THE UNITED STATES NAVY

INSTALLATION RESTORATION PROGRAM

FINAL

RECORD OF DECISION
FOR
SITES 48, 56, 58, 70, and 73
SITE WIDE OPERABLE UNIT

ANDERSEN AIR FORCE BASE, GUAM

November 2009

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14. ABSTRACT
This Record of Decision (ROD) presents the rationale for the No Action decision for Installation Restoration Program (IRP) Sites 48, 56, 58, 70, and 73, located in the Site Wide Operable Unit at Andersen AFB, Guam. This ROD summarizes the history, environmental background, extent of contamination, human health risk assessment and screening level ecological risk assessment at Site 48, risk screening at Sites 56, 58, 70, and 73, public involvement, and rationale for No Action.

15. SUBJECT TERMS
- Andersen AFB
- Installation Restoration Program
- Public Involvement
- Record of Decision
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Acronyms and Abbreviations

AFB	Air Force Base
AR	Administrative Record
AST	aboveground storage tank
AVGAS	aviation gas
bgs	below ground surface
BTV	Background Threshold Value
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CES/CEVR	Civil Engineer Squadron/Civil Engineer Environmental Flight
COPC	contaminant of potential concern
CSM	Conceptual Site Model
DERP	Defense Environmental Restoration Program
DSI	detailed site inventory
EA	EA Engineering, Science, and Technology, Inc.
EBS	Environmental Baseline Survey
EM	electromagnetic
EPC	exposure point concentration
ESI/VSI	Expanded Source Investigation/Visual Site Inspection
°F	Degrees Fahrenheit
FFA	Federal Facility Agreement
FUDS	Formerly Used Defense Sites
Guam EPA	Guam Environmental Protection Agency
HHRA	human health risk assessment
ICF	ICF Technology, Inc.
ID	Identification
IEUBK	Integrated Exposure Uptake Biokinetic Model
IRP	Installation Restoration Program
LEAD99D	LEAD version 0.99D
LTGM	Long-term Groundwater Monitoring
MARBO	Marianas/Bonins Command
MEC	munitions and explosives of concern
µg/dL	microgram per deciliter

µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
MMRP	Military Munitions Response Program
msl	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan of 1990
NEPA	National Environmental Policy Act
NFRAP	No Further Response Action Planned
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Inspection
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PRG	Preliminary Remediation Goal
ROD	Record of Decision
RPM	Remedial Program Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SLERA	screening level ecological risk assessment
SQR	screening quotient ratio
SVOC	semivolatile organic compound
TAL	Target Analyte List
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
USN	United States Navy
VOC	volatile organic compound

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1.0 Declaration

1.1 Site Name and Location

Facility Name: Andersen Air Force Base (AFB), Guam
Site Location: Yigo, Guam
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification (ID) Number: GU6571999519
Operable Unit/Site: Five Installation Restoration Program (IRP) sites located in the Site Wide Operable Unit (OU):

- Site 48
- Site 56
- Site 58
- Site 70
- Site 73

1.2 Statement of Basis and Purpose

This decision document presents the selected remedies for the IRP Sites 48, 56, 58, 70, and 73 located at Andersen AFB, Yigo, Guam (Figures 1-1 and 1-2). The selected remedies were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record (AR) for these sites, including pertinent IRP documents, correspondence, and material related to the CERCLA investigations and cleanups.

This document is issued by the United States Navy (USN)[1], as the lead agency. The USN is managing remediation of contamination at the Site Wide OU sites listed above in accordance with CERCLA as required by the Defense Environmental Restoration Program (DERP). The USN and the United States Environmental Protection Agency (USEPA) have jointly

[1] The Department of Defense is in the process of realigning installation management functions at Andersen AFB. On October 1, 2009, pursuant to the 2005 Defense Base Closure and Realignment Commission Report, administrative custody of all real property on Andersen AFB and responsibility for installation support functions, including Environmental Restoration Program responsibilities, transferred within the Department of Defense from the Department of the Air Force to the Department of Navy. Title to Andersen AFB real property will remain with the United States and the Air Force will continue to utilize the Base. The Navy will also utilize portions of the Base. In accordance with the April 15, 2008, Department of Defense Environmental Supplemental Guidance for Implementing and Operating a Joint Base, at the time of property transfer the Navy, as the new property manager at the Base, assumed responsibility "for all existing and future environmental permits, requirements, plans, and agreements" at the Base (Ch. 1.1.2) and was required to "honor all existing, previously negotiated Federal Facility Agreements in place." (Ch. 2.17.5 of the Guidance).

In January 2009, the Navy and the Air Force entered into a separate Memorandum of Agreement, which delegated installation support and authority back to the Air Force General who is the Andersen Base Commanding Officer under the authority, control, and direction of the Joint Region Commander, who is a Navy Admiral. This delegation includes the authority to sign Records of Decision. The Andersen Base Commanding Officer and Andersen environmental staff continue to administer the FFA under Navy direction. Both the Air Force and the Navy notified USEPA of the change of administrative responsibility under the FFA (See Appendix B).

selected the remedies, and the Guam Environmental Protection Agency (Guam EPA) has concurred with the decision, under the guidelines established in the Federal Facilities Agreement (FFA) signed in February 1993 by representatives of USEPA Region 9, Guam EPA, and the USAF (USEPA et al., 1993).

1.3 Description of Selected Remedy

Based on the results of a previously conducted Remedial Investigation (RI) (EA Engineering, Science, and Technology, Inc. [EA], 2007a) for Site 48 and a Preliminary Assessment/Site Inspection (PA/SI) at Sites 56, 58, 70, and 73 (EA, 2007b), the USN has determined that no CERCLA remedial action is required at these IRP sites.

1.4 Statutory Determinations

This section describes how the selected remedies satisfy the statutory requirements of CERCLA §121 and the regulatory requirements of the NCP.

Because the results of a human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA) indicate that there are no unacceptable risks to human or ecological receptors at Site 48, the USN has determined that no CERCLA remedial action is necessary, and the site is free for unrestricted use and unlimited access to the land.

Because the soil sample analytical results for Sites 48, 56, 58, 70, and 73 indicate that there are no unacceptable risks to human health or the environment, the USN has determined that no CERCLA remedial action is necessary, and the sites are suitable for unrestricted use and unlimited access to the land.

Previous site investigations recommended No Further Response Action Planned (NFRAP) decisions for Sites 56, 58, 70, and 73, and a NFRAP Decision Document was finalized in September 2007.

Because there are currently no hazardous substances, pollutants, or contaminants at the sites above levels that would allow for unlimited use and unrestricted exposure, a five-year review is not required.

1.5 Data Certification Checklist

The information included in the Decision Summary section (Section 2) of this Record of Decision (ROD) is summarized in Table 1-1. Additional information can be found in the AR file for Andersen AFB, Yigo, Guam, which is available for public review at the Robert F. Kennedy Library at the University of Guam and the Nieves M. Flores Memorial Library in Hagåtña.

1.6 Authorizing Signatures

The following signature sheets document the decision by USN and USEPA Region 9 that no remedial action is required for Sites 48, 56, 58, 70, and 73, Site-Wide OU, Andersen AFB, Guam, and the concurrence of Guam EPA in that decision.

This signature sheet documents the USN and Andersen AFB co-selection of No Action as the remedial action in this ROD for Site Wide OU Sites 48, 56, 58, 70, and 73, Andersen AFB, Guam.

JOHN W. DOUCETTE
Brigadier General, USAF
Base Commanding Officer[2]

8 Aug 11
Date

[2] Under Delegation of Authority from Commander Joint Region Marianas. See Footnote [1].

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This signature sheet documents the USEPA Region 9 co-selection of No Action as the remedial action in this ROD for Site Wide OU Sites 48, 56, 58, 70, and 73, Andersen AFB, Guam.

John Chatt for

ANGELES HERRERA
Acting Assistant Director
Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency, Region 9

4-12-11
Date

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This signature sheet documents the Guam EPA concurrence of No Action as the remedial action in this ROD for Site Wide OU Sites 48, 56, 58, 70, and 73, Andersen AFB, Guam.

_____ _____

IVAN C. QUINATA Date
Administrator
Guam Environmental Protection Agency

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Table 1-1
Data Certification Summary.

Decision Summary Sections	Site 48	Site 56	Site 58	Site 70	Site 73
List of COCs and their respective concentrations	NA	NA	NA	NA	NA
Baseline risk represented by the COCs	NA	NA	NA	NA	NA
Cleanup levels established for COCs and the basis for these levels	NA	NA	NA	NA	NA
How source materials constituting principal threats will be addressed	NA	NA	NA	NA	NA
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD	X	X	X	X	X
Potential land and groundwater use that will be available at the site as a result of the selected remedies	X	X	X	X	X
Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	NA	NA	NA	NA	NA
Key factor(s) that led to selecting the remedy (i.e., describe how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)	NA	NA	NA	NA	NA

COC = contaminant of concern
ROD = Record of Decision
NA = Not Applicable

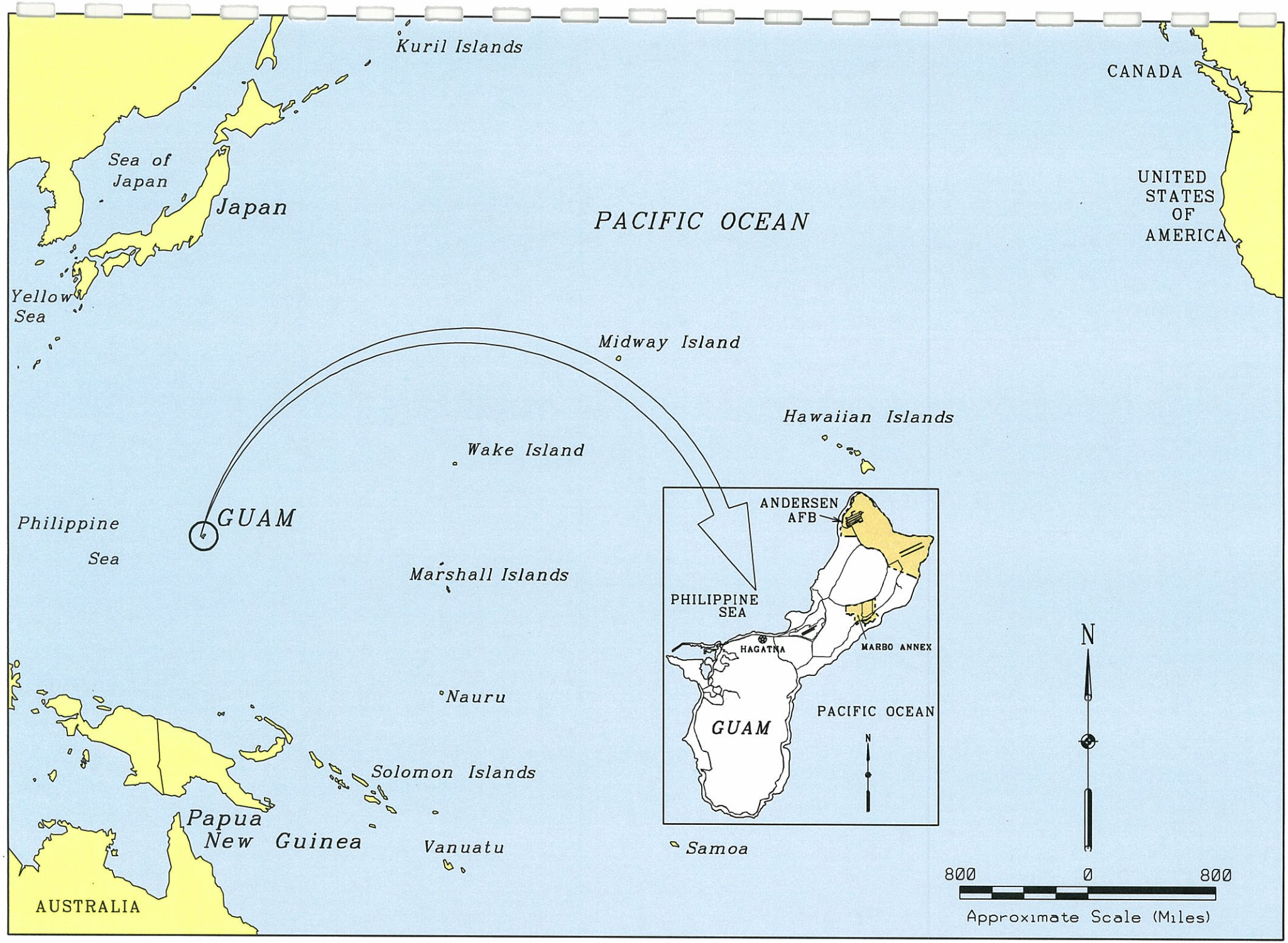


Figure 1-1. Location Map of Guam.

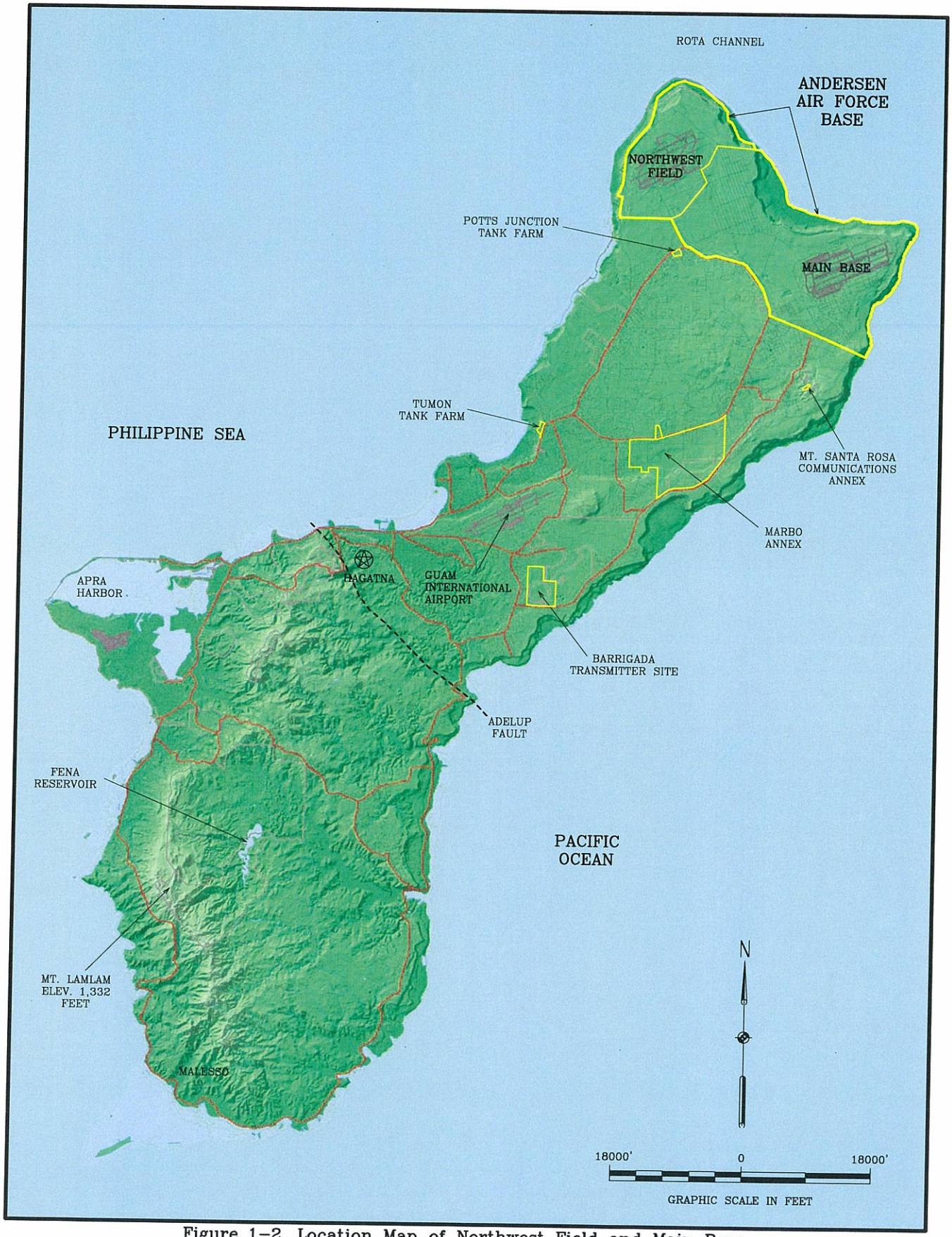


Figure 1–2. Location Map of Northwest Field and Main Base, Andersen Air Force Base, Guam.

