Bangor Naval Submarine Base
Silverdale, Washington

Engineering Field Division/Activity:	EFANW
Major Claimant:	CINCPACFLT
Size:	6,692 Acres
Funding to Date:	$49,736,000
Estimated Funding to Complete:	$50,898,000
Base Mission:	Provides support base for Trident submarines
Contaminants:	Otto fuel, picricacid, RDX, TNT

Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	38	**High:**	14	**Not Evaluated:**	1
RCRA Corrective Action:	0	**Medium:**	0	**Response Complete:**	25
RCRA UST:	2	**Low:**	0	**Total Sites:**	40
Total Sites:	40				

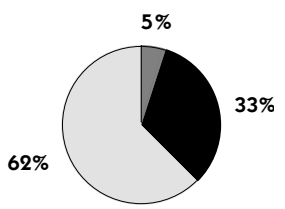
NPL

EXECUTIVE SUMMARY

Bangor Naval Submarine Base (NSB) is located on Hood Canal, which is ten miles north of Bremerton, Washington. Prior to its commissioning as a submarine base in 1977, the Navy facility at Bangor was primarily a transshipment and storage point for ordnance. Ordnance arrived by train and was shipped by boat to support the US military efforts in the Pacific Ocean during World War II and the Korean and Vietnam Wars.

As a storage facility, out-of-date and surplus ordnance was dismantled and steam cleaned, burned, or detonated on the base. The water from the steam cleaning demil operation, Site 204 (former Site F), drained into an unlined lagoon into the water table aquifer. The wastewater contained the ordnance compounds cyclonite (RDX) and trinitrotoluene (TNT) which washed through the ground and into the shallow aquifer. Over the years the RDX migrated with the flow of the groundwater. RDX is currently being detected approximately 3,000 feet northwest of the lagoon area. During this time, industrial wastes from supporting activities were also disposed of on base. These were common disposal practices from the 1940's through the early 1970's. Contaminants found include otto fuel residues, electroplating wastes, ammonium picrate, the ordnance compound DNT, the gasoline component benzene, the organic solvent DCA, the chemical additive PCB, pesticides and herbicides. The Navy has changed its operational processes to prevent further contamination. The Bangor Ordnance Disposal Area was placed on the National Priorities List (NPL) in 1987 due to concerns about ordnance-contaminated soil and groundwater, and the remainder of the base was placed on the NPL in 1990. On 29 January 1990, a Federal Facility Agreement (FFA) was signed by the Navy, EPA, and the State of Washington. Sites were grouped into eight Operable Units (OUs) for the Remedial Investigation and Feasibility Study (RI/FS) phase.

Drainage from Bangor NSB empties into Hood Canal and Dyes Inlet. Trident Lake is located south of Site 2 which has a high relative risk ranking. There are a series of aquifers underlying the submarine base. Contaminants have been found in a seasonal aquifer and the water table aquifer. The base receives its water from a deeper aquifer layer; the sea level aquifer. No contaminants have been detected in the deeper aquifer. Residents living around the base obtain their drinking water from nearby wells.



Current Status Of Sites

Studies Underway	2
Cleanups Underway	13
Response Complete	25
TOTALS	40

Community relations for NSB Bangor is an ongoing effort. The Community Relations Plan (CRP) was finalized in FY93. A local citizen's group obtained a grant from EPA and funds from the State of Washington Department of Ecology to oversee operations at NSB Bangor. A Restoration Advisory Board (RAB) was formed in FY95 and is expected to begin meeting in December 1995.

At the end of FY95, only two of the 40 sites at Bangor NSB were still in the study phase, 13 were in the cleanup phase and 25 were Response Complete (RC). Early removal actions include Underground Storage Tank (UST) removals in FY92 and FY94. Cleanup actions will continue for USTs 1 and 4 in FY96. The final removal action for UST 4 should begin in FY97.

In FY93, the excavation and disposal of buried drums was completed at OU 7 and a bermed area was reconstructed. A Record of Decision (ROD) is expected to be completed in FY96 for OU 7 and a Remedial Action (RA) for soils will also be completed. RA for groundwater will begin in FY97.

The Navy performed a precautionary measure in FY95 at OU 8 to protect human health. Volatile organic compounds (VOCs) above acceptable levels for drinking water were detected in a newly drilled community well. The well was never used by residents or certified by use by the health district. The Navy and health officials sampled nearby monitoring and residential wells. Since the compounds were only detected in the newly drilled well, the Navy drilled additional monitoring wells, found more VOC contamination, and then connected nearby residents to a public water supply. The Navy has drilled 24 additional monitoring wells to identify the extent of the compounds in the aquifer. Based on the information, the Navy will install a groundwater treatment system to contain the flow of chemicals from the base. Pump and Treat containment is on the fast-track and began in February of 1995. An enhanced system that uses an air-stripper within the treatment train to clean up the aquifer is expected to be operational in June of 1996.

An RA for soils will begin in December 1995 at OUs 2 and 6 using composting to degrade ordnance compounds (primarily TNT). An RA is expected to be completed in FY97. The estimated cost to compost the soils at both sites is less than half the cost of incineration. The treatment time is expected to be eight months for 1600 cubic yards of soil. Groundwater treatment design for OU 2 is expected to be completed in FY96.

BANGOR NSB
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - Drainage from Bangor NSB empties into Hood Canal and Dyes Inlet. Trident Lake is located south of Site 2 which has a high relative risk ranking. There are a series of aquifer beneath the submarine base. Contaminants have been found in a seasonal aquifer and the water table aquifer. The submarine base receives its water from a deeper aquifer layer; the sea level aquifer. No contaminants have been detected in the deeper aquifer.

One of the sites, Site 204 (Site F) is a former unlined lagoon that received wastewater from ordnance dismantling operations during the 1960's and 1970's. The wastewater also migrates into an overflow channel. Ordnance compounds were detected in the water table aquifer at Site 204. Off-base residents may receive water from this aquifer.

Residents living around the base obtain their drinking water from nearby wells. The Navy performed a response action in FY95 to connect a neighborhood near Bangor NSB with public drinking water. This is a precautionary measure to protect human health. Volatile organic compounds (VOCs) above drinking water levels were detected in a newly drilled community well. The well was never used by residents or certified by use by the health district. The Navy and health officials sampled nearby monitoring and residential wells. Since the compounds were only detected in the newly drilled well, the Navy drilled additional monitoring wells, found more VOC contamination, and hence connected nearby residents to a public water supply. The Navy has drilled 24 additional monitoring wells to identify the extent of the compounds in the aquifer. Based on the information, the Navy will install a groundwater treatment system to contain the flow of chemicals from the base. Pump and treat containment is on the fast-track and began in February of 1995. An enhanced system that uses an air-stripper in the treatment train to clean up the aquifer is expected to be operational in June of 1996.

NATURAL RESOURCES - NSB is in the second stage of reforestation. Most of the base is covered with Douglas Fir. Many other tree species are also present, such as western red cedar, grand fir, and western hemlock. There are chaparral areas and wetlands on the base. There are two boggy areas (swamps) at the northern boundary of Camp Wesley Harris, and another near the center of the property on the eastern boundary. Some areas on NSB support an abundance of species and are ecologically significant. Wilkes Marsh provides nesting areas for waterfowl. Duck hunting is allowed at NSB during a prescribed season. The marine waters along the NSB shoreline contain an abundant marine fauna including shellfish, salmon and herring. The warbled marrelot is the only endangered species at NSB Bangor.

RISK - Using the Department of Defense (DOD) Relative Risk Ranking System, fourteen sites received a high relative risk ranking at Bangor NSB. Site 2 which is contaminated with paint sludge, waste oil, and drums is very close to Trident Lakes, a recreational area. Site 201 is a 5-acre natural shoreline on Hood Canal which was used for dumping of solid and liquid wastes and landfilling. Groundwater and soil in this recreational area is contaminated. Sites 2 and 201 are part of OU 7. Remedial Design (RD) was completed for OU 7 in FY95. Cleanup proposed for soils is metal reclamation and Remedial Action (RA) will be completed in FY96. Site 28 was a former paint shop where paints and solvents were discharged into a waste ditch. Groundwater and private wells have been affected by these contaminants. A non-time critical removal action to stop VOC contamination migration from leaving the base will be implemented in FY96. A pump and treatment system will utilize an air stripper with a treatment train. Soils contaminated with lead can be found at Site 100, a pistol and handgun range.

Site 200 is a former explosive ordnance detonation and disposal area actively used from 1962-1975. Groundwater in this area is migrating towards an off-base residential area. Soil samples indicated the presence of TNT and dinitrotoluene (DNT) at levels that may be harmful to human health. The Navy has finished construction on a passive-soil washing system at this site and full operations began in FY95. Cleanup is anticipated to take five years. The Navy selected Granular Activated Carbon (GAC) to remove organic chemicals from the water. Using GAC will save costs as opposed to the original method selected, which was ultraviolet light and oxidizers (UV/OX). The GAC acts as a water filter. Once the carbon becomes full, it is pumped into a rotary kiln where the contaminants are destroyed by the heat. The carbon is then reusable. The Navy originally planned to excavate soil from this hillside and perform the soil washing. During the cleanup design, it became clear that removing steep hillside soil would endanger a sensitive wetland area below the site. Excavation of the hillside posed a greater risk to the ecosystem than leaving the soil in place. Thorn bushes were planted and signs prohibit access to the site. RA for soils is expected to be completed in FY97. Composting will be used to degrade the ordnance compounds TNT from the soils at Site 200.

