghty & Miller, Inc (Draft 1992)

TABLE 2-2

SOIL ANALYTICAL RESULTS - PCBs
SITE SS-13 PCB SPILL C.E. STORAGE COMPOUND
MONTGOMERY WATSON, 1993
Homestead Air Force Base, Florida

Analyte	Units Interval	SP3SL00061 0.0-1.0 ft	SP3SL90061 0.0-1.0 ft
PCB TCL Compounds			
PCB-1016 (Aroclor 1016)	(ug/kg)	< 36	< 37
PCB-1221 (Aroclor 1221)	(ug/kg)	< 73	< 74
PCB-1232 (Aroclor 1232)	(ug/kg)	< 36	< 37
PCB-1242 (Aroclor 1242)	(ug/kg)	< 36	< 37
PCB-1248 (Aroclor 1248)	(ug/kg)	< 36	< 37
PCB-1254 (Aroclor 1254)	(ug/kg)	< 36	< 37
PCB-1260 (Aroclor 1260)	(ug/kg)	< 36	< 37

All samples analyzed by Savannah Laboratories, Tallahassee, Florida

< - not detected at specified detection limit

ug/kg - microgram per kilogram

and duplicate sample SP3-SL-9006 will be incorporated into the ongoing remedial investigation at Operable Unit No. 7, Entomology Storage Area.

2.6.2 Nature and Extent of Groundwater Contamination

2.6.2.1 Previous Investigation. In the 1991 G&M investigation, a total of four monitoring wells were installed at Site SS-13. Three of the wells were constructed in the uppermost water-bearing zone beneath the site; a fourth was constructed in a deeper water-bearing zone. Groundwater samples from the four wells were analyzed for PCBs. No PCBs were detected above laboratory reporting limits. Analytical results for the 1991 groundwater samples are summarized in Table 2-3.

2.6.2.2 Current Investigation. The four monitoring wells were re-sampled during the current investigation. A total of five groundwater samples (four samples and a duplicate) were analyzed for VOCs, BNAs, OC pesticides/PCBs, metals, and cyanide. No PCBs were detected above laboratory reporting limits. Results of the 1993 PCB groundwater analyses are presented in Table 2-4.

Because Operable Unit No. 3 has been defined as the PCB Spill Area and associated potential PCB contamination only, all other analytical results from groundwater samples will be incorporated into the ongoing remedial investigation at Operable Unit No. 7, Entomology Storage Area.

2.6.3 Potential Routes of Migration

Contaminants may migrate from a source area through a variety of processes. Volatile contaminants may be released into air and migrate in the vapor phase. Liquid or aqueous-phase contaminants may migrate to both soils and groundwater through direct infiltration. Erosion related to surface runoff or wind may transport contaminants sorbed to surface soils. Infiltrating precipitation may dissolve contaminants and carry them into deeper soils where they can be adsorbed, or into groundwater in the dissolved phase. Dissolved phase contaminants may be carried in the down gradient direction by groundwater flow in an aquifer.

A total of ten weathered rock/soil samples were collected during the 1991 investigation from locations around the perimeter of the reported excavation area. One additional

TABLE 2-3

GROUNDWATER ANALYTICAL RESULTS - PCBs
SITE SS-13 PCB SPILL C.E. STORAGE COMPOUND
GERAGHTY & MILLER, 1991
Homestead Air Force Base, Florida

Analyte	G&M Sample I.D. Savannah I.D. Sampling Date	Equipment Blank 35143-6 8/12/91	SP3-DMW-0001 35143-1 8/12/91	SP3-MW-0001 35143-2 8/12/91	SP3-MW-0002 35143-3 8/12/91	SP3-MW-0005 35143-4 8/12/91	SP3-MW-9005 35143-5 8/12/91
POLYCHLORINATED BIPHENYLS (ug/L):							
Aroclor - 1016		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1221		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1232		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1242		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1248		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1254		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor - 1260		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

All samples analyzed by Savannah Laboratories, Savannah, Georgia.
ug/L. micrograms per liter
< Analyte was not detected. The values given are equal to the practical quantitation limits and may vary among samples due to differences in quantity analyzed and dilution factors.