2.0 Decision Summary

The Decision Summary identifies the selected remedies for Sites 48, 56, 58, 70, and 73; explains how the remedies fulfill statutory and regulatory requirements; and provides a substantive summary of the AR file that supports the remedy selection decision.

2.1 Site Names, Locations, and Descriptions

The following section presents descriptions of each of the sites and their locations.

Site 48

Full Site Name:	IRP Site 48
CERCLIS ID Number:	GU6571999519
Site Location:	Yigo, Guam
Site Type:	Tank Farm

Site 48 is located in the southern portion of Northwest Field along Route 3A, directly across from the entrance to the airfield apron (Figures 2-1 and 2-2). The site occupies approximately 13.6 acres and is covered with low vegetation and trees. The site is unfenced and readily accessible to human and ecological receptors. Sixteen aboveground storage tanks (ASTs), that reportedly contained aviation gas (AVGAS) and diesel fuel, have been removed from the site. The ASTs were connected to the Potts Junction Tank Farm via a former AVGAS pipeline. The site consists of four areas and contains four circular and two rectangular tank berms.

Site 56

Full Site Name:	IRP Site 56
CERCLIS ID Number:	GU6571999519
Site Location:	Yigo, Guam
Site Type:	Surface Debris Disposal Area

Site 56 consists of two adjacent areas, Areas A and B, located in the Northwest Field between the North Runway and North Taxiway (Figures 2-1, 2-3, and 2-4). Area A is an inactive disposal site located in a quarried area that contains a limestone rubble waste pile (approximately 90 feet long by 20 feet wide) and a soil mound (approximately 80 feet by 80 feet) that is densely vegetated. During the 2006-2007 site investigation, surface debris observed in Area A included drum remnants, miscellaneous metal debris, and glass bottles. In addition, an open pit (approximately 10 feet long by 6 feet wide by 8 feet deep) with little debris other than a few glass bottles was observed in the southern portion of Area A.

Site 56 Area B is an inactive disposal site consisting of an asphalt pile. An abandoned roadway is located within 50 feet of the asphalt pile. During the 2006-2007 site investigation, the asphalt pile was approximately 15 feet long by 5 feet wide by 2.5 feet high. The asphalt appeared to have been discharged to the ground in a viscous state. Surface debris observed in Area B included miscellaneous automotive parts and scattered glass bottles.

Site 58

Full Site Name: IRP Site 58
CERCLIS ID Number: GU6571999519
Site Location: Yigo, Guam
Site Type: Surface Debris Disposal Area

Site 58 is located in the Northwest Field, south of the South Runway and approximately 600 feet southeast of the Southwest Crossover (Figures 2-1 and 2-5). The site is a former borrow pit for crushed limestone sub base fill material that contains low-lying mounds of soil and limestone rubble in the middle of the site. During the 2006-2007 site investigation, corrugated metal was present in and on top of the mounds. Approximately 15 to 20 severely deteriorated 55-gallon drums were observed at the site. The drums, which appeared to have been bulldozed into a pile, were located in a 60-foot by 30-foot area that contained crushed limestone and soil.

Site 70

Full Site Name: IRP Site 70
CERCLIS ID Number: GU6571999519
Site Location: Yigo, Guam
Site Type: Surface Debris Disposal Area

Site 70 consists of two separate areas, Areas A and B, located in the eastern portion of the Northwest Field (Figures 2-1, 2-6, and 2-7). Area A is an inactive waste pile located approximately 150 feet south of Service Apron 2097, adjacent to concrete pad T-2016. During the 2006-2007 site investigation, the waste pile was situated in an open excavation or depression that was approximately 40-feet long by 12-feet wide by 3- to 4-feet deep. Waste observed in the excavation included rusted metal, an oil-stained steel bucket, and empty pull-tab canisters. The waste was mixed with crushed limestone and soil. Two asphalt/concrete pads and a small mound were also present at the site.

Site 70 Area B consists of a waste pile bounded by 12th, 13th, "M", and "K" Streets. During the 2006-2007 site investigation, a majority of the area between these streets was covered with a layer of waste that varied in thickness. The waste covered a 400-foot by 200-foot area along "K" and 13th Streets, and included rusted metal debris, an empty metal gas cylinder, a water heater tank, a wooden telephone pole, concrete debris, metal cans, and glass bottles.

Site 73

Full Site Name: IRP Site 73
CERCLIS ID Number: GU6571999519
Site Location: Yigo, Guam
Site Type: Surface Debris Disposal Area

Site 73 is located in the southern portion of the Northwest Field and consists of a drum pile situated on the north edge of a densely vegetated quarry area, approximately 150 feet northwest of the 6th and "A" Street intersection (Figure 2-8). During the 2006-2007 site investigation, approximately 16 empty, severely corroded, 55-gallon steel drums were observed in an irregular pile that covered a 20-foot by 30-foot area near the center of the site. The majority of the drums

were perforated from corrosion and some had obvious puncture marks. None of the drums were still capable of holding liquids. The drums were not marked and their former contents are unknown. Additionally, an area of asphalt material was observed west of the drum pile.

2.2 Site History and Enforcement Activities

This section provides background information and summarizes the investigations that led to the ROD. It describes the CERCLA response actions undertaken at the Site Wide OU, Sites 48, 56, 58, 70, and 73.

Due to its primary mission in national defense, the USAF has long been engaged in a wide variety of operations that involve the use, storage, and disposal of hazardous materials. On 14 October 1992, Andersen AFB was formally listed on the National Priorities List by the USEPA to investigate abandoned sites that may have been impacted by the use, storage, and disposal of hazardous materials.

The USN and USAF have conducted environmental investigations and remedial activities at the Site Wide OU, Sites 48, 56, 58, 70, and 73 in accordance with CERCLA under the DERP, which was established by Section 211 of SARA.

As the support agencies, the USEPA Region 9 and the Guam EPA provide primary oversight of the environmental restoration actions, in accordance with the FFA. The enforcement activities for Andersen AFB were initiated when the USAF entered into a FFA with the USEPA Region 9 and the Guam EPA (USEPA et al., 1993). The FFA, finalized on 30 March 1993, established procedures for involving federal and territorial regulatory agencies, as well as the public, in the environmental restoration process at Andersen AFB. The FFA was based on applicable environmental laws, including CERCLA, the Hazardous and Solid Waste Act of 1982, SARA, and the NCP.

Funding is provided by the Defense Environmental Restoration Account, a funding source approved by Congress to clean up contaminated sites on U.S. Department of Defense installations.

In accordance with USN policy, to the extent practicable, National Environmental Policy Act (NEPA) values have been incorporated throughout the CERCLA process culminating in this ROD. Separate NEPA documentation will not be issued.

Site 48

Site 48 has been evaluated in the following three environmental reports:

- *Phase I-Environmental Baseline Survey Report, The Northwest Field, Andersen AFB, Guam, Mariana Islands* (ICF Technology, Inc. [ICF], 1995)
- *Phase II Environmental Baseline Survey for Northwest Field, Andersen AFB, Guam* (EA, 1998a)
- *Remedial Investigation/Feasibility Study for Sites 47, 48, 49, 50, 51, 52, 53, and 55, Site Wide Operable Unit, Andersen Air Force Base, Guam* (EA, 2007a)

Site 48 was identified during the Phase I Environmental Baseline Survey (EBS) of the Northwest Field. The Phase I EBS report described the site as historically containing 16 ASTs used to store AVGAS and diesel fuel (Figure 2-2). No records were found during the Phase I EBS file search documenting any structures in this area, nor were any maps found to indicate the nature of the operations at the site. Subsequently, a Phase II EBS was conducted in 1996, which resulted in a recommendation for further investigation at Site 48.

An RI was conducted at Site 48 in 2005 (EA, 2007a). Surface and subsurface soil samples were collected and a HHRA and SLERA were conducted. No unacceptable risks to human health or the environment were identified; therefore, no further action is required at Site 48.

Site 56

Site 56 has been evaluated in the following environmental reports:

- *Expanded Source Investigation/Visual Site Inspection Report, Andersen Air Force Base, Guam* (ICF, 1996a)
- *Installation Restoration Program, Final Records Search for Andersen Air Force Base, Guam* (ICF, 1996b)
- *Preliminary Assessment/Site Inspection for Ten IRP Sites at Northwest Field, Andersen Air Force Base, Guam* (EA, 2007b)
- *Final No Further Response Action Planned (NFRAP) Decision Document for Sites 56, 58, 70, and 73, Northwest Field, Andersen Air Force Base, Guam* (EA, 2007c)

Site 56 was identified in the Expanded Source Investigation/Visual Site Inspection (ESI/VSI) report (ICF, 1996a) and the Records Search report (ICF, 1996b). According to the Records Search report, there is no documentation describing any disposal activities at Site 56 (ICF, 1996a). On 12 November 1962, Typhoon Karen destroyed a majority of the historical documents associated with the Northwest Field. Consequently, most of the historical information presented in the Records Search Report is derived from aerial photographs (ICF, 1996a).

Historical aerial photographs of Site 56 are available covering the time period of 1945–1994. The photographs taken during the 1940s and 1950s were from high altitude, with poor resolution. While the photographs do show evidence of past clearing activities adjacent to Site 56, they do not provide enough detail to make a definitive determination of past disposal activities.

An undated aerial photograph taken between 1945 and 1948 shows an approximately 800-foot-long and 200-foot-wide quarried area located north of North Runaway. The photograph also shows a street located midway between and running parallel to North Taxiway and North Runway. Both the street and quarry are located southeast of and adjacent to Site 56, and appear to be cleared to bedrock.

In the photographs from 1954 to 1994, no further clearing is evident, the site appears to be inactive, and vegetation is progressively reestablishing itself at the site (EA, 2007c).

Site 56 was further evaluated and described in the PA/SI report (EA, 2007b). Surface soil samples were collected and no potential risks to human health or the environment were identified at the site (EA, 2007c). A NFRAP Decision Document was finalized in September 2007.

Site 58

Site 58 has been evaluated in the following environmental reports:

- *Expanded Source Investigation/Visual Site Inspection Report, Andersen Air Force Base, Guam* (ICF, 1996a)
- *Installation Restoration Program, Final Records Search for Andersen Air Force Base, Guam* (ICF, 1996b)
- *Preliminary Assessment/Site Inspection for Ten IRP Sites at Northwest Field, Andersen Air Force Base, Guam* (EA, 2007b)
- *Final No Further Response Action Planned (NFRAP) Decision Document for Sites 56, 58, 70, and 73, Northwest Field, Andersen Air Force Base, Guam* (EA, 2007c)

Site 58 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). According to the Records Search report, there is no documentation describing any disposal activities at the site (ICF, 1996a). Most of the historical information presented in the Records Search Report is derived from aerial photographs (ICF, 1996a).

Historical aerial photographs of Site 58 are available covering the time period of 1945–1994. The photographs show evidence of past clearing and possible burrow pit activities at Site 58 during the late 1940s. In the 1954 photograph, low-lying vegetation covers much of the area and the access roads to the site are no longer visible. In the photographs from 1954 to 1994, no further clearing is evident, the site appears to be inactive, and vegetation is progressively reestablishing itself at the site (EA, 2007c).

Site 58 was further evaluated and described in the PA/SI report (EA, 2007b). Surface soil samples were collected and no potential risks to human health or the environment were identified at the site (EA, 2007c). A NFRAP Decision Document was finalized in September 2007.

Site 70

Site 70 has been evaluated in the following environmental reports:

- *Expanded Source Investigation/Visual Site Inspection Report, Andersen Air Force Base, Guam* (ICF, 1996a)
- *Installation Restoration Program, Final Records Search for Andersen Air Force Base, Guam* (ICF, 1996b)
- *Preliminary Assessment/Site Inspection for Ten IRP Sites at Northwest Field, Andersen Air Force Base, Guam* (EA, 2007b)

- *Final No Further Response Action Planned (NFRAP) Decision Document for Sites 56, 58, 70, and 73, Northwest Field, Andersen Air Force Base, Guam* (EA, 2007c)

Site 70 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). According to the Records Search Report, there is no documentation describing any disposal activities at the site (ICF, 1996a). Most of the historical information presented in the Records Search Report is derived from aerial photographs (ICF, 1996a).

Historical aerial photographs of Areas A and B are available covering the time period of 1945-1994. The photographs taken during the 1940s and 1950s were from high altitude, with poor resolution. While the photographs do show evidence of activity during the late 1940s, they do not provide enough detail to make a definitive determination of past disposal activities.

An undated aerial photograph taken between 1945 and 1948 shows a set of structures located approximately 200 feet southeast of the intersection of 17th and "M" Streets at Area A. The area appears to be active, with airplanes present on Service Apron 2097, approximately 150 feet to the north. The streets and ground surface adjacent to the site all appear to be cleared to bedrock. In the same photograph, numerous access roads and structures can be seen at Area B, bounded by 12th, 13th, "M", and "K" Streets. The ground surface surrounding the structures appears to be covered with low-lying vegetation.

An aerial photograph dated 16 July 1954 shows the structures at Area A are still present, but the surrounding area has been mostly covered by vegetation. Service Apron 2097 still appears to be clear, although inactive, with no airplanes present. In the same photograph the structures and access roads at Area B are still visible, with much of the surrounding area covered by vegetation.

An aerial photograph dated 1959 shows that the area consisting of Area A has become completely covered in vegetation since the previous photograph, with the structures no longer visible. However, the photograph does not show enough detail to determine whether the structures have been removed. At Area B, all of the structures and access roads are completely covered by and surrounded by vegetation, although 12th, 13th, "M", and "K" Streets are still visible.

An aerial photograph dated November 1994 shows Area A completely re-vegetated, with no access roads or structures present. Service Apron 2097 remains clear, with no signs of recent activity. In the same photograph, Area B is completely re-vegetated, with only a faint outline of 12th, "M", and "K" Streets remaining. No clearing activity appears to have occurred in or around the site since the previous photograph (EA, 2007c).

Site 70 was further evaluated and described in the PA/SI report (EA, 2007b). Surface soil samples were collected and no potential risks to human health or the environment were identified at the site (EA, 2007c). A NFRAP Decision Document was finalized in September 2007.

Site 73

Site 73 has been evaluated in the following environmental reports:

- *Expanded Source Investigation/Visual Site Inspection Report, Andersen Air Force Base, Guam* (ICF, 1996a)
- *Installation Restoration Program, Final Records Search for Andersen Air Force Base, Guam* (ICF, 1996b)
- *Preliminary Assessment/Site Inspection for Ten IRP Sites at Northwest Field, Andersen Air Force Base, Guam* (EA, 2007b)
- *Final No Further Response Action Planned (NFRAP) Decision Document for Sites 56, 58, 70, and 73, Northwest Field, Andersen Air Force Base, Guam* (EA, 2007c)

Site 73 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). According to the Records Search Report, there is no documentation describing any disposal activities at the site (ICF, 1996a). Most of the historical information presented in the Records Search Report is derived from aerial photographs (ICF, 1996a).

Historical aerial photographs and a reference drawing of Site 73 are available covering the time period of 1945–1994. The photographs taken during the 1940s and 1950s were from high altitude, with poor resolution. While the photographs do show evidence of clearing activity during the late 1940s, they do not provide enough detail to make a definitive determination of past disposal activities.

A reference drawing dated 1946 shows no structures or streets located in the vicinity of Site 73.

An undated aerial photograph taken between 1945 and 1948 shows a quarried area, approximately 100 feet by 400 feet in size, that appears to be cleared to bedrock. The quarry is located approximately 150 feet northwest of the 6th and "A" Street intersection.

In an aerial photograph dated 16 July 1954, the surface of the quarry still appears to be cleared to bedrock. The access road running perpendicular from 6th Street has been covered in vegetation since the last photograph. The other access road in the previous photograph that runs northwest from the intersection of 6th and "A" Streets still appears to be clear and has been extended to the south, where it connects to two additional cleared areas. These cleared areas are located approximately 3,000 and 3,500 feet to the south.