Site 202 is a former ordnance burning ground. Surface water, soil, and a shallow aquifer are contaminated. The RD phase for soil composting at Site 202 will be completed in FY96. An RA will be completed in FY97.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - In 1987, Site 200 (former Site A) was placed on the National Priorities List (NPL) with a Hazard Ranking System (HRS) score of 30.42. On 30 August 1990, the rest of the base was listed on the NPL with a HRS score of 55.91 using information from the Initial Assessment Study (IAS). On 29 January 1990, the Department of the Navy (DON), EPA Region X, and the Washington State Department of Ecology signed a Federal Facility Agreement (FFA) for NSB Bangor. The EPA did not have sufficient information to delist any sites and requested additional studies at 22 sites. The FFA designated Sites B, 2, 4, 7, 10 and 18 for reentry into the Installation Restoration Program (IRP) process, added Site 26, identified Sites 27-30, and split Site C into Site 205 (East) and Site 206 (West). The FFA grouped the sites into the Operable Units (OUs) below. These OUs have been adjusted since the FFA was signed.
OU 1 - Site 200 (Site A)
OU 2 - Site 204 (Site F)
OU 3 - Sites 16, 24 and 25
OU 4 - Sites 205 (C-East) and Site 206 (C-West)
OU 5 - Site 5
OU 6 - Site 202 (Site D)
OU 7 - Sites 201 (Site B), Site 203 (Site E), 2, 4, 7, 10, 11, 18, 26 and 30
OU 8 - Sites 27-29

PARTNERING - Partnering sessions with the regulatory agencies expedited the cleanup of contaminated areas in FY94. The meetings streamlined the decision-making process by reducing the number of deliverables. Issues were resolved in person rather than through formal review comments, responses, and revisions.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - The Technical Review Committee (TRC) was formed in FY87 and met on a regular basis. The TRC was converted to a Restoration Advisory Board (RAB) in FY95 and is expected to actively begin meeting in December 1995.

COMMUNITY RELATIONS PLAN - The Community Relations Plan (CRP) was finalized in 1993.

INFORMATION REPOSITORY - Information Repositories were established in 1990 and are located at NSB Bangor Branch Library in Silverdale, Washington and the Central Kitsap Library in Bremerton, Washington. A copy of the Administrative Record (the official file) is contained in the Information Repositories.

BANGOR NSB
HISTORICAL PROGRESS

FY83

An Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA) was completed and identified 37 potentially contaminated sites: 29 sites at NSB Bangor and eight sites at Jackson Park Housing. Jackson Park Housing has been transferred to Naval Shipyard (NSY) Puget Sound.
Sites A, C-F, 5, 6, 11, 12 and 19 - These sites were recommended for further investigation due to suspected contamination of groundwater and soil.
Sites B, 1-4, 7-10, 13-18 and 20-23 - These sites were recommended for No Further Action (NFA) due to a lack of significant contamination or to the natural degradation of contaminants.
UST 4 - Consisted of eight tanks at the Public Works Industrial Area. Three tanks were removed prior to FY83. Two tanks were abandoned in place.

FY88

Sites 24 and 25 - These two sites were identified and recommended for a Site Inspection (SI).
Site A - This site was proposed for listing on the National Priorities List (NPL) due to concerns about ordnance-contaminated soil and groundwater. A Current Situation Report (equivalent to an SI) found that surface soil was contaminated with the ordnance compound TNT, burn mounds were contaminated with the ordnance compound RDX, and groundwater samples contained TNT and RDX.
Sites A, C-F, 5, 6, 11 and 12 - These sites were recommended for an SI.

FY89

Sites C-F, 5, 6, 12, 24 and 25 - A Current Situation Report (equivalent to an SI) found otto fuel present at Site C, the ordnance compounds TNT and RDX present in the soil and shallow groundwater at Sites D and F, low levels of heavy metals (copper, silver and mercury) but no significant concentrations of waste constituents at Site E, fluorescein and cadmium present at Site 6, low contaminant concentrations in surface water and soil at Site 12, ordnance and metals contamination found in soil at Site 24, and elevated levels of copper, lead, RDX and picramic acid at Site 25. All sites except Site E were recommended to continue to the Remedial Investigation/Feasibility Study (RI/FS) phase.
Site 6 - Nonhazardous waste was removed using station funds.
UST 2 - This site consisted of 16 abandoned tanks that were discovered under the Installation Restoration Program (IRP). A PA was completed.

FY91

OU 1 - An RI/FS was completed.
OU 2 - An Interim Record of Decision (ROD) was signed in September 1991 to contain the contaminants migrating into groundwater.

FY92

OU 1 - A ROD was signed for groundwater.
UST 1 - An inlet pipe leak was repaired.
UST 2 - Tanks were removed.
UST 3 - Two tanks at the Keyport/Bangor Docks, were removed.
Site 16 and OU 7 - A Site Characterization Report (equivalent to an SI) was completed. Further study was recommended for Operable Unit (OU) 7.

FY93

OU 1 - The passive soil washing design was completed.
OU 2 - The RI/FS phase was completed.
OU 3 - The RI/FS phase was completed. A ROD was completed with "limited action" for groundwater monitoring at Site 25 and a Remedial Action (RA) consisting of land deed restrictions at Sites 16 and 24.
OU 4 - An RI/FS was completed. A Revision to the Final RI/FS changed the "limited action" preferred alternative to "no-action" and the ROD was signed.
OU 5 - An RI/FS was completed. A no-action ROD was completed.
OU 7 - A removal action was completed that involved the excavation and disposal of buried drums at three sites and the reconstruction of a bermed area at Site 2.

FY94

OU 1 - Changes were made to the FY92 ROD for groundwater. Granular Activated Carbon (GAC) has replaced passive soil washing as the treatment selected. There will be no excavation of soil on steep embankments as originally planned.
OU 2 - Changes were made to the FY91 ROD for groundwater. The treatment technology selected was GAC.
OU 6 - An RI/FS was completed at OU 6. The ROD was completed for OU 6 and the contaminated soil will be remediated using composting.
OU 7 - A ROD was signed in March. Cleanup proposed for soils is an infiltration barrier by asphalt/vegetated soils.
UST 2 - This site consisted of eight tanks and their tank lines. Six operational tanks were determined to have leaked and two tanks were removed.

PROGRESS DURING FISCAL YEAR 1995

FY95

OU 2 - An Interim Remedial Action (IRA) began in October 1994.
OU 7 - The RI/FS was completed in October 1994. The Remedial Design (RD) was completed. Cleanup proposed for soils at OU 7 is metal reclamation.
OU 8 (Sites 22-29) - This OU was created when volatile organic compounds were found in the water table aquifer. The remedy included providing residential connections to the Silverdale Water District line. Pump and treat containment of groundwater containing possible volatile organic compounds is on the fast-track to avoid contamination of nearby residential wells. This action began in February.

PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Formal Restoration Advisory Board (RAB) meetings were started.
Sites 10 and 26 of OU 7 - Initiate Long Term Monitoring (LTM).
Sites 4, 7 and 30 of OU 7 - No action to be documented in the ROD.
OU 2 - An RD for groundwater is expected to be complete.
OU 6 - An RD will be completed for soil composting.
Sites 2, 201 (formerly Site B), 11 and 203 (formerly Site E) of OU 7 - The ROD is expected to be completed. An RA for soils will be completed late in FY96.
OU 8 - Implement a non-time critical removal action to stop volatile organic compound contamination migration from leaving the base. A pump and treatment system will utilize an air stripper in the treatment train. Anticipate operating by June 1996.
USTs 1 and 4 - An RA is expected to begin.

FY97

OU 2 - An RA for groundwater is expected to begin.
OUs 2 and 6 - An RA for soils is expected to be completed. Composting will be used to degrade ordnance compounds from the soils at Site 200 (formerly Site D) and Site 204 (formerly Site F). It will primarily be used to remove TNT. The treatment time is expected to be eight months for 1,600 cubic yards of soil.
Sites 11 and 203 of OU 7 - An RA will be underway for groundwater.
UST 1 - An RA is expected to be underway.
UST 4 - An RA is expected to be underway. Final removal action will begin.

BANGOR NSB
PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	30							
SI	24							
RI/FS	9	10	3					
RD		2	2			1		
RA	6			2		2	7	3
IRA	3(3)	3(3)				1(1)		4(4)
RC	24			1		2	7	4
Cumulative Response Complete	63%			66%		71%	89%	100%
UST	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
ISC								
INV		1	1					
CAP			1					
DES	1							
IMP		1					1	
IRA		1(1)						
RC		1					1	
Cumulative Response Complete		50%					100%	

JIM CREEK NAVAL RADIO STATION
JIM CREEK, WASHINGTON

Engineering Field Division/Activity: EFANW

Major Claimant: COMNAVCOMTELCOM

Size: 5,234 Acres

Funding to Date: $709,000

Estimated Funding to Complete: $5,290,000

Base Mission: Manages, operates and maintains a very low frequency (VLF) radio transmitting system, an electronic courier circuit for the receipt and delivery of messages and maintains the associated control circuits

Contaminants: Solvents, POLs, heavy metals

Number of Sites:

CERCLA:	9
RCRA Corrective Action:	0
RCRA UST:	0
Total Sites:	9

Relative Risk Ranking of Sites:

High:	0	**Not Evaluated:**	1
Medium:	0	**Response Complete:**	8
Low:	0	**Total Sites:**	9

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	8							
SI	3							
RI/FS								
RD								
RA								1
IRA			1(1)					
RC	8							1
Cumulative Response Complete	89%							100%

KEYPORT NAVAL UNDERSEA WARFARE CENTER
KEYPORT, WASHINGTON

Engineering Field Division/Activity:	EFANW
Major Claimant:	COMNAVSEASYSCOM
Size:	340 Acres
Funding to Date:	$16,640,000
Estimated Funding to Complete:	$39,693,000
Base Mission:	Originally tested torpedoes; expanded to include proving, overhaul and issue of torpedoes
Contaminants:	Chlorinated solvents, heavy metals, pesticides/herbicides, Otto fuel, POLs

Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	11	**High:**	6	**Not Evaluated:**	1
RCRA Corrective Action:	1	**Medium:**	1	**Response Complete:**	5
RCRA UST:	1	**Low:**	0	**Total Sites:**	13
Total Sites:	13				

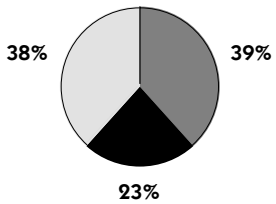
NPL

EXECUTIVE SUMMARY

Keyport Naval Undersea Warfare Center (NUWC), Washington is located on the Kitsap Peninsula in Puget Sound and is 15 miles west of Seattle, Washington. The NUWC is adjacent to a rural community, Keyport, Washington and close to another rural community, Poulsbo, Washington. The nearest urban area is Bremerton, Washington, which is eight miles to the southeast.