Source: Geraghty & Miller, Inc. (Draft 1991)

TABLE 2-4

GROUNDWATER ANALYTICAL RESULTS - PCBs
SITE SS-13 PCB SPILL C.E. STORAGE COMPOUND
MONTGOMERY WATSON, 1993
Homestead Air Force Base, Florida

Analyte	Units	SP3-DMW-0001	SP3-MW-0001	SP3-MW-0002	SP4-MW-0005	SP3-MW-9001	SP3-EB-0001	FLORIDA MCL	FEDERAL MCL
PCB TCL Compounds									
PCB-1016 (Aroclor 1016)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**
PCB-1221 (Aroclor 1221)	(ug/L)	< 2.3	< 2.3	< 2.2	< 2.2	< 2.2	< 2.5	0.5**	0.5**
PCB-1232 (Aroclor 1232)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**
PCB-1242 (Aroclor 1242)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**
PCB-1248 (Aroclor 1248)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**
PCB-1254 (Aroclor 1254)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**
PCB-1260 (Aroclor 1260)	(ug/L)	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	0.5**	0.5**

all samples analyzed by Savannah Laboratories, Tallahassee, Florida

< - not detected at specified detection limit
MCL - maximum contaminant level
NE - not established
* - value listed is for chlordane
** - value listed is for total PCB

sample was collected from within the reported excavated area in the 1993 investigation. All samples were analyzed for PCBs; none were detected.

A total of four groundwater monitoring wells were sampled during the 1991 investigation at Site SS-13. The four monitoring wells were resampled during the 1993 investigation at Site SS-13. All samples were analyzed for PCBs, none were detected.

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus, migration via the routes described above is not occurring.

2.6.4 Exposure Assessment

A critical step in assessing the potential risk to public health is to identify the pathways through which exposure could occur. A typical transport pathway consists of four necessary elements: 1) a source and mechanism of chemical release, 2) an environmental transport medium, 3) a point of potential contact with the contaminated medium, and 4) an exposure route (inhalation of vapors, ingestion of groundwater, etc.). All four of these elements must be present for a pathway to be complete.

As previously discussed, the analytical data collected by both Montgomery Watson in 1993 and by G&M in 1991 indicate no evidence of significant PCB-related contamination at Operable Unit No. 3.

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus, exposure via the pathways described above is not occurring.

2.7 SUMMARY OF SITE RISK

2.7.1 Identification of Contaminants of Potential Concern

This section presents the analytical data collected during the RI and other previous investigations that are used in the risk assessment, and on the basis of these data, determines which compounds are responsible for the greatest risks at the site. Four wells sampled by G&M (SP3-MW-0001, SP3-DMW-0001, SP3-MW-0002, and SP4-MW-5) for analysis of PCBs were resampled by Montgomery Watson for analysis of PCBs, TCL

pesticides, TCL volatile and TCL semivolatile organic compounds, and TAL metals. Ten soil samples were collected by G&M in 1991 for analysis of PCBs. One surface soil sample was collected by Montgomery Watson in 1993 for analysis of PCBs, pesticides, volatile and semivolatile organic compounds, and metals. It should be noted that the following evaluation of significance of chemical data is limited by the single sample for soil. The risk analysis eliminates from consideration any data that indicate that a compound is present within the range of natural background concentrations, because a compound present at these concentrations is probably not a contaminant released from Site SS-13. In addition to the four wells sampled by G&M in 1991 and resampled by Montgomery Watson in 1993, one background groundwater sample, SP4-MW-5, was collected in the Montgomery Watson sampling event. Five site-wide background soil borings, SP11-SL-0028-2, P3-SL-0023, P2-SL-0023-2, SP3-SL-0004-1, SP3-SL-0004-2 were collected during the G&M sampling event. In addition, compounds were further screened to determine frequency of detection, toxicity, i.e., whether the compound is an essential nutrient, a carcinogen, or a non-carcinogen, and if the concentrations detected at the site are greater than levels reported in the scientific literature. Reviewing all compounds detected at the site and selecting compounds of concern allows the risk assessment to focus on a manageable list of the most important chemicals, which in turn permits concise analysis and presentation.