In the photographs from 1956 to 1994, no further clearing is evident, the site appears to be inactive, and vegetation is progressively reestablishing itself at the site.
Site 73 was further evaluated and described in the PA/SI report (EA, 2007b). Surface soil samples were collected and no potential risks to human health or the environment were identified at the site (EA, 2007c). A NFRAP Decision Document was finalized in September 2007.

2.3 Community Participation

NCP Section 300.430(f)(3) establishes a number of public participation activities that the lead agency must conduct following preparation of the Proposed Plan and review by the support agency. Components of these items and documentation of how each component was satisfied for Sites 48, 56, 58, 70, and 73 at Andersen AFB, Guam, are described in Tables 2-1 and 2-2.

Responses to comments received during the public comment period are included in the Responsiveness Summary, which is provided as Section 3 of the ROD.

2.4 Scope and Role of Operable Unit

As with many large sites, the environmental problems at Andersen AFB, Guam are complex. As a result, the USAF, with concurrence from the USEPA Region 9 and Guam EPA, has organized the environmental restoration work at Andersen AFB into six OUs as described below.

Main Base OU (Sites 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 25, 26, 27, 28, 29, 34, and 35) – RODs addressing the Main Base OU are currently underway. The sites are proposed to be addressed in seven separate ROD documents as follows:

- Sites 6, 9, and 12 (Group 1)
- Sites 5 and 8 (Group 2)
- Sites 4, 11, 25, 28, and 34 (Group 3)
- Sites 3, 10, 13, 14, 15, and 27 (Group 4)
- Site 2 (Group 5)
- Site 26
- Sites 29 and 35

Final RODs for Groups 1, 2, and 3 were completed in September 2007, and the RODs for the remaining sites are anticipated to be completed by July 2008.

Northwest Field OU (Sites 7, 16, 17, 21, 30, 31, and 36) – A Final ROD addressing Sites 7, 16, 17, 31, and 36 was completed in September 2007. It is anticipated that all remaining Northwest Field OU RODs will be completed by December 2008.

Marianas/Bonins Command (MARBO) Annex OU (Sites 20, 22, 23, 24, 37, and 38) – A Final ROD addressing the MARBO Annex OU was completed in May 1998 and a Five-year ROD Review was completed in July 2004.

Harmon Annex OU (Sites 18, 19, and 39) – A Final ROD addressing the Harmon Annex OU was completed in July 2002.

Urunao OU (Site 40) – A Final ROD addressing the Urunao OU was completed in December 2003.

Site Wide OU (Sites 41 through 78) – The Site Wide OU consists of IRP sites that have been added to the program in recent years and the sites are distributed geographically across the Main Base, Northwest Field, and MARBO Annex. RODs addressing these sites are anticipated to be completed in January 2009. The sites are proposed to be addressed in five separate ROD documents as follows:

- Sites 45, 49, 59, 61, 67, 67, 68, and 69 (Group A)
- Sites 48, 56, 58, 70, and 73 (Group B)
- Sites 47, 50, 51, 53, and 55 (Group C)

- Sites 57, 71, 72, 74, 75, and 76 (Group D)
- Sites 41, 42, 43, 62, 63, 64, 65, 66, 77, and 78 (Group E)

Due to presence of munitions and explosives of concern (MEC), two sites (52 and 60) are planned to be transferred to the Air Force's Military Munitions Response Program (MMRP). Under the MMRP, a ROD will be completed for these sites after further investigations/feasibility studies are completed with respect to MEC.

2.5 Site Characteristics

This section describes the physical characteristics of the five sites addressed in this ROD. Brief descriptions are provided for each site. Guam is the largest, most populated, and southernmost island in the Mariana Islands, located in the western Pacific Ocean (Figure 1-1). Relative to Guam, Hawaii is located 3,700 miles to the east-northeast and Japan is located 1,560 miles to the north. Guam is approximately 30 miles long, varies in width from 4 to 12 miles, and has a total land area covering approximately 209 square miles.

2.5.1 Physiography and Climate

Physiographically, the island of Guam may be divided into northern and southern regions, which are separated by the Adelup Fault. The northern region is a limestone plateau consisting of rolling hills and cliff lines ranging from 200 to 600 feet above mean sea level (msl).

Andersen AFB consists of multiple parcels of land located in Yigo, on the northern half of Guam (Figure 1-2), and is situated on an undulating limestone plateau with surficial karst features. The Base property includes the Main Base (formerly North Field) and the Northwest Field. It is approximately 8 miles wide by 2 to 4 miles long, and covers approximately 24.5 square miles.

Guam is located at 13° 27' north latitude (approximately 900 miles north of the equator), creating a year-round warm and humid climate. The mean annual temperature is 81 degrees Fahrenheit (°F). Daily temperatures range from the lower 70s to the upper 80s °F. Relative humidity ranges from 65 to 80 percent in the afternoon and 85 to 100 percent in the evening. Guam has two distinct seasons, a wet and a dry season. The dry season is typically from December to June, and the wet season occurs from July through November. Approximately 65 percent of the annual precipitation falls during these five rainy months, and the annual rainfall on northern Guam averages between 80 and 100 inches.

The dominant winds are the trade winds, blowing from the east or northeast with velocities between 4 and 12 miles per hour throughout the year. Storms may occur at any time during the year, although tropical storms and typhoons are more frequent during the rainy season. Large rainfall events associated with typhoons are common, with as much as 25 inches of rain in a 24-hour period (Ward et al., 1965).

These climatic conditions hold true for all sites covered by this ROD. Site-specific physiography is discussed in more detail in the sections below.

Site 48

Site 48 is situated in the Northwest Field, approximately 100 feet south of Route 3A. The site is covered with trees and low vegetation and contains four round and two rectangular tank berms. The site is relatively flat, with elevations ranging from 500 to 515 feet above msl.

Site 56

Site 56 Area A is located in a quarried area that contains a limestone rubble waste pile (approximately 90 feet by 20 feet) and a soil mound (approximately 80 feet by 80 feet) that is densely vegetated. The mounds are approximately 2 to 3 feet high. The site slopes to the south, with elevations ranging from 533 to 524 feet above msl.

Site 56 Area B contains a small asphalt pile (approximately 15 feet long by 5 feet wide by 2.5 feet high) in the center of the site. In general, Area B slopes gently to the south, with elevations ranging from approximately 504 to 508 feet above msl.

Site 58

Site 58 is a former borrow pit for crushed limestone sub base fill material that contains low-lying mounds of soil and limestone rubble in the middle of the site. The site slopes to the east, with elevations ranging from approximately 476 to 483 feet above msl.

Site 70

At Site 70 Area A, the primary surface feature is a waste pile situated in an open excavation or depression approximately 40 feet long by 12 feet wide by 3 to 4 feet deep. Two asphalt/concrete pads and a small mound are also present. The topography is relatively flat around the depression. Elevations range from approximately 474 feet in the bottom of the depression to 480 feet above msl along the site perimeters.

Site 70 Area B consists of a low-lying waste pile that covers a 400-foot by 200-foot area along "K" and 13th Streets. The topography slopes west-northwest, with elevations ranging from approximately 492 feet at the top of the waste pile in the eastern part of the site to 480 feet above msl in the western corner.

Site 73

Site 73 consists of a drum pile situated on the north edge of a densely vegetated quarry area. The drums occur in an irregular pile that covers a 20-foot by 30-foot area near the center of the site. The site topography slopes east, with elevations ranging from approximately 493 feet in the western part of the site to 485 feet above msl in the eastern part.

2.5.2 Geology and Hydrogeology

The geology of the Northwest Field consists of the Mariana and Barrigada Limestones, which are underlain at depth by the volcanic rocks of the Alutom Formation:

- The Barrigada Limestone consists of massive, well-lithified to friable, medium- to coarse-grained, white, foraminiferal limestone.
- The Mariana Limestone Detrital Facies consists of well-lithified to friable, fine- to coarse-grained, white, detrital limestone.
- The Mariana Limestone Molluscan Facies consists of well-lithified to friable, fine- to medium-grained limestone of lagoonal origin containing abundant casts and molds of pelecypods.

The younger Mariana Limestone overlies the Barrigada Limestone and is exposed on the surface of most of the northern plateau. Karst features such as sinkholes and caves have formed within the limestone formations by hydrologic processes.

Soils formed on the limestone surface of the portion of the northern plateau where Northwest Field and the Main Base are located consist predominantly of the following three series of upland limestone soils: Guam, Guam Urban Land Complex, and Ritidian-Rock Outcrop Complex:

- The Guam cobbly clay loam is derived from sediments overlying porous coralline limestone. It is neutral to mildly alkaline with moderately rapid permeability. The surface layer is usually removed or mixed with underlying material during construction. The soil is composed of dusky red, gravelly, clay loam. The depth to limestone is usually 2 to 10 inches, unless landscaping has taken place.
- The Guam-Urban land complex is commonly composed of 55 percent Guam cobbly clay loam and 45 percent urban land. The percentage varies from one area to another. Most areas have been disturbed by land shaping for urban development and the surface layer has typically been removed and mixed with underlying materials during construction. The subsoil is composed of dusky red, cobbly clay loam with the depth to limestone usually within 2 to 10 inches. The soil is neutral to mildly alkaline, and well drained with moderately rapid permeability.
- The Ritidian-Rock outcrop complex at 15 to 60 percent slopes is on dissected limestone plateaus and escarpments with irregular or elongated shapes. This soil type is composed of 50 percent Ritidian extremely cobbly clay loam and 45 percent rock outcrop and is a derivative of coralline limestone. The depth to limestone usually within 2 to 10 inches. The soil is mildly to moderately alkaline, is dark reddish brown, and moderately permeable.

These soils are generally very shallow to shallow, well-drained, and range from flat to gently sloping on the interior to extremely steep along the cliff lines (Young, 1988).

On the northern half of Guam, groundwater occurs at depth in the porous limestone deposits of the Barrigada and Mariana Limestones. The aquifer, called the Northern Guam Lens, occurs as a freshwater lens floating on seawater (Barrett, Harris, & Associates, 1982). Water table elevations range from near sea level at coastal areas to a maximum of approximately 6 feet above msl. The groundwater flows through openings and fissures in the highly permeable limestone and ultimately discharges along the coastline.

The following is a tabular summary of the geology and hydrogeology at Sites 48, 56, 58, 70, and 73.

Site	Limestone Formation	Soil	Depth to Groundwater (approximate)	Direction of Groundwater Flow*
Site 48	Detrital facies of the Mariana Limestone	Guam cobbly-clay loam	510 feet bgs	West
Site 56	Detrital facies of the Mariana Limestone	Guam-Urban land complex	Area A: 524 feet bgs Area B: 502 feet bgs	Northwest
Site 58	Molluscan facies of the Mariana Limestone	Guam-Urban land complex	474 feet bgs	West-northwest
Site 70	Detrital facies of the Mariana Limestone	Guam-Urban land complex	Area A: 475 feet bgs Area B: 485 feet bgs	South
Site 73	Molluscan facies of the Mariana Limestone	Guam cobbly clay loam	85 feet bgs	South-southeast

* Source: EA, 1998b
bgs = below ground surface

2.5.3 Surface Water Hydrology

No wetlands or surface water are located in the vicinity of Sites 48, 56, 58, 70, or 73. The geology in the region is dominated by highly porous limestone bedrock located below very shallow soils with moderately rapid permeability. As a result, storm water runoff is slow and precipitation readily infiltrates into the vadose zone, preventing the formation of surface streams, rivers, and lakes.

2.5.4 Ecology

Site 48

Site 48 is located in the Northwest Field near several areas considered as critical habitats for several plants and animals. The ecological habitat at Site 48 consists of mixed shrub and secondary growth limestone forest. A mixture of vines, herbs (up to 3 feet tall), shrubs and small trees (3 to 10 feet tall), and larger trees (10 to 30 feet tall) were found in this habitat. The endangered fire tree (*Hayun-lago*) and ufa halomtano (*Heritiera longipetiolata*) have been observed in the Northwest Field; however, no known threatened or endangered species were observed at Site 48.

Site 56

Site 56 is located in the Northwest Field near several areas considered as critical habitats for several plants and animals. The ecological habitat at Site 56 consists primarily of mixed shrub and mixed herb habitat. The endangered fire tree (*Hayun-lago*) and ufa halomtano (*Heritiera longipetiolata*) have been observed in the Northwest Field; however, no known threatened or endangered species were observed at Site 56.

Site 58

Site 58 is located in the Northwest Field to the south of South Runway. Areas near the site are considered critical habitats for several plants and animals. The ecological habitat at the site consists primarily of mixed shrub and mixed herb habitat. The endangered fire tree (*Hayun-lago*) and ufa halomtano (*Heritiera longipetiolata*) have been observed in the Northwest Field; however, no known threatened or endangered species were observed at Site 58.

Site 70

Site 70 is located in the Northwest Field near or in the Guam National Wildlife Refuge and several areas previously proposed as critical habitat for the endangered fire tree (*Hayun-lago*), ufa halomtano (*Heritiera longipetiolata*), Mariana crow (*Corvus kubaryi*), and Mariana fruit bat (*Pteropus mariannus mariannus*). The ecological habitat at the site consists primarily of limestone forest with sparse undergrowth beneath the canopy of taller trees. The fire tree and ufa halomtano have been observed in the Northwest Field; however, no known threatened or endangered species were observed at Site 70.

Site 73

Site 73 is located near the Guam National Wildlife Refuge and several areas previously proposed as critical habitat for the endangered fire tree (*Hayun-lago*), ufa halomtano (*Heritiera longipetiolata*), Mariana crow (*Corvus kubaryi*), and Mariana fruit bat (*Pteropus mariannus mariannus*). The ecological habitat at the site consists primarily of limestone forest with sparse undergrowth beneath the canopy of taller trees. The fire tree and ufa halomtano have been observed in the Northwest Field; however, no known threatened or endangered species were observed at Site 73.

2.5.5 Previous Site Characterization Activities

Site 48

Previous site characterization activities at Site 48 include the Phase II EBS (EA, 1998a) and the RI (EA, 2007a). During the Phase II EBS conducted in 1996, seventeen soil gas samples were collected and analyzed for volatile organic compounds (VOCs) using an onsite gas chromatograph/mass spectrometer. No VOCs were detected in any of the soil gas samples. Eleven surface soil samples (eight composite and three discrete) were collected from 2 to 4 inches bgs and analyzed for semivolatile organic compounds (SVOCs) and target analyte list (TAL) metals. Analytical results indicated the presence of two PAHs (benzo(a)pyrene and

benzo(b)fluoranthene) and one metal (lead) in surface soil at concentrations above risk-based screening levels (residential PRGs and BTVs):

- Benzo(a)pyrene was detected in two samples (120 and 400 micrograms per kilogram [µg/kg]) at concentrations exceeding the residential PRG (62 µg/kg).
- Benzo(b)fluoranthene was detected in one sample (640 µg/kg) at a concentration exceeding the residential PRG (620 µg/kg).
- Lead was detected in two samples (550 and 2,220 milligrams per kilogram [mg/kg]) at concentrations exceeding the residential PRG (400 mg/kg).

Based on the results of the Phase II EBS, an RI field investigation was conducted at Site 48 in 2005 (EA, 2007a). The RI consisted of a site reconnaissance, a detailed site inventory (DSI), surface soil sampling, and subsurface soil sampling from test pits. Forty-one surface soil samples (including four field duplicates) were collected and analyzed for polycyclic aromatic hydrocarbons (PAHs) and/or lead. No PAHs were detected in the surface soil samples at concentrations exceeding residential PRGs. Analytical results indicated the presence of one metal (lead) in surface soil at concentrations exceeding risk-based screening levels:

- Lead was detected in two samples (450 and 819 mg/kg) at concentrations exceeding the residential PRG (400 mg/kg).

Nine test pits were excavated to depths ranging from approximately 0.8 to 5.5 feet bgs and from 5 to 8.8 feet in length. No debris was encountered in any of the test pits. Eight subsurface soil samples were collected from test pits; five samples were analyzed for PAHs and three samples were analyzed for lead. Analytical results indicated PAHs and lead were not detected in the subsurface soil samples at concentrations exceeding residential PRGs.