Operations that included plating, torpedo refurbishing and disposal practices contributed to contamination found at the NUWC. Environmental investigations since FY84 have identified several site types. Industrial and hazardous wastes were disposed of at the Keyport Landfill between the 1930's and 1970's. Hazardous materials included solvents, paints, sludge and otto fuel. Between the 1940's and 1960's at the drum spill site, contaminants including solvents, petroleum products, otto fuel, and pesticides were spilled so that drums could be reused. Sewer sludge containing inorganic compounds was disposed of from the 1940's to the 1970's at the Keyport Sludge Disposal Area. The shoreline around the station has been contaminated with wastes discharged through the sewers from 1915 until 1980. These wastes include plating wastes, paints, solvents, petroleum products, and otto fuels. Keyport NUWC was placed on the NPL in October 1989. The Navy has changed is operational processes to prevent further contamination. The sites ranked as high relative risk were so ranked primarily because of known contamination and identified migration pathways to both human and ecological receptors. Keyport NUWC is being cleaned up under a Federal Facility Agreement (FFA) which was signed in 1990 by the Department of the Navy and the State of Washington, Department of Ecology and the Attorney General.

Since Keyport NUWC is located on a peninsula, a shallow sea level aquifer and a deep artisan aquifer underlie the base. The deep aquifer is the primary source of water for the station, the shallow aquifer is not used. Surface drainage flows into Liberty Bay. Native American Indians have legal rights to half of the shellfish living in Liberty Bay, however, the Department of Health closed shellfish harvesting in Liberty Bay in 1991 due to fecal coliform. Shellfish tissue samples are being collected.



Current Status Of Sites

Studies Underway	5
Cleanups Underway	3
Response Complete	5
TOTALS	13

Surface drainage also flows into a shallow lagoon on the north and east side of the peninsula and into Dogfish Bay on the west side. Concentrations of contaminants measured in surficial sediment, surface water, and shellfish of Dogfish Bay were within normal ranges. This indicates that contaminants are not migrating out of the marsh area or are diluted and dispersed to such an extent that they cannot be detected in Dogfish Bay. Dogfish Bay is used for commercial oyster farming.

The Site Inspection (SI) found low concentrations of metals in soil and sediment of the stream and lagoon adjacent to Site 2. The SI also found significant concentrations of metals, petroleum hydrocarbons and undifferentiated halogenated organics in seeps and sediment of the marsh adjacent to Site 1 (Keyport Landfill). Concentrations of contaminants observed in the marsh may have potentially adverse impacts on the ecology of the marsh.

A Community Relations Plan (CRP) was completed in late FY90. Fact sheets are prepared on a frequent basis, a door-to-door community survey has been conducted, and six open houses and workshops have been held. A Technical Review Committee (TRC) was formed in FY89 and converted to a Restoration Advisory Board (RAB) in FY95. RAB members have reviewed, commented and approved work plans. RAB members have attended a RAB work group in San Francisco, and participated in a regional workshop for Puget Sound RABs.

At the end of FY95, five of the 13 Keyport NUWC sites were in the study phase, three were in the cleanup phase, and five are Response Complete (RC). Early removal actions include a removal in FY92 at a chromate spill site. An underground trench and several sumps were excavated and chromium-contaminated soil was removed and replaced with clean fill. Also in FY92, several Underground Storage Tanks (USTs) were removed at UST 1. Studies conducted include Remedial Investigation/Feasibility Study (RI/FS) activities for Sites 1, 2, 3, 5, 8 and 9 in early FY93. Due to public concerns regarding the Proposed Remedial Action Plan (PRAP), an additional RI is currently underway for Site 1.

Groundwater monitoring will start at Sites 2 and 8 in October 1996. Soil removal will be complete at Site 8 in FY98. Also in FY98, a Remedial Action (RA) is expected to be completed at all sites.

KEYPORT NUWC
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - Keyport NUWC is located on a peninsula. A shallow sea level aquifer and a deep artisan aquifer underlie Keyport NUWC. The deep aquifer is the primary source of water for the station, the shallow aquifer is not used. Surface drainage flows into Liberty Bay. Surface drainage also flows into a shallow lagoon on the north and east side of the peninsula and into Dogfish Bay on the west side. Concentrations of contaminants measured in surficial sediment, surface water and shellfish of Dogfish Bay were within normal ranges. This indicates that contaminants are not migrating out of the marsh area or are diluted and dispersed to such an extent that they cannot be detected in Dogfish Bay. The SI found low concentrations of metals in soil and sediment of the stream and lagoon adjacent to the Keyport Van Meter Road Spill (Site 2). The SI also found significant concentrations of metals, petroleum hydrocarbons and undifferentiated halogenated organics in seeps and sediment of the marsh adjacent to Site 1 (Keyport Landfill). Concentrations of contaminants observed in the marsh may have potentially adverse impacts on the ecology of the marsh.

NATURAL RESOURCES - Dogfish Bay is used for commercial oyster farming. Native American Indians have legal rights to half of the shellfish living in Liberty Bay, however, the Department of Health closed shellfish harvesting in Liberty Bay in 1991 due to fecal coliform. Shellfish tissue samples are being collected.

RISK - Using the Department of Defense (DOD) Relative Risk Ranking System, five sites and one UST site received a high relative risk ranking. These sites include a landfill, spill area, sludge disposal area, shoreline area and plating operations area. The primary contaminants at these sites are solvents, otto fuels, petroleum products, paints and plating wastes. Four of the sites have contaminants that are affecting groundwater. The landfill has wastes located below the water table. Surface aquifer discharges to an adjacent marsh which in turn drains to Liberty Bay, an arm of Puget Sound. This potentially impacts shallow drinking water wells, surface water, and marine sediments as well as humans, flora and fauna exposed to the water or sediments. The 5,000 feet of shoreline area (Liberty Bay) has contaminated surface water which is moved by tidal and other forces. To reduce risk at the Plating Area, Site 8, an underground trench and several sumps were excavated and chromium-contaminated soil was removed and replaced with clean fill.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - Keyport NUWC was included on the NPL on 4 October 1989 based on a Hazard Ranking System score of 32.61.

LEGAL AGREEMENTS - A Federal Facilities Agreement (FFA) was signed in April 1990 by the Department of the Navy and the State of Washington, Department of Ecology and the Attorney General.

PARTNERING - To improve site management, regulatory agencies are involved in developing the scope of work, and during document planning phases, technical memoranda are prepared to convey issues before document finalization. Concurrent document reviews are also conducted.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - A TRC was formed in FY89 and converted to a RAB in January 1995. The first formal RAB meeting was held in March 1995. The 20 RAB members have reviewed, commented and approved work plans. By-laws have been finalized. RAB members have attended a RAB work group in San Francisco, and participated in a regional workshop for Puget Sound RABs.

COMMUNITY RELATIONS PLAN - A Community Relations Plan (CRP) was completed in September 1990. Fact sheets are prepared on a frequent basis, a door-to-door community survey has been conducted, and six open houses and workshops have been held.

INFORMATION REPOSITORY - In FY89, an Administrative Record was established at the Naval Facilities Engineering Command (NAVFAC) Engineering Field Activity, Northwest (EFANW). Information Repositories are located at the central branch of the Kitsap County Library and the Poulsbo Branch. Copies of the Administrative Record documents (the official file) are available for public access in the Information Repositories.

KEYPORT NUWC
HISTORICAL PROGRESS

FY84

Sites 1-9 - An Initial Assessment Study (IAS) identified nine potentially contaminated sites. Sites 3-8 were determined not to pose a threat to human health or the environment. Sites 1, 2 and 9 were recommended for further investigation.

FY87

Sites 1, 2, 3, 5 and 9 - A Current Situation Report was completed for these sites. Sites 3 and 5, which were not recommended for further investigation in the IAS, were added at the Department of the Navy's (DONs) request, based on information obtained after the IAS was completed. The SI recommended further investigation of Sites 1, 2 and 9. In addition, the SI recommended a field survey to monitor for combustible gas and other organic vapors in soil and buildings at Site 1.

FY88

Site 1 - A landfill Gas Investigation was completed. Significant concentrations of methane were found in subsurface soil in the vicinity of Site 1. Concentrations of volatile organic compounds in the buildings were found to be well below the Occupational Safety and Health Act (OSHA) standards.
Sites 3 and 5 - Sampling was not conducted during the SI. Findings for these sites were based on existing reports and information which indicated the presence of Otto Fuel in subsurface soil and groundwater at Site 3 and metals in soil at Site 5. The SI recommended installing monitoring wells at Site 3 and conducting subsurface soil sampling at Site 5.

FY90

Site 8 - This site was added to the RI under the FFA that was signed by the Department of the Navy and the State of Washington, Department of Ecology and the Attorney General.
UST 1 - This site consists of 21 USTs. Groundwater was monitored for evidence of petroleum contamination and subsurface soil samples were collected. The Corrective Action Plan (CAP) was completed.

FY91

A RCRA Facility Assessment (RFA) field investigation was conducted by the State of Washington Department of Ecology. Keyport NUWC has not received an RFA final report.
Site 22 - This site was discovered while a utility duct trench was being excavated. Fill materials, including metal piping and shavings, plastic battery casings, bricks, municipal trash and a torpedo, were found and removed during a construction project. Site 22 is immediately adjacent to Site 1 (Keyport Landfill) and it was determined that the landfill extended further than originally anticipated. No additional debris was found during the SI; therefore, No Further Action (NFA) is recommended at Site 22.

FY92

Sites 10-21 - These sites are located at Naval Ordnance Center (NOC) Port Hadlock and are no longer a part of Keyport NUWC.
Site 8 - A removal action was completed. An underground trench and several sumps were excavated and chromium-contaminated soil was removed and replaced with clean fill.
UST 1 - Interim Corrective Measures (tank removals) were completed.