2.7.2 Data Analysis

The analytical data for the 1993 risk assessment were collected by G&M during 1991 and by Montgomery Watson during 1993. G&M performed laboratory analyses and data validation for their field samples; Montgomery Watson performed its own data validation, which is to be reported in an *Internal Draft Quality Control Summary Report*, while Savannah Laboratories performed the laboratory analyses. All data collected by G&M and Montgomery Watson was used in this risk evaluation. This includes a review of detects, detection limits for non-detects, and estimated (J-qualified) data. Detection limits reported for Montgomery Watson samples were in compliance with contract laboratory protocol statement of work (CLP SOW) required detection limits.

2.7.2.1 Soil. As stated above, both the G&M and Montgomery Watson data sets were used in the risk assessment. Ten soil samples were collected by G&M in 1991 for analysis of PCBs. One surface soil sample was collected by Montgomery Watson in 1993 for analysis of PCBs, TCL pesticides, TCL volatile and TCL semivolatile organic compounds and TAL metals. The Montgomery Watson results confirm the earlier

findings of no PCBs in soil at detection limits of 36 to 73 micrograms per kilograms (µg/kg) (ppb), depending on the PCB isomer, which improved upon the detection limits for PCBs in soil previously reported by G&M.

2.7.2.2 Groundwater. Four wells sampled by G&M for analysis of PCBs were resampled by Montgomery Watson for analysis of PCBs, pesticides, volatile and semivolatile organic compounds, and metals. The Montgomery Watson results confirm the earlier findings of no PCBs in groundwater at detection limits of 0.5 to 2.0 microgram per liter (µg/L) (ppb). No pesticides were detected in groundwater samples at detection limits of 0.056 µg/l to 5.8 µg/l (ppb), depending upon the compound.

2.7.3 Compounds of Concern Selection Process

The compounds of concern selection process determines those chemicals that are most toxic and that are anticipated to create the greatest potential risk. However, analytical results indicate no evidence of significant PCB related contamination at Operable Unit No. 3.

It should be noted that several metals (aluminum, arsenic, copper, iron, lead, manganese, mercury, potassium, and zinc) were detected at levels above site background in the single soil sample and its duplicate collected by Montgomery Watson in 1993. Of these metals, only arsenic was detected at levels outside of any of the reference values presented in Table 2-5.

The potential public health significance of the elevated metals in the soil warrants further risk assessment. This metals data as well as all other soil and groundwater data (other than PCB data) will be incorporated into the ongoing investigation of Operable Unit No. 7, Entomology Storage Area.

2.7.4 Potential Routes of Migration

Contaminants may migrate from a source area through a variety of processes. Volatile contaminants may be released into air and migrate in the vapor phase. Liquid or aqueous-phase contaminants may migrate to both soils and groundwater through direct infiltration. Erosion related to surface runoff or wind may transport contaminants sorbed to surface soils. Infiltrating precipitation may dissolve contaminants and carry them into deeper soils where they can be adsorbed, or into groundwater in the dissolved phase. Dissolved

TABLE 2-5

BACKGROUND SOIL CONCENTRATIONS

Compound	Homestead AFB Background Soil(a) 0-2 ft bls	Typical Values for Uncontaminated Soils (b) (mg/kg)	Common Range(c) (mg/kg)	Average(c) (mg/kg)
Total PAHs (µg/kg)	738.55	0.01 - 1.3 forest (d) 0.01 - 1.01 rural 0.06 - 5.8 urban 8 - 336 road dust		
Total Phthalates (µg/kg)	126			
Metals (mg/kg)				
Aluminum	2400		700 ->10,000	57000
Antimony	<28 - 30	0 - 30	2 - 10(e)	--(e,f)
Arsenic	1.6	0 - 30	<0.1 - 73	7.4
Barium	42.9	0 - 500	10 - 1,500	420
Beryllium	<2.8 - 2.9	0 - 5	<1 - 7	0.85
Cadmium	<2.8 - 3.0	0 - 1	0.01 - 0.1(e)	0.06(e)
Calcium	345,000		10 - 28,000	630
Chromium	11.5	0 - 100	1 - 1,000	52
Cobalt	<1.1 - 1.2	7	<0.3 - 70	9.2
Copper	<2.7 - 3.0	30	<1 - 700	22
Iron	1650		10 - 10,000	2,500
Lead	4.05	0 - 500	<10 - 300	17
Magnesium	1050	0 - 500	5 - 5,000	460
Manganese	23	0 - 500	<2 - 7,000	640
Mercury	0.014	0 - 1	<0.01 - 3.4	0.12
Nickel	<4.5 - 4.7	15	<5 - 700	18
Potassium	<110 - 120		5 - 3,700	--(f)
Selenium	<5.6 - 5.7	0 - 1	<0.01 - 3.9	0.45
Silver	<1.1 - 1.2	0.15	0.01 - 5.0(e)	0.05(e)
Sodium	555		<500 - 50,000	7,800
Thallium	<1.1 - 5.6		2.2 - 23	8.6
Vanadium	<5.7 - 5.9	0 - 100	<7 - 300	66
Zinc	20	60	<5 - 2,900	5.2