The analytical results for the surface and subsurface soil samples collected during the RI were used to conduct an HHRA and SLERA. The HHRA and SLERA concluded that there are no unacceptable risks to future residential or ecological receptors. Therefore, Site 48 is suitable for unlimited use and unrestricted exposure. No further actions are required at the site.

Site 56

Site 56 was identified in the Expanded Source Investigation/Visual Site Inspection (ESI/VSI) report (ICF, 1996a) and the Records Search report (ICF, 1996b). The evaluations focused on identifying areas that generated, stored, or disposed of solid wastes and determining the potential impact from hazardous waste to human health and the environment. The evaluations included visual inspections of the areas, a records search to determine the history and operation of the areas, and a regulatory review to evaluate the appropriate program under which the USAF should investigate and close the site.

A PA/SI was conducted at Site 56 Areas A and B between October 2006 and January 2007 (EA, 2007b). The PA/SI consisted of a records search, a DSI that included a site reconnaissance and location survey, and surface soil sampling. At Area A, the DSI identified surface debris

consisting of drum remnants, miscellaneous metal debris, and glass soda bottles. Additionally, an open pit (approximately 8 feet deep), and a mounded area (15 feet wide) were observed within Area A, although no debris was present in the pit or on the surface of the mound. At Area B, the DSI identified an asphalt pile next to the quarried area and other wastes that include miscellaneous automotive debris and scattered soda bottles.

Four surface soil samples were collected from each area and analyzed for PAHs, pesticides, polychlorinated biphenyls (PCBs), and TAL metals. Samples were not analyzed for explosive residues because items related to munitions and explosives of concern were not identified. Of the eight surface soil samples collected from Site 56, the only analyte that exceeded a screening level (residential PRGs and background threshold values [BTVs]) was aluminum in one sample, and it was only slightly higher than the BTV. This surface soil sample was intentionally collected from outside of the Area B boundary as a background reference sample. Therefore, the aluminum detected in the sample is consistent with background aluminum in the area.

Based on the findings of the PA/SI, no potential unacceptable risks to human health or the environment were identified at the site. Site 56 was recommended for NFRAP, as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred.

Site 58

Site 58 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). The evaluations focused on identifying areas that generated, stored, or disposed of solid wastes and determining the potential impact from hazardous waste to human health and the environment. The evaluations included a visual inspection of the area, a records search to determine the history and operation of the area, and a regulatory review to evaluate the appropriate program under which the USAF should investigate and close the site.

A PA/SI was conducted at Site 58 between November 2006 and January 2007 (EA, 2007b). The PA/SI consisted of a records search, a DSI that included a site reconnaissance and location survey, a geophysical survey, and surface soil sampling. The DSI identified a mounded area in the middle of the site that extends slightly past the site boundary. The mound varies in thickness from 2 to 4 feet high and is approximately 30 feet wide. The mound is a mix of soil and limestone rubble with pieces of corrugated metal in and on top of the mound. Along the mound is an area of severely deteriorated drum remnants and rusted corrugated metal pieces.

An electromagnetic (EM) geophysical survey was performed at the site using a Geonics® EM-31 instrument. The EM geophysical survey was conducted by taking initial EM measurements at approximately 100-foot intervals along lines spaced 25 feet apart and parallel to the 100-foot orthogonal grid lines established at the site. The EM survey identified numerous anomalies in one area of the site related to the metallic surface debris observed during the DSI. In addition, an isolated area of anomalies that did not coincide with metallic surface debris was identified. A test ditch was excavated to confirm the presence of buried metallic material and a buried cable was revealed—the likely cause of the magnetic anomalies.

Eleven surface soil samples were collected at Site 58 and analyzed for PAHs, pesticides, PCBs, and TAL metals. None of the analytical results exceeded screening criteria (residential PRGs and BTVs). There are no contaminants present at Site 58 at concentrations that pose unacceptable risks to human health or the environment, and the land is free for unrestricted use and unlimited access. Therefore, the site was recommended for NFRAP, as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred.

Site 70

Site 70 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). The evaluations focused on identifying areas that generated, stored, or disposed of solid wastes and determining the potential impact from hazardous waste to human health and the environment. The evaluations included visual inspections of the areas, a records search to determine the history and operation of the areas, and a regulatory review to evaluate the appropriate program under which the USAF should investigate and close the site.

A PA/SI was conducted at Site 70 Areas A and B between November 2006 and February 2007 (EA, 2007b). The PA/SI consisted of a records search, a DSI that included a site reconnaissance and location survey, and surface soil sampling. At Area A, the DSI identified two asphalt/concrete pads, a small mound, and a waste pile situated in an open depression that is approximately 40 feet long by 12 feet wide and 3 to 4 feet deep. Waste observed in the excavation mainly included rusted metal mixed with crushed limestone and soil. At Area B, the DSI identified a large waste pile with surface debris consisting of a potential drum remnant; a corroded electrical breaker box; a 200-gallon water heater tank; corroded metal debris; concrete debris; and a wooden telephone pole. Small areas of tar were also observed at Area B.

Nine surface soil samples were collected from Area A and five surface soil samples were collected from Area B. The samples were analyzed for PAHs, pesticides, PCBs, and TAL metals. None of the analytical results exceeded screening criteria (residential PRGs and BTVs). There are no contaminants present at Site 70 at concentrations that pose unacceptable risks to human health or the environment, and the land is free for unrestricted use and unlimited access. Therefore, the site was recommended for NFRAP, as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred.

Site 73

Site 73 was identified in the ESI/VSI report (ICF, 1996a) and the Records Search report (ICF, 1996b). The evaluations focused on identifying areas that generated, stored, or disposed of solid wastes and determining the potential impact from hazardous waste to human health and the environment. The evaluations included a visual inspection of the area, a records search to determine the history and operation of the area, and a regulatory review to evaluate the appropriate program under which the USAF should investigate and close the site.

A PA/SI was conducted at Site 73 between November 2006 and January 2007 and the results are presented in the PA/SI report (EA, 2007b). The PA/SI consisted of a records search, a DSI that

included a site reconnaissance and location survey, and surface soil sampling. The DSI identified approximately 16 empty, corroded, 55-gallon steel drums in an irregular pile that covers a 20-foot by 30-foot area near the center of the site. The majority of the drums were severely corroded and perforated, and some had obvious puncture marks. None of the drums were still capable of holding liquids. The drums were not marked and their former contents are unknown. Additionally, an area of asphalt material was observed west of the drum pile.

Seven surface soil samples were collected at the site and analyzed for PAHs, pesticides, PCBs, and TAL metals. Of the seven surface soil samples collected from Site 73, only iron was detected at a concentration exceeding the risk screening levels (residential PRGs and BTVs). Iron was detected in one sample at a concentration of 117,000 mg/kg, exceeding the BTV of 116,495 mg/kg. Iron is an essential nutrient of low toxicity, and its reported maximum concentration is unlikely to be associated with adverse health impacts. There are no contaminants present at Site 73 at concentrations that pose unacceptable risks to human health or the environment, and the land is free for unrestricted use and unlimited access. Therefore, the site was recommended for NFRAP, as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred.

2.5.6 Nature and Extent of Contamination

Site 48

Analytical results for soil samples collected at Site 48 during the Phase II EBS and RI indicated that two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) and lead exceeded screening levels in a few surface soil samples. No PAHs or lead were detected in the subsurface soil samples at concentrations exceeding screening levels. Results of the HHRA and SLERA indicated that the PAH and lead exceedances in surface soil do not pose unacceptable risks to either human or ecological receptors. Therefore, Site 48 is suitable for unlimited use and unrestricted exposure. No further action is required at the site.

Site 56

Surface soils were evaluated for potential contamination as a result of historical disposal activities at the site. Analytical results for the soil samples indicated aluminum slightly exceeding the BTV in one sample; the sample was collected outside of the Area B boundary as a background reference sample. Therefore, it was inferred that the aluminum detected in the sample was consistent with background aluminum in the area and that the exceedance does not pose an unacceptable risk to human health and the environment.

The site was designated as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred. A NFRAP Decision Document was prepared in 2007 (EA, 2007c), which allows for unlimited use of and unrestricted exposure to the land.

Site 58

Surface soils were evaluated for potential contamination as a result of historical disposal

activities at the site. None of the analytical results for the soil samples exceeded the screening levels (residential PRGs and BTVs); therefore, no unacceptable risks to human health and the environment were identified.

The site was designated as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred. A NFRAP Decision Document was prepared in 2007 (EA, 2007c), which allows for unlimited use of and unrestricted exposure to the land.

Site 70

Surface soils were evaluated for potential contamination as a result of historical disposal activities at the site. None of the analytical results for the soil samples exceeded the screening levels (residential PRGs and BTVs); therefore, no unacceptable risks to human health and the environment were identified.

The site was designated as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred. A NFRAP Decision Document was prepared in 2007 (EA, 2007c), which allows for unlimited use of and unrestricted exposure to the land.

Site 73

Surface soils were evaluated for potential contamination as a result of historical disposal activities at the site. Analytical results for the soil samples indicated that iron was detected in a single sample at a concentration that slightly exceeded the BTV. Iron is an essential nutrient of low toxicity, and its reported maximum concentration is unlikely to be associated with adverse health impacts. It was concluded that the single exceedance does not pose an unacceptable risk to human health and the environment.

The site was designated as a property where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from adjacent areas occurred. A NFRAP Decision Document was prepared in 2007 (EA, 2007c), which allows for unlimited use of and unrestricted exposure to the land.

2.5.7 Conceptual Site Model

Conceptual site models (CSMs) were developed for Site 48 to depict the potential relationship or exposure pathway between chemical sources and receptors. An exposure pathway describes the means by which a receptor can be exposed to contaminants in environmental media. These pathways are presented in Figures 2-9 and 2-10, and are based upon current and reasonably likely future land use at Site 48. Although future residential land use is considered unlikely at Site 48, residential adult and child receptors were evaluated in the HHRA as a conservative measure to determine whether the site would be suitable for unrestricted use or unlimited exposure, as described within this ROD.
CSMs were not developed for Sites 56, 58, 70, and 73. The analytical results for soil samples collected at the sites during site investigation activities were compared to established risk

risk screening levels (residential PRGs and BTVs). Based on the risk screening, Sites 48, 56, 58, 70, and 73 are considered NFRAP Decision sites, where no unacceptable risks to human health or the environment were identified. Therefore, baseline human health and ecological risk assessments were not conducted for Sites 48, 56, 58, 70, and 73, and CSMs were not developed.

2.6 Current and Potential Future Land and Resource Uses

2.6.1 Land Use

As the lead agency, the USN has the authority to determine the future anticipated land use. The following is summary of current land use conditions at the five sites, as well as surrounding land use.

Site	Current Land Use	Surrounding Land Use
Site 48	Training Area (USAF, 2006)	Land adjacent to and surrounding Site 48 is designated as a training area. Land to the north, across Route 3A, is designated for aircraft operations and maintenance, and land to the east, across Route 3A, is designated for administrative use.
Site 56	Military Training Area (USAF, 2006)	Land to the north of Site 56 is designated as aircraft operations and maintenance, and land to the south is designated as airfield.
Site 58	Airfield (USAF, 2006)	Land immediately surrounding Site 58 is designated as airfield. Several hundred feet south of the site, land use is designated as aircraft operations and maintenance.
Site 70	Open space (USAF, 2006)	Land several hundred feet north of Area A is designated as aircraft operations and maintenance. Land several hundred feet east of Area A is designated as industrial. Land immediately west of Area B is designated for administrative use.
Site 73	Open space (USAF, 2006)	Land to the west of Site 73 is designated for administrative use. Land to the north, south, and east of Site 73 is designated as open space.

Land use for the five sites, as well as adjacent and surrounding land, is expected to remain the same for the foreseeable future.

2.6.2 Ground and Surface Water Uses

All sites covered under this ROD are located on the Northern Guam Lens aquifer, which is designated by the USEPA as a sole source aquifer, and supplies Guam with approximately 80 percent of its drinking water (Barrett, Harris, & Associates, 1982). Groundwater at the Northwest Field OU has been monitored regularly as part of the Long-term Groundwater Monitoring (LTGM) Program at Andersen AFB (EA, 2007d) The initial round of groundwater sampling was collected for all the Northwest Field monitoring wells in November 1995

(Round 1) and on a semiannual basis (twice a year) thereafter. During the May 1999 Remedial Program Managers (RPM) meeting held in Hawaii (USAF, 1999), the USAF, USEPA, and Guam EPA reviewed the historical groundwater data and agreed to remove 10 monitoring wells, located in the Northwest Field OU, from the LTGM Program. Monitoring wells IRP-21, IRP-22, IRP-44, IRP-45a, IRP-46, IRP-47; USGS-33, USGS-99, TH-B, and TH-C were removed from the LTGM Program because no contaminants of concern had been detected in any groundwater samples at concentrations exceeding Maximum Contaminant Levels (EA, 1999). Though no contaminants of concern had been detected in the groundwater samples collected from monitoring wells IRP-43 and USGS-56, semiannual monitoring was continued until the removal actions at Sites 16 and 31 were completed. These wells were monitored in the event that either removal action mobilized contamination that migrated to groundwater. After completion of the removal actions, groundwater sampling in these two wells was discontinued as per the agreement of the RPM (USAF, 2001).

The historical groundwater data set for the Northwest Field established that there is no connection between the five IRP sites and any groundwater contamination.

No surface water is located in the vicinity of Sites 48, 56, 58, 70, or 73.

2.7 Summary of Site Risks

This section summarizes the approach and findings of the HHRA and SLERA performed for Site 48, and is included as the basis for no further action at the site. The CSMs developed for the HHRA and SLERA for Site 48 are presented in Figures 2-9 and 2-10, respectively.

Based on the risk screening using analytical results for soil samples collected at Sites 56, 58, 70, and 73 and screening levels (residential PRGs and BTVs), no unacceptable risk to human health or the environment were identified. Therefore, baseline human health and ecological risk assessments were not conducted for Sites 56, 58, 70, and 73, and NFRAP decisions were recommended for the sites. A draft NFRAP Decision Document for Sites 56, 58, 70, and 73 was prepared in September 2007 (EA, 2007c), and is expected to be finalized in December 2007.

2.7.1 Summary of Human Health Risk Assessment for Site 48

An HHRA was performed for Site 48 as an element of the RI (EA, 2007a). The HHRA identified surface and subsurface soil as the media of concern at Site 48, and risks were estimated for the following receptors:

- Industrial worker exposure to surface soil
- Construction worker exposure to subsurface soil
- Resident (adult and child) exposure to surface and subsurface soil

The risk-based screening results for the receptors and media of concern at Site 48 are summarized as follows:

- Lead was the only contaminant of potential concern (COPC) identified for resident and industrial worker exposures to surface soil.
- No COPCs were identified for resident and construction worker exposures to subsurface soil.

The maximum detected concentration of lead in surface soil (819 mg/kg) exceeded the screening value for lead for residential and industrial receptors (400 and 800 mg/kg, respectively). Therefore, lead was retained as a COPC in surface soil for residential and industrial receptors.

There are no toxicity values published by the USEPA for quantifying cancer risks from lead, using the standard HHRA methodology. Infants and young children are the most vulnerable populations exposed to lead and have been the focus of USEPA's risk assessment efforts. USEPA has published the Integrated Exposure Uptake Biokinetic Model (IEUBK) for assessing risks from lead exposure in children. The IEUBK Model is used to estimate blood lead concentrations resulting from exposure to environmental sources (USEPA, 1994).

USEPA has created a software program of the IEUBK Model to predict blood lead levels in children ages 0 to 84 months (USEPA, 1994). The most current software is LEAD version 0.99D (LEAD99D). LEAD99D was used in this assessment to estimate blood lead levels in children at this site. The model output is a probability distribution function describing the percentage of children predicted to have blood levels exceeding 10 micrograms per deciliter (µg/dL). USEPA has established a risk target of 90 percent of the population with a blood lead level of less than 10 µg/dL.

The USEPA Region 9 residential PRG for lead in soil (400 mg/kg) is based on the output of the IEUBK Model, using conservative default parameters for resident children (USEPA, 1994). It represents a safe soil lead concentration for the most conservative receptor and exposure assumptions. The average lead concentration for surface soil at Site 48 was 254 mg/kg, which was less than the risk target of 400 mg/kg (Table 2-3). Therefore, lead in surface soil at Site 48 does not pose unacceptable risks to potential future receptors at the site.