FY93

Sites 7 and 22 - An SI was completed at these two sites. Site 7 was addressed in the IAS, but was determined not to pose a threat to human health or the environment and was not recommended for further investigation. Soil and groundwater contaminated with chlorinated solvents were discovered during military construction projects that were conducted in the area. The SI showed contamination below background levels, therefore, NFA is recommended.
Sites 1, 2, 3, 5, 8 and 9 - An RI/FS was conducted.

FY94

Sites 2, 3, 5, 8 and 9 - A Record of Decision (ROD) was signed for OU 2. NFA is required at Sites 3, 5 and 9. Confirmational sampling and monitoring will be conducted at Sites 2, 5, 8 and 9.
UST 1 - Interim Corrective Measures (tanks filled with concrete) was completed for eight tanks. Groundwater is being monitored for evidence of petroleum contamination, and subsurface soil samples were collected.

PROGRESS DURING FISCAL YEAR 1995

FY95

Site 1 - Some temporary buildings located above the landfill at Site 1 were vacated and removed as a precautionary measure.
Site 23 - An RFI/SI was completed. Site 23 consists of hazardous waste storage tanks and sumps at 83 locations that were identified during the RFA. Probable contaminants are solvents and petroleum products sludge (petroleum/oil/lubricants). Corrective Action (CA), consisting of removal and closure was completed.
Sites 2, 5, 8 and 9 - Confirmational sampling and monitoring plans were finalized.
Site 8 - A Phase I RA was conducted.
Site 23 - A CA consisting of removal and closure, began. Site 23 consists of hazardous waste storage tanks and sumps. Probable contaminants include solvents and petroleum products.
UST 1 - RD was completed.

PLANS FOR FISCAL YEAR 1996

FY96

Site 1 - Pre-ROD sampling will be completed in FY96. An RI/FS is expected to be completed in December 1996.
Site 8 - This site will undergo Phase II soil removal. Work plans for Phase II will be started in FY96. An RA is anticipated to be completed in FY98.
Sites 2 and 8 - Groundwater monitoring will start in FY96.
UST 1 - Corrective Measures will be completed at all 14 tanks. The Corrective Measures may consist of tank and soil removal, or in-situ remediation of contaminated soil. Groundwater treatment may be performed, based on results of groundwater monitoring to meet regulatory requirements.

KEYPORT NUWC
PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	9			1				
SI	7							
RI/FS	4	1	1					
RD								
RA		2						3
IRA	1(1)	1(1)	1(1)			1(1)		
RC	5		2	1				3
Cumulative Response Complete	45%		64%	73%				100%
RCRA CA	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
RFA	1							
RFI			1					
CMS								
DES								
CMI						1		
IRA								
RC						1		
Cumulative Response Complete						100%		
UST	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
ISC								
INV								
CAP	1							
DES		1						
IMP			1					
IRA								
RC			1					
Cumulative Response Complete			100%					

PORT HADLOCK NAVAL ORDNANCE CENTER, PACIFIC DIVISION DETACHMENT
KEYPORT, WASHINGTON

Engineering Field Division/Activity:	EFANW
Major Claimant:	COMNAVSEASYSCOM
Size:	2,716 Acres
Funding to Date:	$5,368,000
Estimated Funding to Complete:	$15,352,000
Base Mission:	Receives, stores, maintains and issues ordnance
Contaminants:	TNT, heavy metals (arsenic, cadium), volatile organic compounds

Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	16	**High:**	5	**Not Evaluated:**	0
RCRA Corrective Action:	0	**Medium:**	1	**Response Complete:**	9
RCRA UST:	0	**Low:**	1	**Total Sites:**	16
Total Sites:	16				

NPL

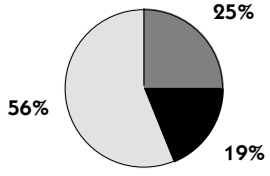
EXECUTIVE SUMMARY

Port Hadlock NOC is located on Indian Island in northeastern Jefferson County, Washington, at the northern end of Puget Sound, near the town of Port Townsend. The primary source of contamination has been from landfills and ordnance disposal. Port Hadlock has served as an ammunition storage and submarine net depot since 1939. Primary contaminants at Port Hadlock NOC are TNT, heavy metals, the chemical additive PCBs, other ordnance compounds such as RDX and volatile organic compounds. The media affected by these contaminants has been groundwater, surface water/sediments, and soil. The Navy has changed its operational processes to prevent further contamination.

Environmental investigations since 1984 have focused on cleaning up and preventing future contamination of shellfish beds which are located near the installation. Contaminants can migrate via groundwater and overland flow into the bays or can migrate by soil to the sea-level aquifer. The bays are used for both recreational and commercial fishing. A Current Situation Report, completed in FY88, found trace metals (including lead), organics, and petroleum hydrocarbons in shellfish near the north end landfill. A study completed in 1993 found similar results. Sediments have shown no contamination.

Certain areas of Port Hadlock are eligible for the National Register for Historical Places. Sites 10, 11 and 12 have Native American archeological concerns because these areas were actively used by Native American tribes. Site 10 has large shell deposits called middens that were used for ceremonies. The midden at Site 10 was tested and shown to be over 2,000 years old. Site 11 includes burial grounds. Native American Tribes have been consulted on cleanup issues at Port Hadlock.

Indian Island is in a rural setting surrounded by Puget Sound and is connected to the main land by two bridges. There are threatened and endangered species in the vicinity. Nine active bald eagle nests are on the Island. Site 21 sits between the only two drinking water wells. These wells are no longer used, as water is piped in from Port Townsend. Sites 10, 11 and 12 are adjacent to wetlands. The local community is mostly concerned about the shellfish beds, and groundwater, as many local wells have been impacted by saltwater intrusion..



Current Status Of Sites

Studies Underway	4
Cleanups Underway	3
Response Complete	9
TOTALS	16

Community relations are an ongoing effort. The Community Relations Plan (CRP) was finalized in FY92 and is in the process of being revised. A series of fact sheets for the installation cover topics such as state involvement and oversight, the Site Hazard Assessment program, and the results of shellfish and sediment sampling. The TRC was converted to a Restoration Advisory Board (RAB) in FY95. There are 30 RAB members from regulatory agencies, local Native American Tribes, and the community. The Navy had an open house for the RAB in July 1995.

At the end of FY95, four of the 16 sites at Port Hadlock NOC were in the Study Phase, three were in the Cleanup Phase, and nine were Response Complete (RC). In FY87, a removal action was conducted at Site 17. A tank was removed and gas was vented to complete Remedial Action (RA) at this site. An RA has been completed at Sites 13 and 16. Underground Storage Tanks (USTs) were removed at Site 16 in FY91 and tanks and soil were removed at Site 13 in FY91 and FY94. Soils contaminated with ordnance have been removed from Sites 11 and 12 and petroleum contaminated soils have been removed from Site 18.

In FY96, an RA at Site 10 will begin. This RA will involve construction of a landfill cap and a shoreline protection system. The RA will be completed in FY97. Long term groundwater monitoring and shellfish monitoring will follow the RA. Compliance monitoring will continue at Site 12 in FY96. At Site 34, the SI will be completed in FY97. A removal action is anticipated at this site. An RA will be completed at Site 21 in FY97.

Bio-geo-engineering has been applied to protect the shoreline at Site 10. The bank was eroding and spilling landfill contents onto the beach. Working with Native Tribes and State Agencies such as Department of Wildlife, Department of Natural Resources, and Department of Ecology, this problem has been solved by planting selected vegetation on the bank. Partnering with regulators and the public allowed the Navy to complete a cleanup at Site 11. After the cleanup, it was agreed no further study would be required, saving over two million dollars. The site has been proposed for delisting from the Washington State Hazardous Sites List. Partnering with regulators and the community will also expedite cleanup at Site 23 as was done at Site 11. The cleanup should prevent further study by solving the problem up front.

PORT HADLOCK NOC PAC DIV DET
RELEVANT ISSUES

ENVIROMENTAL RISK

HYDROGEOLOGY - The aquifer at Site 21 is very deep and flat. It is over 150 feet deep. The groundwater at Site 34 has been found to be perched aquifer about 20 feet deep. Surface runoff goes to the bay, which supports commercial shellfish beds. Sites 10, 11, 12 and 18 are near shoreline. The landfill sits partially below sea level. It has been shown that contaminants transport via groundwater to the shellfish beds off Site 10. Two drinking water wells near Site 21 are not used and have not been sampled for many years. Contaminants can migrate via surface and groundwater on Indian Island. Surface runoff does not follow defined channels but flows overland into the bays surrounding the island. These bays are used for recreational and commercial fishing. Contaminants can also migrate to the sea level aquifer. The primary water supply for Indian Island is imported via a pipeline from Port Townsend, however, two backup wells are maintained that tap the sea level aquifer. Because of the tides, some of the Port Hadlock sites can only have cleanup activities scheduled for certain times of the year.

NATURAL RESOURCES - Several beaches around Port Hadlock are productive shellfish propagation areas. A Current Situation Report, completed in FY88, found trace metals, including lead, organics, and petroleum hydrocarbons in shellfish near Site 10 (North End Landfill). Threatened or endangered bird species in the Port Hadlock area include the bald eagle, the American Peregrine Falcon, and the Aleutian Canadian Goose. Site 11 (Walan Point) is adjacent to a bird sanctuary and a wetland that provide habitats for threatened and endangered species.

RISK - Five sites at Port Hadlock received a high relative risk ranking using the DOD Relative Risk Ranking System. All sites have groundwater contamination. The landfill site, Site 10, also has contaminants in sediments. Receptors are human and ecological, threatened and endangered species. There is evidence of unacceptable risk from eating shellfish harvested from the wetlands and shoreline areas which are adjacent to the landfill. Sites 11 and 12 are former ordnance disposal areas. Site 11 is also adjacent to wetlands and shoreline areas. Site 21 was used for disposal in the 1940's. Soils contaminated with ordnance were removed from Sites 11 and 12 in FY94. Soil containing metallic refuse and other debris was removed from Sites 11 and 12 in FY95. Remedial action involving a landfill cap at Site 10 will be completed in FY97. Site 10 will also have a shoreline protection system and groundwater and shellfish monitoring. Remedial action at Site 21 will be completed in FY97. The Agency for Toxic Substances and Disease Registry (ATSDR) completed a Public Health Assessment in 1995. Recommendations were made for further shellfish monitoring. No immediate concerns were found.