(a) Source: Based on 5 background samples as reported in Geraghty & Miller, 1992.

(b) Source: Gas Research Institute, 1987.

(c) U.S. Geological Survey Professional Paper 1270, Element Concentrations in Soils and Other Surficial Material of the Conterminous United States Page 4, Table 1 (unless indicated otherwise).

(d) Source: Menzie, et al., 1992.

(e) Data for these metals were not included in the USGS Paper. Concentrations were obtained from the USEPA Office of Solid Waste and Emergency Response, Hazardous Waste Land Treatment, SW-874, April 1983, Page 273, Table 6.45.

(f) Average not established.

phase contaminants may be carried in the down gradient direction by groundwater flow in an aquifer. Migration via any of these potential pathways is affected by the fate and transport mechanisms previously discussed.

Based on PCB soil analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus, migration via the routes described above is not occurring.

2.7.5 Exposure Assessment

An exposure assessment is conducted to identify potential sources and mechanisms of release, transport pathways (e.g. ground water, surface water, soil, and air), routes of exposures (ingestion, inhalation, dermal contact), and potential on-site and off-site receptor populations (current users of the site, as well as adjacent populations which may be exposed to chemicals that have been transported off-site). This information provides the basis for constructing site-specific exposure scenarios.

Other information considered in the development of present and future exposure scenarios includes: physical characteristics of the site and surrounding area such as climatology, groundwater hydrology, location and description of surface water and surrounding land use and available state-specific guidelines relevant to exposure and risk assessments.

A critical step in assessing the potential risk to public health is to identify the pathways through which exposure could occur. A typical transport pathway consists of four necessary elements: 1) a source and mechanism of chemical release, 2) an environmental transport medium, 3) a point of potential contact with the contaminated medium, and 4) an exposure route (inhalation of vapors, ingestion of groundwater, etc.). All four of these elements must be present for a pathway to be complete.

As previously discussed the analytical data collected by both Montgomery Watson in 1993 and by Geraghty & Miller in 1991 indicate no evidence of significant PCB-related contamination at Operable Unit No. 3. Several metals, in particular arsenic, were detected in concentrations above site background. The limited soil data (one surface sample and duplicate) available at this time limits the usefulness of performing full risk assessment calculations until further verification and extent can be determined. Operable Unit No. 3 is defined as the PCB Spill Area and associated potential PCB contamination only; therefore, the arsenic detection will be evaluated in the RI/BRA for Operable Unit No. 7, Entomology Storage Area.

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus exposure via the pathways described above is not occurring.

2.7.6 Toxicity Assessment

This section of the baseline risk assessment provides information on the human health effects of site-specific contaminants of potential concern. Additional information considered in this section includes physical and chemical characteristics that influence fate, mobility, and bioaccumulative potential. The information presented in this section provides a basis for the dose-response assessment carried out in the quantitative risk assessment.

Evaluation of the toxic potential of a chemical involves the examination of available data that relate observed toxic effects to doses. Generally, there are two categories of information that are considered in this part of a quantitative risk assessment:

- Information on the potential for chemicals to initiate or promote cancers;
- Information on the potential acute or chronic non-cancer effects of chemicals;

Much of this information would be included in detail in toxicological profiles created for the risk assessment.