In summary, no cancer or non-cancer risks exceeded the USEPA's risk targets for residents or industrial workers exposed to surface soil, or residents or construction workers exposed to subsurface soil at Site 48.

Uncertainties Assessment

Numerous uncertainties are involved in the HHRA process. These are discussed briefly below.

Sampling and Analysis Uncertainties

The sampling plan can have a significant impact on the results obtained in calculating human health risks at a site. To the extent that samples are collected in areas that are expected to be

contaminated (biased sampling), the exposure point concentration (EPC) used in calculating risk exposures and risks is likely to overestimate the actual concentration encountered at the site from random exposure across the site. This sampling bias will generally result in an overestimate of exposures and risks at a site. The soil sampling at Andersen AFB incorporated a combination of random and biased samples. As the majority of soil samples collected at Andersen AFB are biased toward potentially contaminated areas, the detected concentrations and calculated health risks would tend to be overestimated.

Chemical Fate and Transport Modeling Uncertainties

The models used to estimate chemical concentrations associated with particulates in air at Andersen AFB are consistent with those recommended by USEPA (1996). However, due to uncertainties in modeling methodologies, USEPA-recommended models are likely to overestimate actual concentrations at the site. Thus, use of models is likely to result in overestimates of health risks at Andersen AFB.

Uncertainties of Toxicity Assessment

Numerous uncertainties are associated with the toxicity assessment. These are generally due to the unavailability of data to thoroughly calculate the toxicity of COPCs.

Uncertainties Analysis of Exposure Assessment

Soil Ingestion Rate

Soil ingestion rates for children are based on studies performed by Binder et al. (1986) and Clausing et al. (1987). Methods used in both studies involved the measurement of trace elements found in soil, and known to be poorly absorbed by the gut, in soils and the feces of children. Both were short-term studies, and as they were not based on average long-term exposures, they represent an overestimate of exposure. More recent published data have shown that average soil ingestion rates for two-year-olds is less than 100 mg/day (Calabrese et al., 1989; Davis et al., 1990). Furthermore, USEPA soil ingestion rates for children ages 1 to 6 are based on ingestion rates for children at age 18 months and are applied through age 6 years (USEPA, 1989). This is very unlikely because children over 2 years old do not ingest at the same rate as an 18-month-old. Additionally, a conservative estimate was used for the fraction ingested (value of 1.0), which assumes that all soil ingested (for residential exposures) is ingested at the residence. This assumes that no activities take place elsewhere. Taken together, these suggest that intakes for this pathway are overestimated.

Exposure Duration

USEPA assumes residential exposure duration for adults is 30 years, which represents the USEPA-derived 90th percentile upper limit for time spent at one residence. The average (50^{th} percentile) time spent at one residence is seven years. These values are recommended in the *Risk Assessment Guidance for Superfund* (USEPA, 1989). Soil ingestion for children age 1 to 6 is assumed to continue for the entire 6-year time frame.

Uncertainties in Risk Characterization

Uncertainties in the risk characterization can stem from the inherent uncertainties in the data evaluation, the exposure assessment process, including any modeling of EPCs in secondary media from primary media, and the toxicity assessment process. The individual uncertainties in these respective processes were addressed in the previous sections.

2.7.2 Summary of Ecological Risk Assessment for Site 48

An extensive qualitative habitat and biota survey was conducted at Site 48 as part of the RI (EA, 2007a). Based on results of the survey, the ecological receptors of concern were identified as terrestrial plants, terrestrial invertebrates (earthworms), and terrestrial avian species (Mariana crow and yellow bittern). Surface soil was identified as the only media of concern.

To identify the ecological COPCs at Site 48, the maximum detected concentrations from surface soil samples collected at Site 48 were compared to screening values. The comparison was conducted by dividing the site maximum concentration by the screening value to produce a screening quotient ratio (SQR). The SQR is a unitless ratio that reflects the relationship of the maximum site concentration to the screening value. If the site maximum was less than the screening value (SQR < 1.0), that analyte was eliminated as a COPC. If the site maximum exceeded the screening value (SQR > 1.0), that analyte was retained as a COPC. Comparisons of the maximum concentrations to screening levels identified lead (SQR = 16.4) as an ecological COPC in surface soil at Site 48.

The ecological COPC (lead) was further evaluated for each receptor of concern by calculating the mean EPC, and comparing the mean EPC to conservative literature-based toxicity reference values. Lead was evaluated further as part of the risk characterization for plants, soil invertebrates, and avian wildlife.

Based on the results of the SLERA, no unacceptable risks were identified for terrestrial plants, terrestrial invertebrates, or terrestrial avian species as a result of exposure to the COPCs present at Site 48. No ecological contaminants of concern were identified for Site 48.

2.7.3 Basis for No Further Action

No unacceptable risks to public health or welfare or the environment were identified at Sites 48, 56, 58, 70, and 73; therefore, no action is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

2.8 Statutory Authority Finding

Because the soil sample analytical results for Sites 48, 56, 58, 70, and 73 indicate that there are no unacceptable risks to human or the environment, the USN has determined that no CERCLA remedial action is necessary at the sites.

Findings of previous site investigations resulted in NFRAP recommendations at Sites 56, 58, 70, and 73. A NFRAP Decision Document designating the sites as properties where hazardous or petroleum products or their derivatives were stored, but no release, disposal or migration from

adjacent areas occurred, was prepared in 2007 (EA, 2007c). Therefore, no action is required for any of these sites to allow for unlimited use of and unrestricted exposure to the land.

Because there are currently no hazardous substances, pollutants, or contaminants at the sites above levels that would allow for unlimited use and unrestricted exposure, a five-year review is not required.

2.9 Documentation of Significant Changes

The Proposed Plan for Sites 48, 56, 58, 70, and 73 was released for public comment on 31 July 2008. The Proposed Plan identified "No action" as the selected remedy. The USN reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

Table 2-1
Public Notification of Document Availability.

Requirement:	Satisfied by:
Notice of availability of the Proposed Plan must be made in a widely-read section of a major local newspaper.	Notice of availability of the Proposed Plan was published in the *Guam Pacific Daily News* on *July 30, 2008.*
Notice of availability should occur at least two weeks prior to the beginning of the public comment period.	The public comment period began on *July 31, 2008.*
Notice of availability must include a brief abstract of the proposed plan which describes the alternatives evaluated and identifies the preferred alternative [NCP Section 300.430(f)(3)(i)(A)].	Notice of availability included all of the applicable components and is included in Appendix A of this ROD.
Notice of availability should consist of the following information: • Site name and location • Date and location of public meeting • Identification of lead and support agencies • Alternatives evaluated in the detailed analysis • Identification of preferred alternative • Request for public comments • Public participation opportunities including: o Location of information repositories and AR file o Methods by which the public may submit written and oral comments, including a contact person o Dates of public comment period o Contact person for the Restoration Advisory Board	See notice in Appendix A.

Notes:
AR = Administrative Record
NCP = National Oil and Hazardous Substances Pollution Contingency Plan of 1990
ROD = Record of Decision

Table 2-2
Public Comment Period Requirements.

Requirement:	Satisfied by:
Lead agency (USAF) should make document available to public for review on same date as newspaper notification.	Document was made available to the public on *July 31, 2008.* The notification of availability was made on *July 30, 2008.*.
Lead agency (USAF) must ensure that all information that forms the basis for selecting the response action is included as part of the AR file and made available to the public during the public comment period.	The USAF maintains information repositories for the Andersen AFB AR file at the Robert F. Kennedy Library at the University of Guam and the Nieves M. Flores Memorial Library in Hagåtña. In addition, the AR file for Andersen AFB is also available on the web at: www.adminrec.com. Data and supporting CERCLA primary documents produced for Andersen AFB are maintained as part of these files and are available to the public.
CERCLA Section 177(a)(2) and NCP Section 300.430(f)(3)(i) require the lead agency (USAF) to provide the public with a reasonable opportunity (30 days) to submit written and oral comments on the Proposed Plan.	The USAF provided a public comment period for the Proposed Plan from *July 31, 2008* to *August 31, 2008.*
The lead agency (USAF) must extend the public comment period by at least 30 additional days upon timely request.	The USAF received no requests to extend the public comment period.
The lead agency (USAF) must provide a public meeting to be held at or near the site during the public comment period. A transcript of this meeting must be made available to the public and be maintained in the AR for the site (pursuant to NCP Section 300.430(f)(3)(i)(E)).	A public meeting was held on *August 14, 2008* at the *Guam Marriott Resort and Spa*. A transcript of this meeting has been added to the AR file.

Notes:
AFB = Air Force Base
AR = Administrative Record
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
NCP = National Oil and Hazardous Substances Pollution Contingency Plan of 1990
USAF = United States Air Force

Table 2-3
Summary of Contaminants of Potential Concern and Medium-Specific Exposure Point Concentrations for Site 48.

Media	Contaminant of Potential Concern	Concentration Detected		Units	BTV	2004 USEPA Region 9 PRG		Frequency Of Detection	Exposure Point Concentration	Statistical Measure
		Minimum	Maximum			Residential	Industrial			
Soil On-Site - Direct Contact - Surface Soil	Lead	37.1	819	mg/kg	166	400	800	12/12	254	Mean

Notes:
Mean = Arithmetic mean
BTV = Background Threshold Value
mg/kg = milligram(s) per kilogram
PRG = Preliminary Remediation Goal
USEPA = United States Environmental Protection Agency

PHILIPPINE SEA

Northwest Field

USGS-99

SITE 56-AREA A

SITE 56-AREA B

IRP-44

SITE 58

USGS-33

SITE 70-AREA A

SITE 70-AREA B

SITE 48

IRP-43

EX-8 (BLOCKED)

USGS-56

SITE 73

3.5'

4.0'

4.5'

5.0'

5.5'

NORTH TAXIWAY

NORTH RUNWAY

SOUTH RUNWAY

TAXIWAY

INACTIVE

CENTER TAXIWAY

SOUTH TAXIWAY

JET 3

A STREET

B STREET

C STREET

D STREET

E STREET

F STREET

G STREET

H STREET

I STREET

J STREET

K STREET

L STREET

10TH STREET

12TH STREET

13TH STREET

14TH STREET

15TH STREET

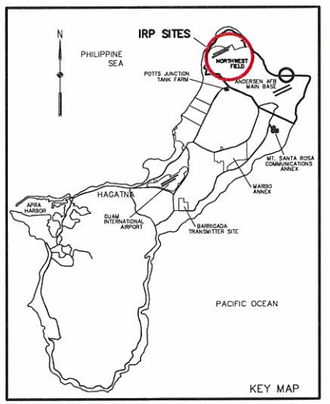
16TH STREET

17TH STREET

18TH STREET

Andersen AFB Boundary

Andersen AFB Main Base/Munition Storage Area



LEGEND:

- IRP SITE LOCATIONS
- MONITORING WELL
- EXPLORATORY BOREHOLE
- ANDERSE AIR FORCE BASE BOUNDARY
- NORTHWEST FIELD/MUNITIONS STORAGE AREA BOUNDARY
- ASPHALT ROADWAYS PAVEMENT
- 5.5' GROUNDWATER CONTOUR LINE ABOVE MLLW (MEAN LOWEST LOW WATER) BASED ON "SHALLOW" MONITORING WELLS (FALL 2006)

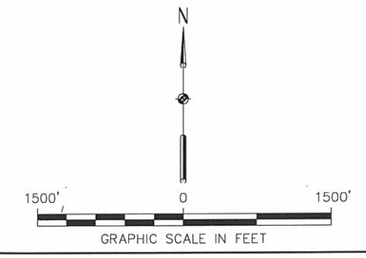
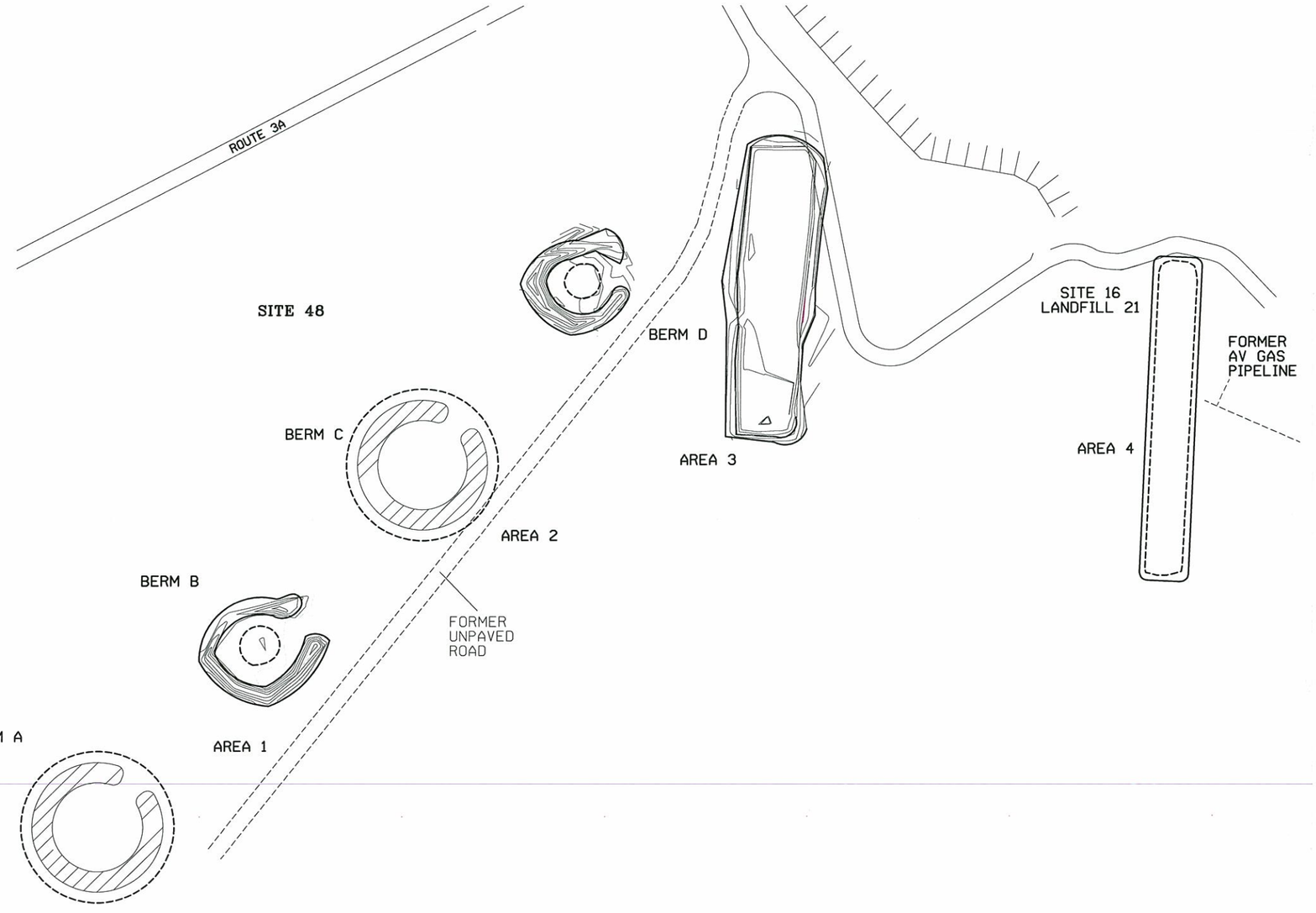
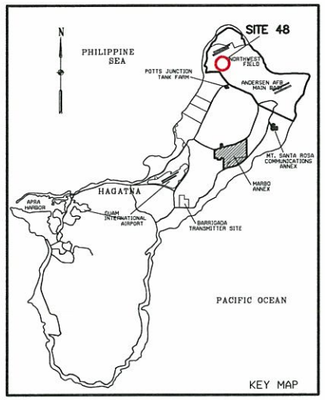


Figure 2–1.
Location Map of
Sites 48, 56, 58, 70, and 73 at
Northwest Field, Andersen AFB, Guam.