RESTORATION PROJECTS - Removal actions at Site 11 (Walan Point) included salvaging and transplanting selected native plants to twelve capillary beds. The beds were maintained and watered on a regular basis throughout the removal actions. In addition, seeds of selected native species (shrubs and herbs) from areas within and adjacent to the construction zone at Site 11 were collected, cleaned, and dried. After all removal actions were completed at Site 11 and Site 12 (Griffin Street), a successful vegetative restoration program was conducted. Site 10 is undergoing restoration to improve marine habitat as part of the shoreline protection system.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - Port Hadlock was listed on the National Priorities List (NPL) in June 1994 based on a Hazard Ranking System (HRS) score of 50.00. The landfill at Site 10 has contributed to contamination of the surrounding beaches through erosion and groundwater. It is a critical site and contributed heavily to the NPL scoring. The site is eligible for the National Register for Historical Places.

LEGAL AGREEMENTS - An Interagency Agreement (IAG) is being negotiated with the State of Washington and EPA Region X.

PARTNERING - Partnering with regulators and the public allowed a fast cleanup at Site 11, precluding the need for an RI/FS. This saved the Navy over two million dollars. The site was listed as no further action in the ROD signed in August 1995. Also, the State of Washington has proposed it for delisting from the Washington State Hazardous Sites List.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - A Technical Review Committee (TRC) was formed in 1988. The TRC was converted to a Restoration Advisory Board (RAB) in July 1995. There are 30 RAB members from regulatory agencies, local Native American tribes, and the community. The RAB meets once a month and minutes are mailed to all members. The Navy had an open house for the RAB in July 1995.

COMMUNITY RELATIONS PLAN - The Community Relations Plan (CRP) was finalized in FY92 and is currently being revised. A series of fact sheets for the installation cover topics such as state involvement and oversight, the Site Hazard Assessment program, and the results of shellfish and sediment sampling.

INFORMATION REPOSITORY - The Administrative Record was established in the 1980's. An Information Repository, containing copies of the Administrative Record documents, is available to the public at the Port Hadlock Library.

Port Hadlock NOC PAC DIV DET HISTORICAL PROGRESS

FY79-FY90

Site 10 - The SI was completed. Trace metals (including lead), organics, and petroleum hydrocarbons were found in soil, sediment, and shellfish. An RI/FS was recommended.
Site 17 - A tank was removed and field monitoring of explosive gas concentrations was completed. The RA was completed and involved the installation of piping and fans to vent the methane gas in the tank, which reduced methane gas levels to below explosive level.
Site 21 - An SI was completed. Halogenated hydrocarbons and poly-nuclear aromatic hydrocarbon were found in the soil. An RI/FS was recommended.

FY91

Sites 11, 12, 15, 18-20 and 22 - The State of Washington Department of Ecology issued an Enforcement Order for NOC Port Hadlock. The state's primary concerns involved ordnance contamination at sites that were not recommended for further action in the PA. As a result of negotiations between the Department of the Navy and the State of Washington, a Site Hazard Assessment (equivalent to an SI) was conducted for these sites.
Site 13 - One 3,000 gallon tank leaked; less than 500 gallons were lost and the tank was repaired. Later that year, the same tank failed a precision tightness test. The RA consisted of tank removal and removal of petroleum contaminated soils. The soils were landfarmed on site to reduce levels to below regulatory limits.
Site 15, 19, 20 and 22- These sites were recommended for no further action.
Site 16 - Removal action of the underground storage tanks was completed.
Site 18 and 20 - It was determined that more extensive sampling and analysis needed to be conducted to further characterize the nature and extent of the contamination before the site would be recommended for an RI/FS.

FY93

Site 11 - This site was recommended for removal action and an RI/FS.
Site 12 - This site was recommended for removal action.
Site 18 - The SI was completed and a removal action was recommended.
Site 20 - The SI was completed.
Site 30 - The SI was completed at this sites that was identified during construction of a vehicle wash area. Contamination consisting of diesel and heavy oils in soils was verified.

FY94

Site 13 - Petroleum-contaminated soil was removed and landfilled off site.
Site 30 - A removal action consisting of removing petroleum contaminated soil and landfilling of the site was completed. No further action is anticipated.
Site 33 - This site was added to the program. An SI is planned.

PROGRESS DURING FISCAL YEAR 1995

FY95

Sites 11, 12, and 18 - Interim Removal Action (IRA) was completed. Sites 11 and 12 have Native American archeological concerns. Soil containing metallic refuse and other debris was removed from Sites 11 and 12 and placed at an approved disposal facility. Site 18 was a catch basin for drain pipes and contained sediments contaminated with Polynuclear Aromatic Hydrocarbons (PAHs). These sediments were removed. Compliance monitoring at these three sites began to determine if the removal action was effective. A ROD was signed in August listing these sites as No Further Action (NFA). Monitoring was completed for Sites 11 and 18.
Sites 10 and 21 - A Record of Decision (ROD) was signed. This ROD presents the selected remedial action for Sites 10 and 21. The landfill at Site 10 has contributed to contamination of the surrounding beaches through erosion and groundwater. It is a critical site and contributed heavily to the NPL scoring. The site is eligible for the National Register for Historical Places. Remedial action will include capping the landfill and installing a shoreline protection system along the perimeter of the landfill to keep landfill contents from eroding onto the beach. This shoreline protection system will incorporate bio-geo-engineering techniques. The ROD specifies groundwater monitoring for two years at Site 21, and old fill area, to determine whether the detections of certain chemicals in the groundwater during the RI were anomalous.
Site 34 - A new site was identified. Site 34 is an Open Burn/Open Detonation Area. A Site Inspection (SI) began to determine the extent of contamination at this new site.
Sites 11, 12, 15, 18, 20, 22 - An NFA ROD was signed in September 1995.

PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Site 10 - RD will be completed. RA will begin of landfill cap and shoreline protection system.
Site 12 - Compliance monitoring will continue at this site.

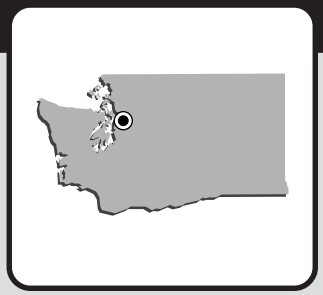
FY97

Site 10 - RA will be completed. Long term groundwater monitoring and shellfish monitoring will begin following construction of cap and shoreline protection system.
Site 21 - Groundwater monitoring, as specified in the ROD signed in 1995, should be completed, and this is expected to be the final RA.
Site 34 - The SI will be completed. A removal action is anticipated at this site.

PORT HADLOCK NOC PAC DIV DET PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	13							
SI	10			2				
RI/FS		5		1	1			
RD		4	1	1		1		
RA	3	1		1	1	3	1	
IRA	3(3)	2(2)		1(1)			1(1)	
RC	8	1			1		2	4
Cumulative Response Complete	50%	56%			62%		75%	100%

Puget Sound Fleet and Industrial Supply Center Bremerton
Puget Sound, Washington



Engineering Field Division/Activity: EFANW

Major Claimant: COMNAVSUPSYSCOM

Size: 29 Acres

Funding to Date: $5,624,000

Estimated Funding to Complete: $8,287,000

Base Mission: Procures equipment and services for naval activities

Contaminants: Heavy metals, scrap metal, PCBs

Number of Sites:

CERCLA:	1
RCRA Corrective Action:	0
RCRA UST:	0
Total Sites:	1

Relative Risk Ranking of Sites:

High:	1	Not Evaluated:	0
Medium:	0	Response Complete:	0
Low:	0	Total Sites:	1

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	1							
SI	1							
RI/FS			1					
RD								
RA						1		
IRA	1(1)							
RC						1		
Cumulative Response Complete						100%		

Puget Sound Fleet and Industrial Supply Center Manchester
Puget Sound, Washington

Engineering Field Division/Activity: EFANW

Major Claimant: COMNAVSUPSYSCOM

Size: 234 Acres

Funding to Date: $6,592,000

Estimated Funding to Complete: $1,345,000

Base Mission: Supplies fuels and lubrication oils to fleet and shore activities

Contaminants: PCBs, heavy metals, POLs

Number of Sites:

CERCLA:	2
RCRA Corrective Action:	0
RCRA UST:	2
Total Sites:	4

Relative Risk Ranking of Sites:

High:	1	Not Evaluated:	0
Medium:	0	Response Complete:	2
Low:	1	Total Sites:	4

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	2							
SI	2							
RI/FS	1							
RD	1							
RA			1					
IRA								
RC	1		1					
Cumulative Response Complete	50%		100%					

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC		1						
INV		1						
CAP								
DES								
IMP						1		
IRA								
RC		1				1		
Cumulative Response Complete		50%				100%		

PUGET SOUND NAVAL HOSPITAL BREMERTON
BREMERTON, WASHINGTON

Engineering Field Division/Activity: EFANW

Major Claimant: BUMED

Size: 48 Acres

Funding to Date: $0

Estimated Funding to Complete: $77,000

Base Mission: Provides clinic and hospital services; originally used for ammunition storage and ordnance demilitarization

Contaminants: Solvents, heavy metals, POLs

Number of Sites:

CERCLA:	0
RCRA Corrective Action:	0
RCRA UST:	1
Total Sites:	1

Relative Risk Ranking of Sites:

High:	1	Not Evaluated:	0
Medium:	0	Response Complete:	0
Low:	0	Total Sites:	1

PROGRESS AND PLANS

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC								
INV								
CAP								
DES								
IMP								1
IRA				1(1)				
RC								1
Cumulative Response Complete								100%

Puget Sound Naval Shipyard
Bremerton, Washington

Engineering Field Division/Activity:	EFANW
Major Claimant:	COMNAVSEASYSCOM
Size:	1,392 Acres
Funding to Date:	$45,877,000
Estimated Funding to Complete:	$64,873,000
Base Mission:	Provides logistic support for assigned ships and service craft; performs authorized work in connection with construction, overhaul, etc.
Contaminants:	Heavy metals, grit, paint, solvents, construction debris, acids, silver nitrate

Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	14	**High:**	18	**Not Evaluated:**	1
RCRA Corrective Action:	3	**Medium:**	1	**Response Complete:**	13
RCRA UST:	16	**Low:**	0	**Total Sites:**	33
Total Sites:	33				

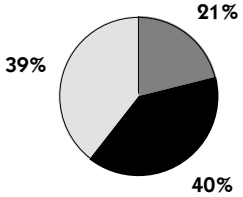
NPL

EXECUTIVE SUMMARY

The Puget Sound Naval Shipyard (PSNSY) is located across the Sound, west of Seattle, Washington. The shipyard sits on a peninsula that is bordered on the south, east, and north by various bays and inlets of Puget Sound. PSNSY is bordered to the north by the City of Bremerton. The majority of the PSNSY is built on contaminated fill material. This fill material acts as a continuing source of contaminants.