A wide variety of factors must be considered in using health effects data in qualitative or quantitative assessments. As discussed in the following subsections, there may be a variety of relationships between dose and effects. Also, the fact that some chemicals display thresholds (i.e., there are doses below which the chemical does not cause an effect) must be considered. In general, non-carcinogenic (acute or chronic systemic) effects are considered to have threshold values, while carcinogenic effects are considered not to have thresholds. Toxicity studies for the former focus on identifying where this threshold occurs. The threshold can be related to a reference dose (RfD). A chronic RfD is an estimate of a daily exposure level for which people, including sensitive individuals, do not have an appreciable risk of suffering significant adverse health effects. Exposure doses above an RfD could possibly cause health effects. Studies of carcinogenicity tend to focus on identifying the slope of the linear portion of a curve of dose versus response. A plausible upper-bound value of the slope is called the slope factor (SF) or cancer potency factor (CPF). The product of the SF and the exposure dose is an estimate of the

risk of developing cancer. In accordance with current scientific policy concerning carcinogens, it is assumed that any dose, no matter how small, has some associated response. This is called a non-threshold effect. In this assessment, the no-threshold effect was applied to all probable carcinogens. EPA has classified carcinogens with regard to the epidemiologic and toxicologic data available.

As previously discussed the analytical data collected by both Montgomery Watson in 1993 and by G&M in 1991 indicate no evidence of significant PCB-related contamination at Operable Unit No. 3. Several metals, in particular arsenic, were detected in concentrations above site background. The limited soil data (one surface sample and duplicate) available at this time limits the usefulness of performing full risk assessment calculations until further verification and extent can be determined. Operable Unit No. 3 is defined as the potential PCB Spill Area and associated potential PCB contamination only; therefore, the arsenic detection will be evaluated in the RI/BRA for Operable Unit No. 7, Entomology Storage Area

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus the need for a quantitative risk assessment is eliminated.

2.7.7 Risk Characterization

This section of the baseline risk assessment describes how calculated exposure doses are converted into health risks. This section characterizes risks as part of a quantitative risk assessment for the site. Risk characterization involves the integration of health effects information developed as part of the dose-response assessment with exposure estimates developed as part of exposure assessment. The result is a quantitative estimate of chronic and non-carcinogenic risks based on the presumption that a threshold dose is required to elicit a response, as well as a quantitative estimate of carcinogenic risks presumed to exist regardless of the dose. These estimates are usually presented in either probabilistic terms (e.g., 1 in one million), or with reference to specific benchmark or threshold levels. Because risk estimates are based on a combination of measurements and assumptions, it is important to provide information on sources of uncertainty in risk characterization. The key elements of risk characterization as described below are: an estimation of human dose, an estimation of risk, a presentation of risk, and an uncertainty analysis.

As previously discussed the analytical data collected by both Montgomery Watson in 1993 and by G&M in 1991 indicate no evidence of significant PCB-related contamination at Operable Unit No. 3. Several metals, in particular arsenic, were detected in concentrations above site background. The limited soil data (one surface sample and duplicate) available at this time limits the usefulness of performing full risk assessment calculations until further verification and extent can be determined. Operable Unit No. 3 is defined as the potential PCB Area and associated potential PCB contamination only; therefore, the arsenic detection will be evaluated in the RI/BRA for Operable Unit No. 7, Entomology Storage Area.

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus the need for a quantitative risk assessment is eliminated.

2.7.8 Ecological Risk

This section addresses the ecological risks to plants and animals potentially affected by contaminants at Homestead AFB. The area surrounding Homestead AFB is characterized by diverse and rich biological habitats that support a wide variety of plants and animals. Site SS-13 is located directly north of Operable Unit No. 7 and west of Biggs Street, and is a small area adjacent to a storage building where PCBs containing transformers were previously stored.

An environmental assessment addresses the potential impacts and risks associated with existing conditions at Homestead AFB. It provides a qualitative and quantitative evaluation of the current and future risks represented by the present site conditions. A variety of methods are employed to examine the impacts and risks to the terrestrial and aquatic components of the system.