LEGEND:

TANK BERM

EARTHEN BERM APPROXIMATELY 3.5 FEET HIGH

TOPOGRAPHIC CONTOUR

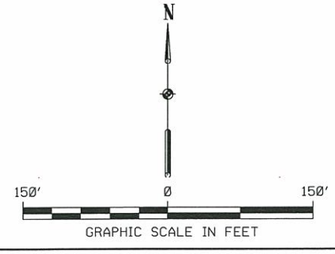
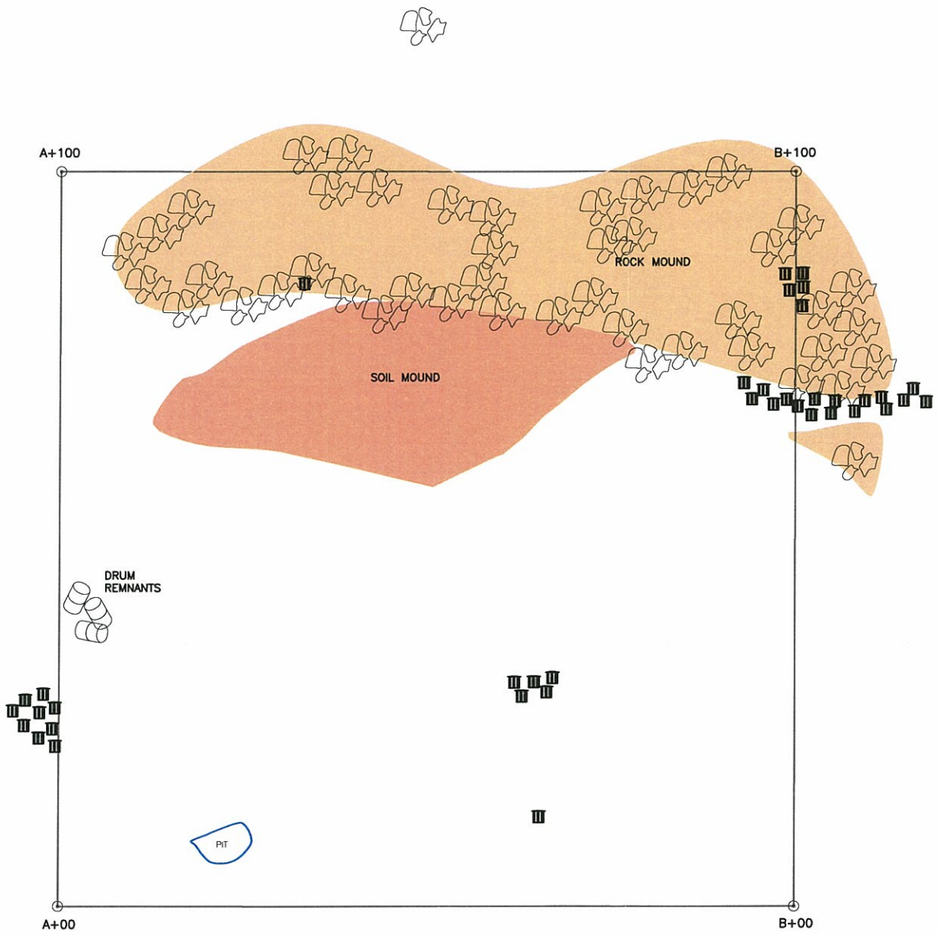
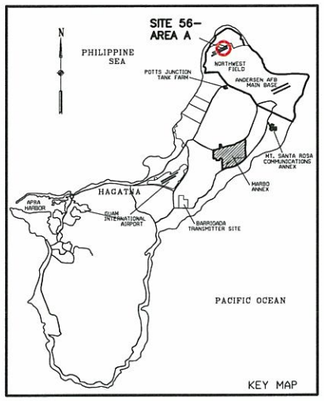


Figure 2-2.
Location Map of Site 48,
Northwest Field, Andersen AFB, Guam.





LEGEND:

- 55-GALLON DRUM REMNANTS
- PIT
- MISCELLANEOUS DEBRIS INCLUDES LARGE AND SMALL METAL CONTAINERS, SHEET METALS, WIRES, CABLES, AUTO PARTS, ENGINE PARTS, GLASS, BOTTLES, CONCRETE SLABS, FOOD CANS, SODA CANS, AND HOUSEHOLD TRASH
- MOUNDED AREA
- MOUNDED AREA WITH CORAL RUBBLE
- A+00 GEOPHYSICAL GRID (NAIL SET)

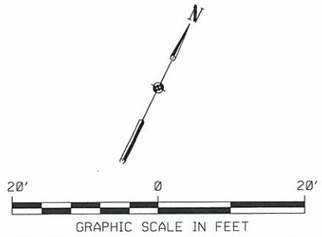
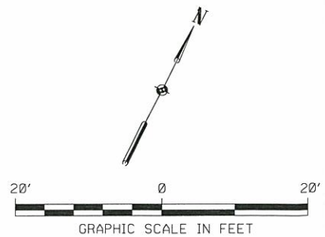
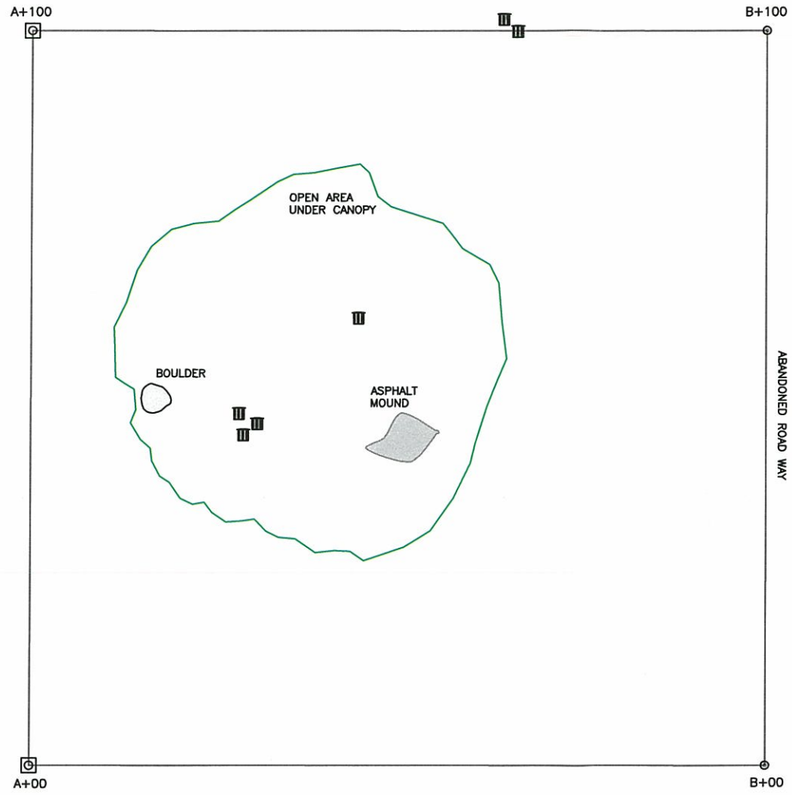
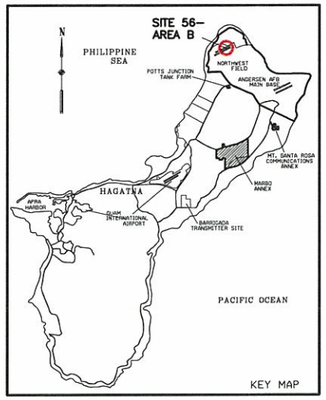


Figure 2-3.
Location Map of Site 56 Area A, Northwest Field, Andersen AFB, Guam.



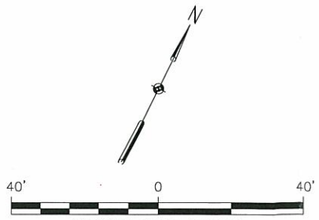


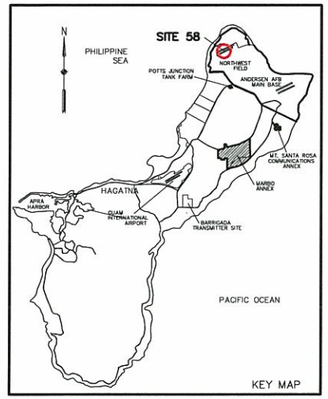


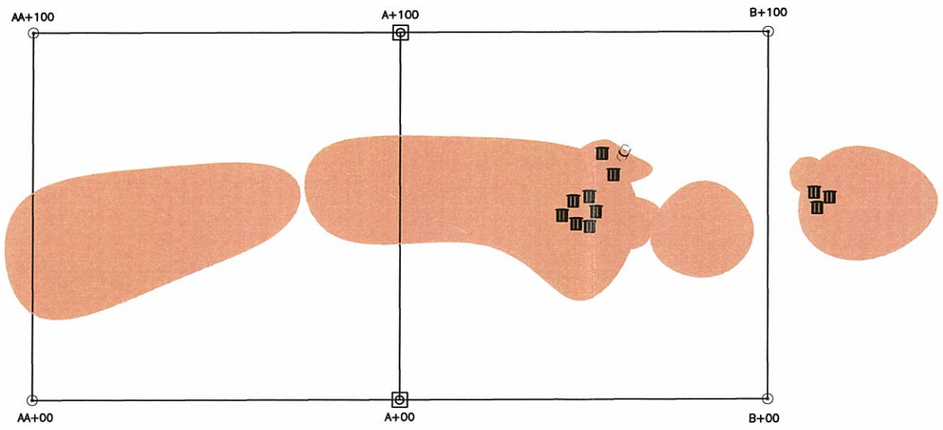
LEGEND:

- ASPHALT MOUND
- BOULDER
- MISCELLANEOUS DEBRIS INCLUDES LARGE AND SMALL METAL CONTAINERS, SHEET METALS, WIRES, CABLES, AUTO PARTS, ENGINE PARTS, GLASS, BOTTLES, CONCRETE SLABS, FOOD CANS, SODA CANS, AND HOUSEHOLD TRASH
- OPEN AREA UNDER CANOPY
- 4" X 4" CONCRETE MONUMENT
- ABANDONED ROAD WAY
- GEOPHYSICAL GRID (NAIL SET) B+00

Figure 2-4.
Location Map of Site 56 Area B, Northwest Field, Andersen AFB, Guam.



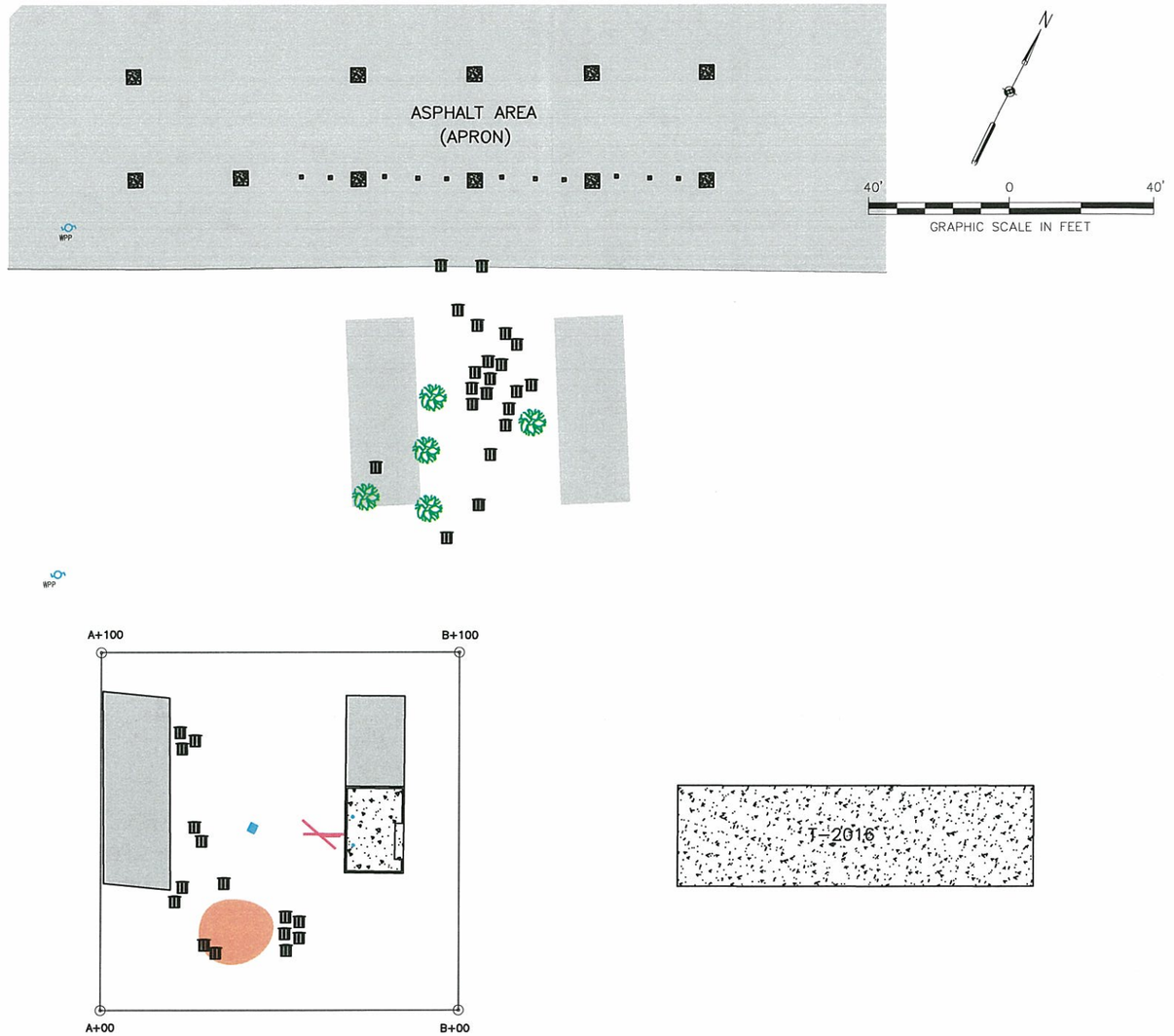


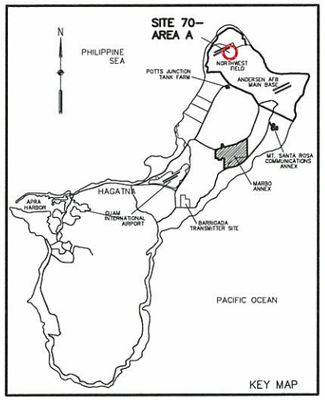


LEGEND:

- 55-GALLLON DRUM REMNANTS
- MISCELLANEOUS DEBRIS INCLUDES LARGE AND SMALL METAL CONTAINERS, SHEET METALS, WIRES, CABLES, AUTO PARTS, ENGINE PARTS, GLASS, BOTTLES, CONCRETE SLABS, FOOD CANS, SODA CANS, AND HOUSEHOLD TRASH
- MOUNDED AREA
- A+00 GEOPHYSICAL GRID (NAIL SET)
- 475 CONTOUR ELEVATION
- 4" X 4" CONCRETE MONUMENT

Figure 2-5.
Location Map of Site 58,
Northwest Field, Andersen AFB, Guam.