Jackson Park Housing was originally included in the Naval Submarine Base Bangor Initial Assessment Study (IAS) but has since been moved into the PSNSY Installation Restoration Program (IRP) due to a change in ownership. The entire eastern edge of Jackson Park and Naval Hospital consists of shoreline (tide flats). The base is located directly on Ostrich Bay, which is part of Dyes Inlet. The main sources of contamination at Jackson Park are related to past operations. Ammunition and fuel oil were stored and handled, dry waste powders were collected and burned along the northern shore, liquid ammunition wastes were collected into an ammunition recovery system and were also washed into floor drains during daily cleaning of the industrial buildings. The wastewater drained directly to Ostrich Bay. The Navy has changed its operational processes to prevent further contamination. All sites at PSNSY and Jackson Park were evaluated in scoring the sites for inclusion on the National Priorities List (NPL). Both PSNSY and Jackson Park Housing were listed on the NPL in May 1994.

Both PSNSY and Jackson Park had Technical Review Committees (TRCs) that were converted to Restoration Advisory Boards (RABs) in September 1994. The RABs held their first meetings in October 1994. The RABs meet monthly and membership includes Native American Tribes in the local area, community representatives, regulatory agencies, and the Navy. Both RABs were actively involved in an Environmental Cleanup Information Fair in May 1995 at the Kitsap Regional Library. Visual and hands on displays described the cleanup work at PSNSY and Jackson Park. RAB members and regulators, including the Agency for Toxic Substances and Disease Registry (ATSDR), answered questions and distributed handouts.



Current Status Of Sites

Studies Underway	7
Cleanups Underway	13
Response Complete	13
TOTALS	33

At the end of FY95, four of the twenty-nine sites at PSNSY were in the Study Phase, twelve were in the Cleanup Phase, and thirteen are Response Complete. Sampling and analysis of soils was conducted at Sites 104, 105, and 106 (OU B) to gain further understanding of the cleanup required in the industrial area of PSNSY. Also, 200 sea cucumbers were collected from Sinclair Inlet and Rich Passage for physical and chemical analysis. The sea cucumbers collected from Rich Passage were used as a baseline for reference. Rich Passage is open to harvesting and 45 tons are harvested annually. The information collected will be used to complete the Remedial Investigation/Feasibility Study (RI/FS). Remedial Design (RD) is planned and is anticipated to be completed at one NSY site in FY96.

At the end of FY95, three of the four sites at Jackson Park were in the Study Phase and Site 110 was in the Cleanup Phase. In FY96, FSs are expected to be complete at Sites 101, 102, and 103. In FY97, RD at all sites will be completed. A small landfill was discovered during construction at Site 110. A time critical removal action was initiated to protect the health and safety of the residents and workers.

PSNSY and Jackson Park have taken steps to accelerate cleanups and facilitate discussions with the regulators and other agencies. Both installations have a Memorandum of Understanding with the U.S. Geological Survey (USGS). USGS provides technical support and has conducted a detailed study of the Puget Sound drydock system to determine the effect the docks may have on groundwater flow.

An innovative technology in use at PSNSY is steam sparging. Two 4.9 million gallon concrete Underground Storage Tanks (USTs) leaked large amounts of Bunker C oil into the subsurface environment. Steam sparging, which entails the injection of steam into the ground to lower the viscosity of the contaminant, allows the product to be drawn to extraction wells for removal and recycling. This technology will eliminate an extensive RI/FS at the site. Community members are very appreciative of this simple yet cost-effective measure to reduce hazardous wastes in Puget Sound.

PUGET SOUND NSY
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - Direct recharge from precipitation is the major source of water to the aquifer groundwater system in the PSNSY area. Because there are no major streams in the area, all water from precipitation must either run-off to storm sewers, return to the atmosphere, or percolate to the water table. All groundwater must either discharge directly to Sinclair Inlet, to springs along the shoreline, or to the drydock at the Shipyard. The shipyard and the entire area surrounding it are served by public water systems. There are few wells in the area other than the monitoring wells at PSNSY. Similarly, Jackson Park Housing Complex and Naval Hospital are served by public water. Direct recharge from precipitation is the major source of water to the aquifer. There is a small stream that passes through the base during the winter, but dries up in the summer. All storm water discharges into Ostrich Bay via surface water runoff, as groundwater that seeps along the beach, or through the storm water system.

NATURAL RESOURCES - Water is the predominant natural resource in the area. Sinclair Inlet and Ostrich Bay are rated as Class A (Excellent) bodies of water according to the State of Washington. Under this classification, water uses to be protected include anadromous salmon migration and rearing, commercial fish and shellfish reproduction and harvesting, boating, fishing, aesthetics and water contact recreation, industrial water supply and navigation.

The only known federal endangered species in Kitsap County are the bald eagle and spotted owl.

RISK - Baseline Human Health Risk Assessments have been completed for Sites 2 and 3 at PSNSY. Marginal risk exists from exposure to soils but that risk has been reduced since the recent paving of the sites. A risk exists for eating fish and shellfish collected from Sinclair Inlet. The State currently recommends not collecting shellfish from Sinclair Inlet. Fishing is not restricted at this time.

Fourteen sites at PSNSY received a high relative risk ranking in the DOD Relative Risk Ranking System. Many of these sites are in close proximity to the Sinclair Inlet. Groundwater contaminated with heavy metals, the chemical additive PCB, and battery acids, discharges into Sinclair Inlet. Receptors include marine fauna, shellfish, and sediment burrowing organisms that may then result in uptake through the food chain. Native Americans have fishing rights to the Sinclair Inlet.

Currently at PSNSY, terrestrial risk has been reduced by paving all sites and establishing a protocol for excavations within sites when necessary for utility work and repairs.

The risks from Jackson Park and Naval Hospital are primarily attributed to shellfish consumption. There is an additional risk from soil intake in a lifetime exposure. Four sites at Jackson Park have a high relative risk ranking. Previous to becoming a military residence, operations in the Jackson Park area, along the shoreline of Ostrich Bay, included ordnance production and demilitarization. Liquid wastes were generated when ordnance production areas were washed down. Wastewater was discharged directly into Ostrich Bay. Ecological receptors are shellfish. Analytical results for surface water showed concentration of metals. Analytical results for marine sediments showed detectable concentrations of Semi-volatile Organic Compounds (VOCs), ordnance and metals. The close proximity of the groundwater to the shoreline provides an additional potential pathway to sediments.

The Agency for Toxic Substance and Disease Registry (ATSDR) conducted site visits in February 1993 at PSNSY and in November 1993 at Jackson Park for the purpose of gathering information used in the preparation of a Public Health Assessment. Site summaries and site rankings were provided by ATSDR in June 1994. PSNSY received a "D" ranking and Jackson Park received a "C" ranking. Both rankings indicate a low priority for a full health assessment.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - All sites at PSNSY and Jackson Park were evaluated in scoring the sites for inclusion on the National Priorities List (NPL). Both PSNSY and Jackson Park Housing were listed on the NPL in May 1994. The Hazard Ranking System (HRS) score for both activities was 50.00.

LEGAL AGREEMENTS - A Federal Facilities Agreement (FFA) is not planned for PSNSY or Jackson Park at this time. The shipyard applied for a RCRA Part B permit. As a result, a RCRA Facility Assessment (RFA) for PSNSY was finalized by EPA Region X, and received by the Department of the Navy in December 1992. The facility is still in Interim Status and in August 1995 filed an updated Part B permit application with the state. No corrective actions have been initiated at this time and it is anticipated that CERCLA actions will accomplish any corrective actions necessary. All Jackson Park sites are being handled under CERCLA. Jackson Park is a housing area and does not have a RCRA permit or any RCRA associated activities ongoing.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - Jackson Park formed its Technical Review Committee (TRC) in FY91. PSNSY formed its TRC in FY92 and the group met quarterly. Both TRCs enabled the Navy to involve the regulatory agencies in scoping phases of studies and decision-making. The TRCs were converted to Restoration Advisory Boards (RABs) in September 1994. The RABs held their first meetings in October 1994. The RABs meet monthly and membership includes Native American Tribes in the local area, community representatives, regulatory agencies, and base personnel. Board members include a fishing specialist for the Tribes, a representative from the National Oceanic and Atmospheric Administration and a health specialist.

Both RABs were actively involved in an Environmental Cleanup Information Fair in May 1995 at the Kitsap Regional Library. Visual and hands on displays described the cleanup work at the Shipyard and Jackson Park. RAB members and regulators, including the Agency for Toxic Substances and Disease Registry (ATSDR), answered questions and distributed handouts.

COMMUNITY RELATIONS PLAN - In FY92, a Community Relations Plan (CRP) for Jackson Park was completed. A CRP was completed for PSNSY in early FY93. Both CRP were updated in FY95 to include the NPL status of the facilities and reflect the formation of the RABs.