The specific objectives of an assessment include the following: identify species that may be exposed to site-related compounds; select endpoints of concern; identify the ecological exposure pathways; measure or estimate exposure point concentrations; develop information on the chemical's toxicity; characterize the environmental risks associated with the exposure under current and future conditions; assess the uncertainties associated with the estimates; and, discuss the ecological significance of the findings. The qualitative assessment is a broad, cursory evaluation of risks to all ecological life in conjunction with a focused assessment of significant ecological concerns.

The Environmental Assessment uses a "weight of evidence" approach which includes direct field observations, selected field and laboratory studies, and evaluation of chemical analytical data relative to environmental benchmarks. When integrated into the overall assessment, these methods provide a perspective on the nature of ecological risks at a site.

In the early spring of 1993, G&M prepared an Ecological Inventory for Homestead Air Force Base (G&M, 1993). This inventory provided identification and characterization of biotic communities and the associated flora and fauna at or near the base sites. Site SS-13 is characterized as a composite of deteriorating asphalt and concrete pavements, compacted dirt and gravel, bare limerock and a scattered, discontinuous covering of weeds, such as white beggar ticks, button weed, tridax (*Tridax procumbens*), and blue porterweed (*Stachytarpheta jamaicensis).* Hurricane Andrew struck Homestead AFB in August 1992, before the ecological inventory was conducted. This site has been developed for use in base operations, thus buildings and asphalt paving have replaced natural habitat. The hurricane destroyed Building 220, a former civil engineering storage area. Subsequent to the hurricane, this area was used as a staging/storage area for salvageable materials and equipment for the entire base. The materials are stored in the unpaved area of the site. This operable unit is defined as the PCB spill only, therefore, elevated levels of other contaminants in soil are evaluated in the Remedial Investigation/Baseline Risk Assessment for Entomology Storage Area, Site SS-7. The biologist conducted no shovel dig within this unit because pavement and gravel (to bedrock) characterized this area. Thus, site impacts to ecological receptors are expected to be minimal.

As previously discussed the analytical data collected by both Montgomery Watson in 1993 and by G&M in 1991 indicate no evidence of significant PCB-related contamination at Operable Unit No. 3. Several metals, in particular arsenic, were detected in concentrations above site background. Operable Unit No. 3 is defined as the potential PCB Spill Area and associated potential PCB contamination only; therefore the arsenic detection will be evaluated in the RI/BRA for Operable Unit No. 7, Entomology Storage Area.

Based on PCB analytical results collected to date, the PCB spill at Operable Unit No. 3 has been effectively remediated by the excavation activities and thus the site poses no significant ecological risk.

2.8 DESCRIPTION OF THE "NO ACTION" ALTERNATIVE

Based on PCB analytical results collected to date, the PCB Spill Area is free of PCB contamination and therefore warrants a No Action ROD to close out Site SS-13.

Homestead Air Force Base, Florida
Operable Unit 3
Site SS-13, PCB Spill Area

Responsiveness Summary for the Record of Decision

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RESPONSIVENESS SUMMARY

FOR THE

RECORD OF DECISION

The responsiveness summary serves three purposes. First, it provides regulators with information about the community preferences regarding both the remedial alternatives and general concerns about Operable Unit No. 3, Homestead AFB. Second, the responsiveness summary documents how public comments have been considered and integrated into the decision making process. Third, it provides EPA with the opportunity to respond to each comment submitted by the public on the record.

The Remedial Investigation/Baseline Risk Assessment report and the Proposed Plan for Homestead AFB Site SS-13 were released to the public in late 1993 and early 1994, respectively. These documents were made available to the public in both the administrative record and an information repository maintained at the Miami-Dade Community College Library.

A public comment period was held from March 8, 1994 to April 22, 1994 as part of the community relations plan for Operable Unit No. 3. Additionally, a public meeting was held on Tuesday, March 29, 1994 at 7:00 pm at South Dade High School. A public notice was published in the Miami Herald on March 21, 1994. At this meeting, the USAF, in coordination with EPA Region IV, FDEP, and DERM were prepared to discuss the investigation, results of the Baseline Risk Assessment, and the No Action Alternative described in the Proposed Plan.

No comments were received during the public comment period and no comments were made at the public meeting regarding the proposed No Action Alternative at Operable Unit No. 3.