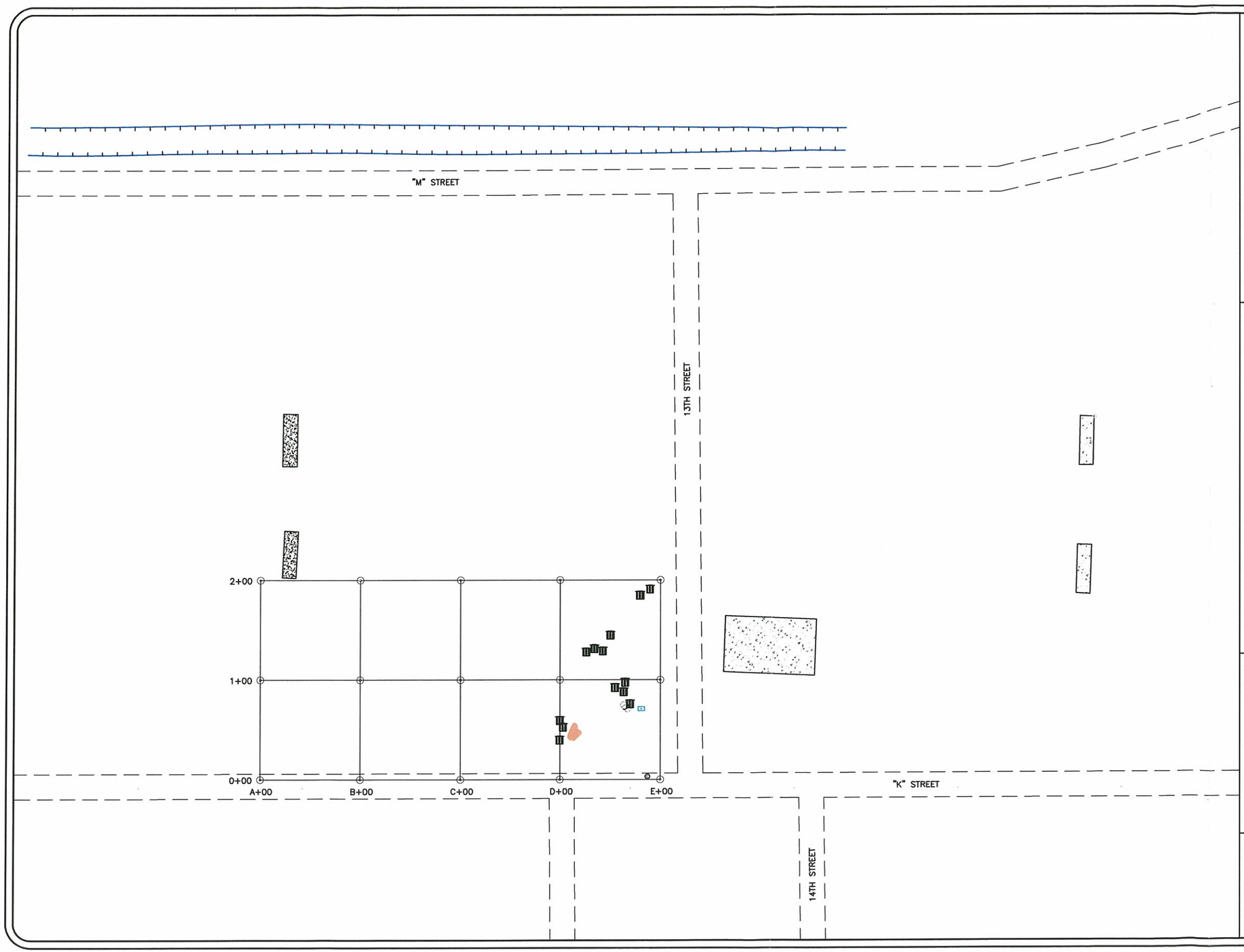


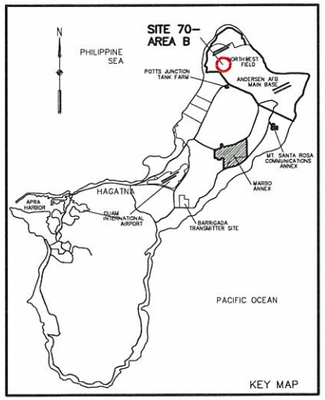


LEGEND:

- MISCELLANEOUS DEBRIS INCLUDES LARGE AND SMALL METAL CONTAINERS, SHEET METALS, WIRES, CABLES, AUTO PARTS, ENGINE PARTS, GLASS, BOTTLES, CONCRETE SLABS, FOOD CANS, SODA CANS, AND HOUSEHOLD TRASH
- CONCRETE PEDESTAL
- TREE
- WPP — WOODEN POWER POLE
- 8" DIA CANISTER PAIL
- RUSTED STEEL PIPE
- FLOOR DRAIN IN CONCRETE PAD
- BOULDER ROCK
- MOUNDED AREA WITH CORAL RUBBLE
- ASPHALT PAD
- CONCRETE PAD
- A+00 — GEOPHYSICAL GRID (NAIL SET)

Figure 2-6.
Location Map of Site 70 Area A,
Northwest Field, Andersen AFB, Guam.





LEGEND:

- DETERIORATED 55–GALLON DRUM OR SUSPECTED DRUM REMNANTS
- MISCELLANEOUS DEBRIS INCLUDES LARGE AND SMALL METAL CONTAINERS, SHEET METALS, WIRES, CABLES, AUTO PARTS, ENGINE PARTS, GLASS, BOTTLES, CONCRETE SLABS, FOOD CANS, SODA CANS, AND HOUSEHOLD TRASH
- 10 INCHES DIAMETER HOLE IN GROUND POSSIBLE SEPTIC TANK
- MOUNDED AREA
- CONCRETE PAD
- A+00 GEOPHYSICAL GRID (NAIL SET)
- TRENCH

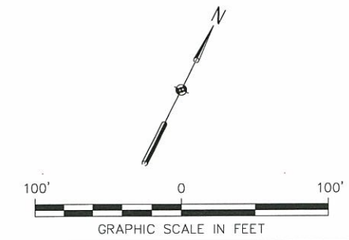
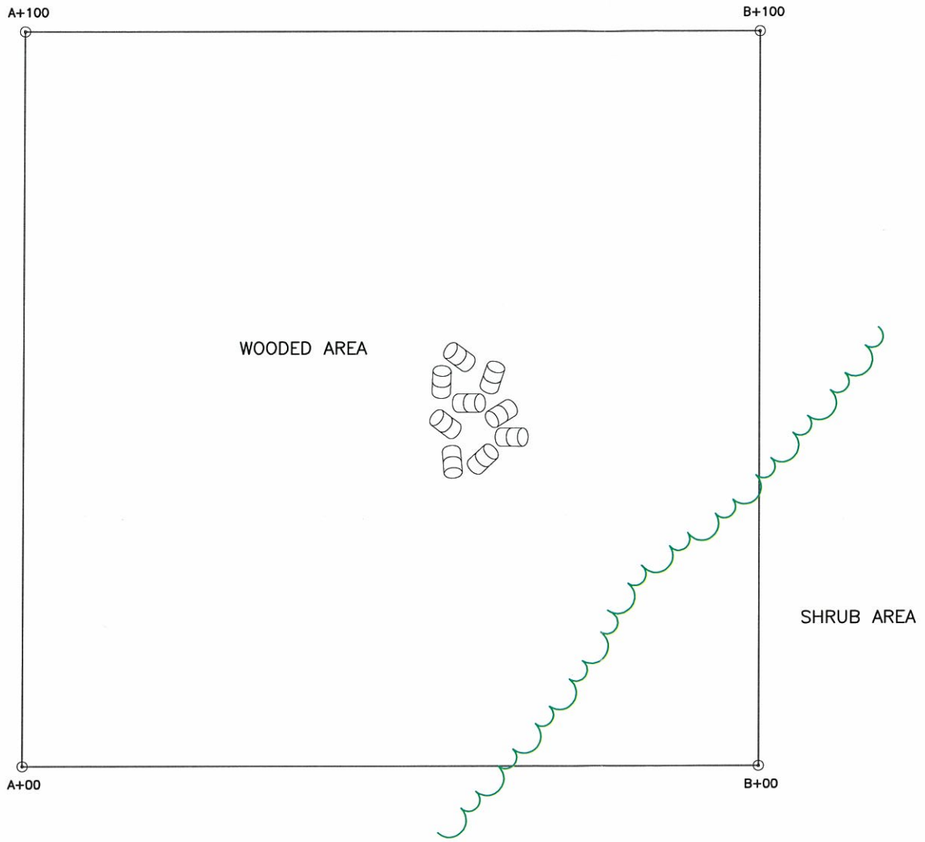
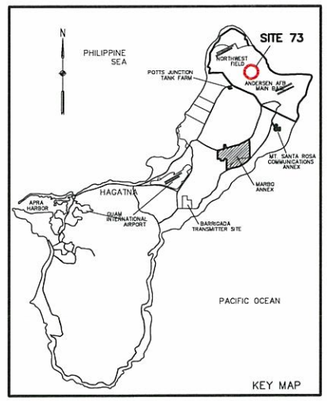


Figure 2–7.
Locations Map of Site 70 Area B,
Northwest Field, Andersen AFB, Guam.





LEGEND:

DETERIORATED 55–GALLON DRUM OR SUSPECTED DRUM REMNANTS

A+00 GEOPHYSICAL GRID (NAIL SET)

EDGE OF VEGETATION

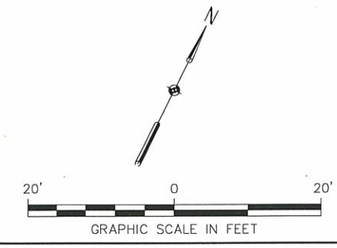


Figure 2–8.
Location Map of Site 73,
Northwest Field, Andersen AFB, Guam.

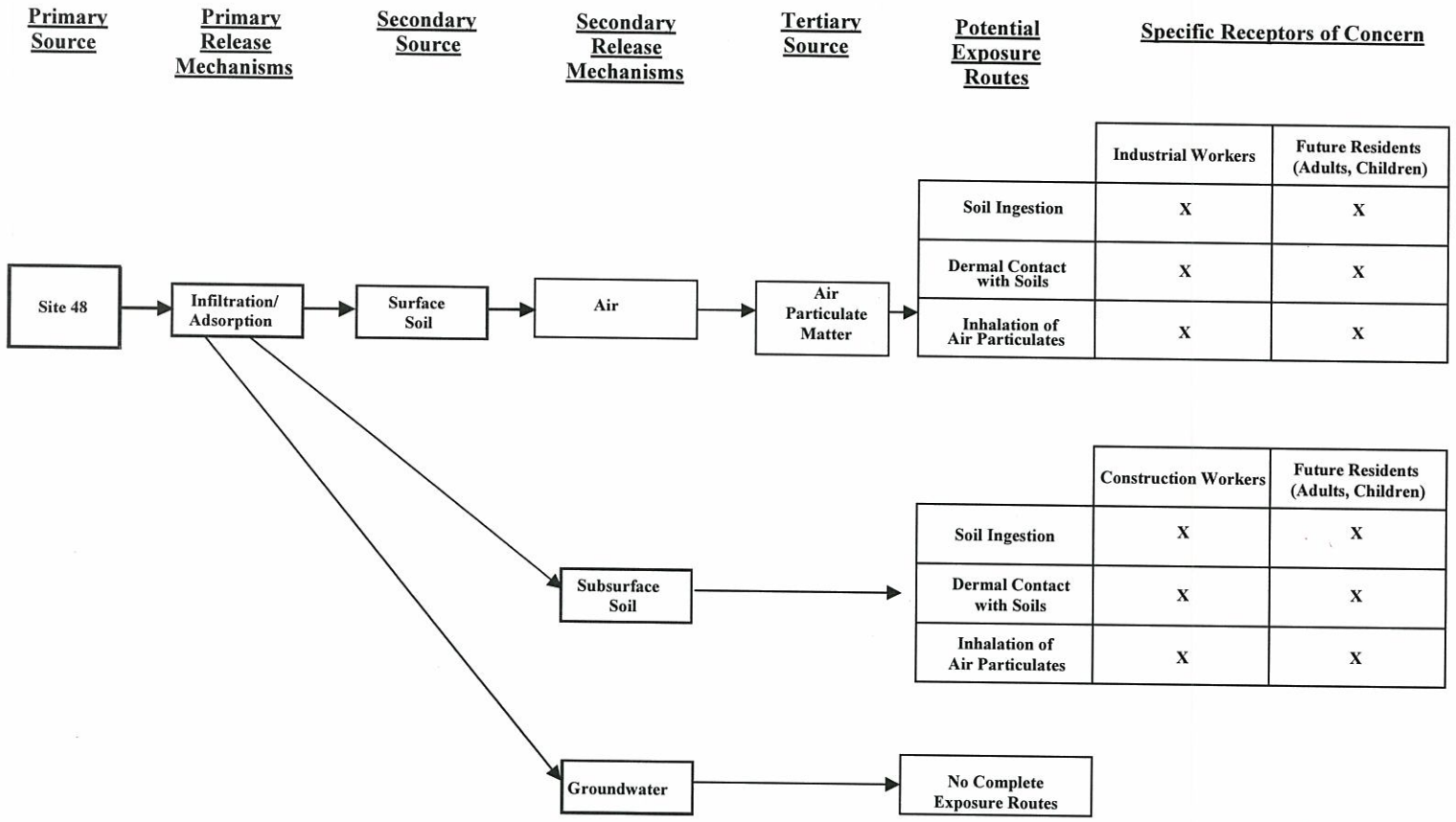


Figure 2-9. Human Health Conceptual Site Model for Site 48, Andersen AFB, Guam.

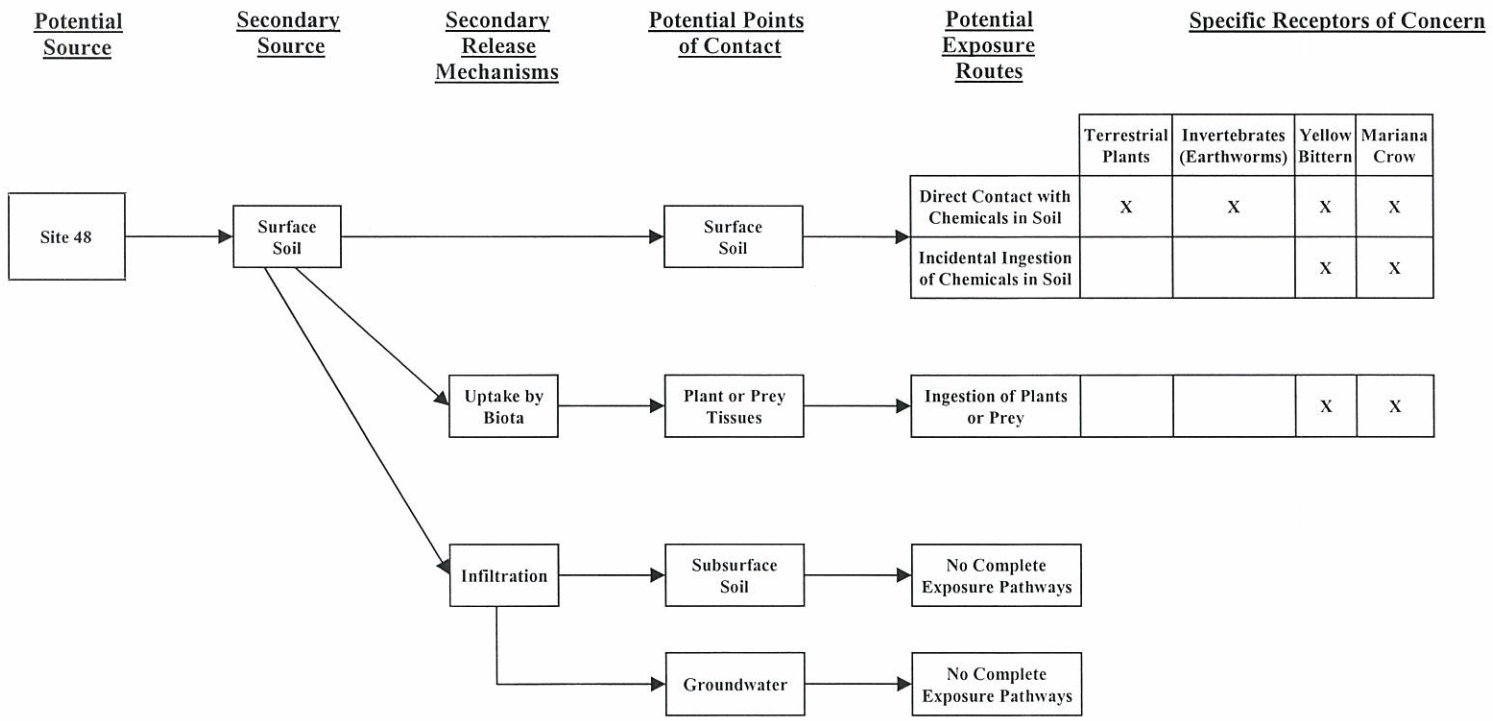


Figure 2-10. Ecological Risk Conceptual Site Model for Site 48, Andersen AFB, Guam.

3.0 Responsiveness Summary

This section provides a summary of the public comments regarding the Proposed Plan for remedial action at Sites 48, 56, 58, 70, and 73 at Andersen AFB, Yigo, Guam. At the time of the public review period, the USN had determined that no CERCLA remedial action is necessary at Sites 48, 56, 58, 70, and 73. Based upon the verbal comments received, the Proposed Plan was accepted by the public.