INFORMATION REPOSITORY - The Administrative Record for PSNSY and Jackson Park is maintained at EFA Northwest in Pouslbo, Washington. Information Repositories for PSNSY were established in 1992 at the three branches of the Kitsap Public Library (Downtown and Central Branches) and the Port Orchard Library. Four Information Repositories were established in 1992 for Jackson Park, one at each of the three branches of the Kitsap Public Library and one at the Jackson Park Community Center.

Puget Sound NSY
HISTORICAL PROGRESS

FY83

Sites 1-11 - An Initial Assessment Study(IAS), equivalent to a Preliminary Assessment (PA), identified six potentially contaminated sites at Naval Shipyard (NSY) Puget Sound. A supplemental PA in FY90 identified an additional five potentially contaminated sites. Of these sites, nine were recommended for further investigation.
Sites 101-108 - A draft IAS was completed at Jackson Park Housing and identified eight sites. Two sites (Sites 101 and 103) were recommended for further investigation, six sites (Sites 102, 104-108) were recommended for No Further Action (NFA).

FY88

Sites 101, 102 and 104-108 - A PA was completed for these sites.
Sites 101 and 103 - A Current Situation Report, equivalent to a Site Inspection (SI) for Jackson Park Housing was completed. The SI found low concentrations of picramic acid, and the following volatile and semi-volatile organic compounds: phthalate, methylene chloride, and trichloro-ethylene in surface water. Also found were elevated levels of picramic acid and phthalates in shellfish and fish tissue. Elevated levels of heavy metals (copper, lead, and zinc) were detected in surface water, but these levels may be related to existing residential storm water contributions and not to previous installation activities. The SI recommended further investigation of Sites 101 and 103. After completion of the SI, Site 101 was divided into two sites: Ordnance and Wastewater Discharges (Site 101) and South Jackson Park Beach (Site 101A).

FY90

Site 6 - The SI was completed.
Sites 1-6 - A supplemental PA was completed for these sites.
Sites 7-11 - The supplemental PA identified these five new sites.
Sites 01, 03, and 6-11 - These eight sites were recommended for an SI due to suspected soil, sediment, and groundwater contamination
Sites 4 and 5 - Recommended for No Further Action (NFA). The sites pose no threat to human health or the environment.

FY92

UST 1 - An Underground Storage Tank (UST) Validation Report was prepared. The study identified 26 tanks that are currently abandoned. Nine of the abandoned tanks were removed. Of these tanks, three had leaked extensively.
Sites 1-3 and 7-10 - The SI was completed.
Sites 1-10 - Recommended for an RI/FS.
Sites 1-3 and 6-11 - The State of Washington Department of Ecology issued an Enforcement Order for PSNSY. The Enforcement Order required the Department of the Navy (DON) to complete a Remedial Investigation/ Feasibility Study (RI/FS) and cleanup action plan and to submit proposals for Interim Remedial Action (IRA) alternatives to reduce exposure of on-site workers to contaminated surface soil.

FY93

Site 110 (Jackson Park Uplands) - An SI was completed. Site 110 consists of a consolidation of Sites 102, 104, 105, 106, 107 and 108. The sites comprising Site 110 were reinvestigated as a result of a February 1992 Enforcement Order issued by the State of Washington, Department of Ecology.
Sites 101, 101A, 103 and 115 - The Enforcement Order also required that an RI/FS be conducted at Sites 101, 101A, 103 and 115. Site 115 consisted of the marine waters, sediment, and biota that have been contaminated with hazardous substances as a result of past site activities; this site has since been incorporated into Sites 101, 101A and 103.

FY94

Site 2 - A removal action was completed to remove soil contaminated with lead, the chemical additive PCB, mercury, and TPH. The soil was excavated and disposed of off-site at an approved disposal facility.
Site 3 - An RI/FS was completed.
Site 102 (South Jackson Park) - A 100,000 gallon tank, a smaller tank, and the surrounding soil were removed to mitigate visible oil seepage along South Jackson Park Beach, which may have resulted from leaks from the tank or its associated piping.
Site 110 - Two soil removal actions have been completed. During the removal, additional contamination was found. Soil excavated from Site 110 has been thermally treated.
UST 1 - Five tanks were removed. There was no evidence of leakage and no further action is required. The remaining 22 abandoned tanks were removed.

PROGRESS DURING FISCAL YEAR 1995

FY95

Sites 1-12 - Removed 12 tanks and any accessible contaminated soil. Handling many tank areas under one mobilization saved the government time and money.
Site 6 - In the waters of the Puget Sound, divers from PSNSY removed a considerable amount of hazardous debris, compressed cylinders, paint cans, and other assorted wastes.
Sites 104, 105 and 106 (OU B) - Sampling and analysis of soils was conducted to gain further understanding of the cleanup required in the industrial area of PSNSY. The presence of the chemical additive PCB and arsenic was evaluated. Also, 200 sea cucumbers were collected from Sinclair Inlet and Rich Passage for physical and chemical analysis. The sea cucumbers collected from Rich Passage were used as a baseline for reference. Rich Passage is open to harvesting and an average of 45 tons are harvested annually. The information collected will be used to complete the Remedial Investigation/Feasibility Study (RI/FS).
Sites 101, 102, 103 (Jackson Park Housing) - Soil and groundwater sampling and analysis was conducted. Remedial Investigation (RI) was completed.
Site 11 - An Innovative Technology Demonstration Program involving steam sparging was used to heat the Bunker C fuel that has contaminated soils and groundwater and then mobilize the fuel to points where it can be pumped and removed. The SI for Site 11 was completed.
Site 10 (Landfill Areas, Waterfront Areas) - During the SI, Site 10 was divided into three individual sites (Sites 10C, 10W, and 10E) for central, west, and east, respectively.
Site 110 - Soil excavated was thermally treated.
UST 1 - Corrective Action for all tanks was completed.
Sites 1-3 and 6-10 - Decision Documents were completed.
Sites 1, 2 and 6-10 - An RI/FS was completed.

PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Sites 101-103 (Jackson Park Housing) - Feasibility Study is expected to be completed.
Sites 1 - 3 and 6-10 - RD is planned and is expected to be completed.

FY97

Site 11 - Steam sparging of subsurface water contaminated with Bunker C oil will be completed.
Sites 101-103 (Jackson Park Housing) - RD for Jackson Park Housing is expected to be completed.

PUGET SOUND NSY
PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	14							
SI	11	1						
RI/FS		1	1	3	6			
RD			1					
RA						8	1	3
IRA		9(9)		1(1)		1(1)		
RC	2					6	1	5
Cumulative Response Complete	15%					57%	69%	100%
RCRA CA	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
RFA	3							
RFI	3							
CMS		2	1					
DES								
CMI						2		1
IRA	1(1)	1(2)						
RC								3
Cumulative Response Complete								100%
UST	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
ISC								
INV								
CAP		2						
DES								
IMP		11		5				
IRA	4(4)	6(8)						
RC		11		5				
Cumulative Response Complete		69%		100%				

PUGET SOUND NAVAL STATION
PUGET SOUND, WASHINGTON

Engineering Field Division/Activity: EFANW

Major Claimant: CINCPACFLT

Size: 151 Acres

Funding to Date: $1,459,000

Estimated Funding to Complete: $0

Base Mission: Maintains and operates facilities and provides services and materials support for Navy operations forces and tenant shore activities

Contaminants: PCBs, pesticides, volatile and semi-volatile organic compounds

Number of Sites:

CERCLA:	9
RCRA Corrective Action:	0
RCRA UST:	3
Total Sites:	12

Relative Risk Ranking of Sites:

High:	1	Not Evaluated:	0
Medium:	0	Response Complete:	11
Low:	0	Total Sites:	12

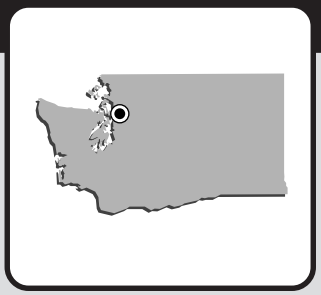
BRAC II

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	7							
SI	9							
RI/FS				1				
RD					1			
RA							1	
IRA			1(2)					
RC	8						1	
Cumulative Response Complete	89%						100%	

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC								
INV	3							
CAP								
DES	3							
IMP	3							
IRA								
RC	3							
Cumulative Response Complete	100%							

PUGET SOUND NAVAL STATION EVERETT
EVERETT, WASHINGTON



Engineering Field Division/Activity: EFANW

Major Claimant: CINCPACFLT

Size: 116 Acres

Funding to Date: $981,000

Estimated Funding to Complete: $4,981,000

Base Mission: Services a seven-ship carrier battle group

Contaminants: POLs, heavy metals

Number of Sites:

CERCLA:	1
RCRA Corrective Action:	0
RCRA UST:	0
Total Sites:	1

Relative Risk Ranking of Sites:

High:	1	Not Evaluated:	0
Medium:	0	Response Complete:	0
Low:	0	Total Sites:	1

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	1							
SI	1							
RI/FS								
RD								
RA							1	
IRA								
RC							1	
Cumulative Response Complete							100%	

Tacoma Naval and Marine Corps Reserve Center
Tacoma, Washington

Engineering Field Division/Activity: EFANW

Major Claimant: COMNAVRESFOR

Size: 14 Acres

Funding to Date: $251,000

Estimated Funding to Complete: $0

Base Mission: Educates, administers, trains, and mobilizes Naval Reservists

Contaminants: POLs

Number of Sites:

CERCLA:	0
RCRA Corrective Action:	0
RCRA UST:	1
Total Sites:	1

Relative Risk Ranking of Sites:

High:	0	Not Evaluated:	1
Medium:	0	Response Complete:	0
Low:	0	Total Sites:	1

PROGRESS AND PLANS

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC								
INV								
CAP								
DES								
IMP								1
IRA	1(1)							
RC								1
Cumulative Response Complete								100%