3.1 Stakeholder Comments and Lead Agency Responses

A public meeting was held on 14 August 2008, at the Guam Marriott Hotel in Tumon, Guam. The meeting officially began at 6:56 PM and concluded at 8:20 PM, according to the transcript. The meeting was attended by 14 members of the community which included seven members of the Andersen AFB Restoration Advisory Board. Mr. Gregg Ikehara, Andersen AFB 36 Civil Engineer Squadron/Civil Engineer Environmental Flight (36th CES/CEVR), provided an opening statement. Mr. Danny Agar (36th CES/CEVR Remedial Project Manager) gave a PowerPoint presentation discussing the proposed plan for four separate groups of IRP sites. Each presentation provided a brief site history, summary of past investigative studies and related analytical results, and when applicable a summary of the human health and ecological risk assessments. The preferred remedial alternative at each IRP site was also presented.

After the presentation, six members of the community spoke. The questions and comments were primarily for clarification or looking for additional information rather than questions or comments on the preferred remedial alternative. Most questions were answered at the meeting. A brief summary of individual questions and comments are included on the following pages. Questions and comments after the presentation covered all four proposed plans, however, only questions specific to aspects of IRP Sites included in this ROD are presented in the responsiveness summary below. The complete transcript is available in the AR file for Andersen AFB, which is available for public review at the Robert F. Kennedy Library at the University of Guam and the Nieves M. Flores Memorial Library in Hagåtña.

General

Mr. Gawel asked what the steps are following the deadline and receipt of comments, and what date would be posed for the Record of Decision. Mr. Ikehara stated that under the current process, mandated by CERCLA, comments are solicited for 30 days. The comments received are incorporated into the Records of Decision, which follows after the proposed plan stage. The Record of Decision is the legal decision document that dictates what the future situation or the future condition of that site will be. It takes approximately six months to generate a responsiveness summary, as well as the legal basis for the Record of Decision.

Mr. Quitugua asked, in reference to the no action alternative, if any action could be taken at the site, and if the decisions that are made in the Records of Decisions could change. Mr. Ikehara explained that if the preferred remedial alternative is no action, then nothing will be done. He explained that the decisions were not made by the Air Force alone. It is done in a tripartite agreement called the Federal Facility Agreement, which is basically a roadmap to the cleanup of all the identified CERCLA sites. If there is a change in the record of decision phase, it would

need to be worked extensively and discussed at the remedial project managers' level to determine what would be a better course of action other than no further response.

Mr. Kasperbauer asked how it was decided to investigate these particular sites and not some of the others. Mr. Ikehara explained that part of it is funding eligibility issues. The Air Force has determined that if certain sites have been used after 1984, the eligibility has been exceeded for use of our environmental restoration account money. That is the cutoff date that the Air Force has selected as a result of CERCLA, or actually in this particular case, it's a super fund amendment which was in 1984. The sites were identified as part of the records search and part of the preliminary assessment and site inspection that was done early on to determine which sites were really sites that required further evaluation, further sampling, and the extensive CERCLA steps that need to be followed to get to a cleanup action or determination that a cleanup is not required because there is no risk.

Mr. Jocson asked for clarification between these types of sites versus what qualifies as a FUDS site. Mr. Ikehara explained that the FUDS are the Formerly Used Defense Sites. It is a program that's run by the Corps of Engineers. The Air Force is not responsible for FUDS. They are responsible for sites within the Air Force footprint, and those are the sites that are being addressed under the restoration program.

Mr. Kasperbauer asked if the public can anticipate future military activity at these sites versus the sites that have not been investigated. Lt. Colonel Mathews explained that the Air Force looks at historical use and identifies the areas of concern that need to be cleaned up under CERCLA. Future use or plan was not an issue. The issue was to be a good steward and clean the areas up under the law. The Air Force looks at which areas have high risk potential that need to be cleaned up, and investigates those areas to see if there are contaminants out there, and if there are, they plan on cleaning it up. –For some of these areas there is no planned future use, it may just sit in its current state after it is cleaned up. Mr. Ikehara added that future land use is a consideration when investigating the sites. If the site is planned for residences, certain criteria have to be met. The most conservative use of the property would be future resident child. So it does play in to how we screen and how we determine the appropriate level of cleanup at these sites.

Site 48

Mr. Kasperbauer asked if the fuel stored in the tanks was brought in from the tanks at Potts Junction and whether or not the pipeline from Potts Junction was removed and, if so, when and whether or not any investigation was done regarding the pipeline. Mr. Agar indicated that the investigation involved the tanks themselves and that the pipelines were removed prior to investigating the site. *Ms. Brown requests that the Air Force look into the history of the pipelines.*

Site 56

No specific comments received for this site.

Site 58

No specific comments received for this site.

Site 70

Ms. Brown asked about the metallic waste and other debris that was found at Site 70, if it will be left at the site or cleaned up. Mr. Agar explained that the Air Force does not address solid wastes, if there are solid wastes, unless there is a source of contaminants at the site.

Site 73

No specific comments received for this site.

3.2 Technical and Legal Issues

No technical or legal issues were identified during the public review period of the Proposed Plan.

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4.0 References

Barrett, Harris, & Associates, 1982. *Summary Report, Northern Guam Lens Study.* December.

Binder S, Sokal D, Maughan D., 1986. *Estimating soil ingestion: the use of tracer elements in estimating the amount of soil ingested by young children.* Archives of Environmental Health; 41: 341-345.

Calabrese, E., Barnes, R., Stanek, E. J., Pastides, H., Gilbert, C., Veneman, P., Wang, X., Lasztity, A., Kostecki, P., 1989. *How much soil do young children ingest: an epidemiologic study.* Petroleum Contaminated Soils. pp. 363-397.

Clausing, P., Brunekreef, B., van Wijnen. J.H., 1987. *A method for estimating soil ingestion by children.* International Archives of Occupational and Environmental Health; 59:73–82.

Davis, S., Waller, P., Buschbom, R., Ballou, J., White, P., 1990. *Quantitative estimates of soil ingestion in normal children between the ages of 2 and 7 years: population-based estimates using aluminum, silicon, and Titanium as Soil Tracer Elements.* Archives of Environmental Health 45(2):112–122.

EA Engineering, Science, and Technology, Inc. (EA), 1998a. *Final Phase II Environmental Baseline Survey for Northwest Field, Andersen AFB, Guam.* October.

EA, 1998b. *Groundwater Summary Report, Andersen Air Force Base, Guam.* August.

EA, 1999. Memorandum: Discontinuation of Groundwater Monitoring of 10 Wells in Northwest Field, Andersen AFB, Guam. June.

EA, 2007a. *Final Remedial Investigation/Feasibility Study for Sites 47, 48, 49, 50, 51, 52, 53, and 55, Site-wide Operable Unit, Andersen Air Force Base, Guam.* July.

EA, 2007b. *Preliminary Assessment/Site Inspection for Ten IRP Sites at Northwest Field, Andersen Air Force Base, Guam.* August.

EA, 2007c. *Final No Further Response Action Planned (NFRAP) Decision Document for Sites 56, 58, 70, and 73, Northwest Field, Andersen Air Force Base, Guam.* September.

EA, 2007d. *Final Fall 2006 Groundwater Monitoring Report for Andersen Air Force Base, Guam.* February.

ICF Technology, Inc. (ICF), 1995. *Phase I-Environmental Baseline Survey Report, The Northwest Field, Andersen Air Force Base, Guam Mariana Islands.* Department of the Air Force, 36 Air Base Wing, Civil Engineering Squadron. December.

ICF, 1996a. *Expanded Source Investigation/Visual Site Inspection Report, Andersen Air Force Base, Guam.* February.

ICF, 1996b. *Installation Restoration Program, Final Records Search for Andersen Air Force Base, Guam.* February.

United States Air Force (USAF), 1999. Minutes from May 1999 RPM Meeting, Honolulu, HI. May.

USAF, 2001. Minutes from February 2001 RPM Meeting, Andersen AFB, Guam. February.

USAF, 2006. *Final Environmental Assessment, Beddown of Training and Support Initiatives at Northwest Field, Andersen Air Force Base, Guam.* June.

USEPA (U.S. Environmental Protection Agency), 1989. *Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A) (Interim Final).* EPA/540/1-89002. EPA Office of Emergency and Remedial Response, Washington, D.C.

USEPA, 1994. *Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children.* EPA/540/R-93/081(NTIS No. PB93-963510). Office of Solid Waste and Emergency Response. Washington, D.C. February.

USEPA, 1996. *Exposure Factors Handbook, Volumes I, II, and III.* Report No. EPA/600/P-95/002Ba,b,c. Exposure Assessment Group, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. August.

United States Environmental Protection Agency (USEPA), Guam Environmental Protection Agency (Guam EPA), and the United States Air Force (USAF), 1993. *Federal Facility Agreement Under CERCLA Section 120.*

Ward, P.E., S.H. Hoffman, and D.A. Davis, 1965. *Hydrology of Guam.* U.S. Geological Survey Professional Paper 403H. 28 p.

Young, F.J., 1988. *1988 Soil Survey of Territory of Guam.* United States Department of Agriculture, Soil Conservation Service, in Cooperation with Guam Department of Commerce and University of Guam. May.

APPENDIX A

NOTICE OF PUBLIC MEETING

ANDERSEN AFB
INSTALLATION RESTORATION PROGRAM
PUBLIC MEETING

A public meeting to present the Final Proposed Plan for Remedial Alternatives at Installation Restoration Sites 44, 45, 46, 47, 48, 49, 50, 51, 53, 55-A, 56, 58, 59, 61, 67, 68, 69, 70, and 73 will be held on Thursday, August 14, 2008 at 6:30 p.m. at the Guam Marriott Resort & Spa, Lobby Level, The View, Tumon Guam.

Documents are available for public viewing at Nieves M. Flores Memorial Library, Hagatna, Guam and Robert F. Kennedy Memorial Library, Mangilao, Guam.

For questions regarding the Proposed Plans, please call the Remedial Project Manager, Mr. Gregg Ikehara at 366-4692.

NOTICE OF AVAILABILITY

Andersen Air Force Base Installation Restoration Program has prepared four Proposed Plans for Remedial Alternatives for Sites within the Site Wide Operable Unit. The Sites addressed in the four Proposed Plans are presented in the following groups:

1) **Sites 47, 50, 51, 53, and 55-A** - ***Remedial Action is Required***
2) **Sites 45, 49, 59, 61, 67, 68, and 69** - ***No Action is Required***
3) **Sites 48, 56, 58, 70, and 73** - ***No Action is Required***
4) **Sites 44 and 46** - ***No Action is Required***

The Proposed Plans describe the remedies considered for these Sites and evaluate the potential risks posed to human and ecological receptors, and establish a risk-based cleanup standard. The preferred remedies presented in the plans include remedial action (soil removal) and no action. Additional remedies considered in the evaluation process included institutional controls. The final remedy will be selected after public comments are received.

The Proposed Plans are available for public review at the Nieves M. Flores and Robert F. Kennedy Memorial Libraries. The 30-day public comment period for the Proposed Plans will end 31 August 2008. Comments can be mailed to 36 CES/CEVR Unit 14007, APO AP 96543-4007 and must be postmarked on or before 31 August 2008.

For questions regarding the Proposed Plans, please call the Remedial Project Manager, Mr. Gregg Ikehara at 366-4692.

APPENDIX B

FEDERAL FACILITY AGREEMENT

CHANGE LETTERS

DEPARTMENT OF THE NAVY
COMMANDER, JOINT REGION MARIANAS
PSC 455, BOX 152
FPO AP 96540-1000

IN REPLY REFER TO:
9510
Ser J4/1235
November 23, 2009

Mr. Mark Ripperda
US Environmental Protection Agency
75 Hawthorne St. H-9-4
San Francisco, CA 94105-3901

Dear Mr. Ripperda,

SUBJECT: NOTIFICATION OF TRANSFER OF ENVIRONMENTAL RESTORATION PROGRAM RESPONSIBILITY

This letter serves as notification that all Environmental Restoration Program responsibilities for Andersen Air Force Base (AAFB), a property listed on the National Priorities List, will be officially transferred to the United States Navy under the Commander, Joint Region Marianas (CJRM), effective October 1, 2009, pursuant to chapter 2.17 of the April 2008 Department of Defense Environmental Supplemental Guidance (EVSG) for Implementing and Operating a Joint Base. This action is being taken to implement the 2005 Defense Base Realignment and Closure (BRAC) Act which requires the transfer of all installation support functions and administrative custody of real property from AAFB to the U.S. Navy.

In accordance with the EVSG, the Navy, as the supporting component, "will assume responsibility for environmental restoration data reporting, budgeting, record keeping, and financial liability" (Ch. 2.17.6), "will assume responsibility for all Restoration Advisory Boards" (Ch. 2.17.8), and will be required to "honor all existing, previously negotiated Federal Facility Agreements in place at the installations to become the Joint Base [Region] at the time of transfer." (Ch. 2.17.5).

If you have any questions, please contact Mr. Richard Raines, P.E., at telephone (671) 339-8420 or at richard.raines@fe.navy.mil.

Sincerely,

P. S. LYNCH
Captain, CEC, U.S. NAVY
Regional Engineer
By direction of the Commander

Copy to:
Guam Environmental Protection Agency
CNIC (N45)
NAVFAC Pacific (EV)
36CES

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 36TH WING (PACAF)
UNIT 14007, APO AP 96543-4007

06 November 2009

36 CES/CEVR
Unit 14007
APO AP 96543-4007

Mr. Mark Ripperda
Project Manager
U.S. Environmental Protection Agency
75 Hawthorne St., H-9-4
San Francisco, CA 94105-3901

Dear Mr. Ripperda

This letter provides notice of a change in administrative responsibility pursuant to paragraph 28 of Federal Facility Agreement (FFA) Docket Number 93-117 (FFA).

As you are aware, Andersen Air Force Base is in the process of realigning installation management functions to a newly established Joint Region Marianas pursuant to the 2005 Defense Base Closure and Realignment Commission Final and Approved Recommendations. Title to Andersen Air Force Base real property will remain in the United States and the property will continue to be utilized by the Air Force. As of October 1, 2009, however, administrative custody and responsibility for managing real property assets will transfer from the Air Force to the Navy. The Air Force will become a supported component of the Joint Region Marianas and the Navy will become the supporting component.

In accordance with the April 2008 Department of Defense Environmental Supplemental Guidance for Implementing and Operating a Joint Base, the Navy, as the supporting component, *"will be responsible for all existing and future environmental permits, requirements, plans, and agreements at the installations to become the Joint Base."* (Ch. 1.1.2). As the supporting component, the Navy will be required to *"honor all existing, previously negotiated Federal Facility Agreements in place at the installations to become the Joint Base at the time of transfer."* (Ch. 2.17.5). The Navy is being supplied with an Environmental Condition of Property Report and with access to current environmental files including the FFA. No change to the FFA will be necessary in order for the Navy to assume responsibility for implementation of the FFA and the transfer of responsibility will not change the rights of the parties under the FFA or impede any action under the FFA. The Environmental staff will remain located at Andersen Air Force Base following 01 October 2009 and will be available to assist with any issues related to the FFA. However, the civilian environmental staff will become Navy employees and, likewise, funding responsibility will reside with the Navy.

Please contact Mr. Russell Littlejohn, Environmental Flight Chief, at (671) 366-2556 if you have any questions or concerns or would like to discuss possible changes/addendums to the FFA to further document the substitution of the United States Navy for the United States Air Force as the entity responsible for implementation of the FFA.

Sincerely

GREGG IKEHARA
Chief, Installation Restoration Program

cc:
Ms. Lorilee Crisostomo, GEPA
Mr. Rich Howard, Tech Law Inc.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 36TH WING (PACAF)
UNIT 14007, APO AP 96543-4007

06 November 2009

36 CES/CEVR
Unit 14007
APO AP 96543-4007

Ms. Lorilee Crisostomo
Project Manager
Guam Environmental Protection Agency
P.O. Box 22439 GMF
Barrigada, Guam 96921

Dear Ms. Crisostomo

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Sincerely

GREGG IKEHARA
Chief, Installation Restoration Program

cc:
Mr. Mark Ripperda, USEPA
Mr. Rich Howard, Tech Law Inc.