WHIDBEY ISLAND NAVAL AIR STATION
OAK HARBOR, WASHINGTON

Engineering Field Division/Activity:	EFANW
Major Claimant:	CINCPACFLT
Size:	7,000 Acres
Funding to Date:	$49,939,000
Estimated Funding to Complete:	$31,168,000
Base Mission:	Serves as training and operations center for the A-6 and A-6E Bomber Squadrons; serves as center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest
Contaminants:	Chlorinated solvents, PCBs, polynuclear aromatic hydrocarbons

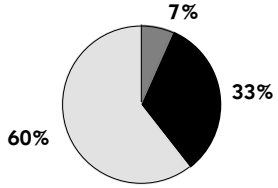
Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	51	**High:**	14	**Not Evaluated:**	16
RCRA Corrective Action:	0	**Medium:**	4	**Response Complete:**	54
RCRA UST:	38	**Low:**	1	**Total Sites:**	89
Total Sites:	89				

NPL

EXECUTIVE SUMMARY

Naval Air Station (NAS) Whidbey Island is located north of Oak Harbor in Island County, Washington. NAS Whidbey occupies four separate areas on Whidbey Island: the Ault Field north of Oak Harbor; the Seaplane Base east of Oak Harbor; the Outlying Field near Coupeville; and the Lake Hancock Target Range. Whidbey Island NAS serves as training and operations center for the A-6 and A-6 E bomber squadrons and as a center for U.S. Navy and Marine Corps reserve training in the Pacific Northwest. Past disposal practices have resulted in contamination at several sites, including six former landfill areas. Other operations that contributed to contaminated sites on the base include aircraft maintenance, vehicle maintenance, public work shops and fire fighting training. Contaminants were found in groundwater, surface water, sediments, and soil. In February 1990, Ault Field and the Seaplane Base were put on the National Priorities List (NPL) due to the number of waste disposal and spill sites. There was also the potential for wastes originating from Ault field and the Seaplane Base to affect domestic drinking water wells and local shellfish beds. The Federal Facilities Agreement among the Navy, EPA, and the State of Washington Department of Ecology was signed in September 1990. It required the Navy to further investigate Ault Field and the Seaplane Base and evaluate methods for cleanup. Soil excavation activities at the Seaplane Base have sufficiently reduced the threat to human and health and the environment. The EPA removed the Seaplane Base from the National Priorities List on 21 September 1995. The State of Washington removed the Seaplane Base from their Hazardous Sites List on 22 August 1995. This was the first such delisting for the Navy.

Surface runoff from NAS Whidbey Island discharges directly into the Straits of Juan de Fuca, Dugualla Bay at Ault Field, and into Crescent Harbor and Oak Harbor at the Seaplane Base. The beaches and bays around the island are popular fishing and shellfish gathering areas. A drinking water aquifer for the island underlies the installation and is the primary and sole source of water for most of rural Whidbey Island.



Current Status Of Sites

Studies Underway	6
Cleanups Underway	29
Response Complete	54
TOTALS	89

The Community Relations Plan (CRP) was finalized in FY91 and revised in FY95. The Technical Review Committee (TRC) was converted to a Restoration Advisory Board (RAB) in FY94. This was one of the first five RABs within the Navy and Marine Corps. Comments have been solicited from the community at an Open House. Information Repositories have been established at three local libraries.

At the end of FY95, six of the 89 sites were in the study phase, 29 were in the cleanup phase, and 54 were Response Complete (RC). A Hazardous Waste Evaluation Study (HWES) performed in 1994, recommended 17 sites for No Further Action (NFA). Two removal actions were completed in FY91 at Site 43 to remove tanks and petroleum-contaminated soil. In FY94, a tank was removed at Site 11 and contaminated soil was removed at Site 37. Corrective Actions were completed for 16 UST sites. Various USTs were removed from Whidbey Island in FY95. Remedial Action (RA) will begin in FY96 for USTs 42 and 95. In FY95, groundwater contamination from a former landfill at Site 6 of OU 1 was migrating off-base and threatening private landowners' wells. A pump and treat system was installed and began full scale operations. Residents have been connected to public water supplies and their wells have been closed. The landfill is currently being capped and anticipated to be completed in FY96. The Pump and treat will continue to operate. Also in FY95, at OU 3, a ROD was signed, and the system Remedial Design (RD) completed. Removal of sediments contaminated with petroleum products, inorganics, and organic compounds will be completed in FY96. At OU 2, soils contaminated with the chemical additive PCB, organic compounds and pesticides were removed. During the RAs at OUs 2 and 3, contaminated non-hazardous soil was disposed of at the Site 6 landfill, prior to the construction of the landfill cap there. This saved the Navy considerable costs over disposal at an off-site location.

In FY96, OU 5 will have a ROD signed, and RD will begin. The RD will be completed in FY97. The Navy has used various innovative concepts on OU 5. They include a qualitative (vs. quantitative) risk assessment, a focused Feasibility Study (FS) a combined RI/FS document, and a Reader's guide to the RI/FS document for the RAB and the community. All four of these innovative concepts expedited the cleanup process in FY95 by streamlining the Navy's efforts and facilitating an efficient RAB review of the RI/FS.

NAS Whidbey Island was recognized for its outstanding environmental cleanup program through the Secretary of Defense (SECDEF) Environmental Cleanup Award. This award represents a major accomplishment and environmental success for NAS Whidbey Island.

WHIDBEY ISLAND NAS
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - Surface runoff from NAS Whidbey Island discharges directly into the Straits of Juan de Fuca, Dugualla Bay at Ault Field, and into Crescent Harbor and Oak Harbor at the Seaplane Base. An important drinking water aquifer for the island underlies the installation. This aquifer is the primary and sole source of water for most of rural Whidbey Island. Groundwater contamination from a former Navy landfill at Site 6 (OU 1) was migrating off-base and threatening the drinking waterwells of private landowners. An Interim Remedial Action (IRA) addressed the primary risk posed to the public from groundwater contamination by controlling the spread of the contaminated plume of groundwater. The major components of the IRA included extracting groundwater to minimize the plume; treating extracted groundwater using metal precipitation and air stripping; reinjecting treated groundwater into the aquifer from which it was drawn; and monitoring groundwater to measure the effectiveness of the remedy. During pump and treat, residents were connected to public water supplies and their wells were closed. The IRA was completed in January 1994.

NATURAL RESOURCES - The beaches and bays around Whidbey Island are popular fishing and shellfish gathering areas. The bald eagle, a threatened species, and the peregrine falcon, an endangered species, may occasionally hunt at NAS Whidbey Island.

RISK - Fourteen sites at NAS Whidbey Island have been ranked high relative risk. Discussion follows on what has been done at seven of these high risk sites. Three high risk sites are old landfills. Two of the landfills, Sites 5 and 6, are contributing to groundwater contamination which is migrating from beneath the landfills to off-site residences. Site 6 had three million gallons of liquid wastes deposited at the site. A cap is being placed on the landfill to prevent rainwater from infiltrating through the landfill and into the groundwater with additional contaminants. The capping should be completed in FY96. The Pump and treat system became operational in June 1995.

OU 2 contains three high risk sites: Sites 4, 14 and 29. Site 4 is a former transformer storage area. Contaminated surface soils were threatening nearby wetlands, recreational areas and residential wells. Site 14 was a former pesticide disposal area. Contaminated groundwater at this site could have spread and threaten the sole source aquifer. Site 29 is a former fire training school. Contaminated soils and groundwater posed an ecological risk to humans and small mammals. In FY95, Remedial Action (RA) was completed at OU 2 and soils contaminated with PCBs, organic compounds and pesticides were removed.

OU 3 contains two high risk sites: Sites 16 and 31. Site 16 includes runway ditches. Contaminated soils and groundwater posed an ecological risk to humans and marine life. Site 31 is a former fire training area. Possible exposure pathways include contaminated surface and subsurface soil, and contaminated groundwater. Receptors include humans and small mammals. Remedial Action is underway to remove sediments contaminated with petroleum products, inorganics and organic compounds by dredging 7,000 linear feet of runway ditches.

RESTORATION PROJECTS - An RA provided an additional wildlife area at OU 4 by creating a pond. Removal of backfill material was done intentionally to create a pit with gradually sloping sides in order to form a pond at the borrow area.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - In February 1990, NAS Whidbey Island was listed on the National Priorities List (NPL) with Hazard Ranking System scores of 39.64 for Seaplane Base and 48.48 for Ault Field. Placement on the NPL was due to the number of waste disposal and spill sites discovered. Contaminants at these sites included large quantities of petroleum products, solvents, paints, thinners, jet fuel, pesticides, and other wastes. There was also the potential for wastes originating from Ault field and the Seaplane Base to affect domestic drinking water wells and local shellfish beds.

Soil excavation activities at the Seaplane Base have sufficiently reduced the threat to human and health and the environment. The EPA removed the Seaplane Base from the National Priorities List on 21 September 1995. The State of Washington removed the Seaplane Base from their Hazardous Sites List on 22 August 1995. This was the first such delisting for the Navy.

LEGAL AGREEMENTS - In September 1990, the Navy signed a Federal Facility Agreement (FFA) for Ault Field and the Seaplane Base. Individual sites within the two areas were grouped into Operable Units (OUs) to facilitate cleanup efforts.

OU 1 - Sites 5 and 6
OU 2 - Sites 2, 3, 4, 14 and 29
OU 3 - Sites 16 and 31*
OU 4 - Sites 39, 41, 44, 48 and 49.
* Site 31 was recently moved to OU 5.

The FFA specified that 26 sites undergo more intensive sampling programs, such as a Hazardous Waste Evaluation Study (HWES) for potential inclusion in an RI/FS. The HWES was completed. Sites 1 and 52 were recommended for an RI/FS as OU 5 due to soil and groundwater contamination. Sites 7-10, 19, 22-25, 27, 28, 32, 34, 40 and 53 were recommended for No further Action (NFA). The other sites included in the HWES will undergo removal actions followed by confirmatory sampling.

PARTNERING - To improve working relationships and expedite the cleanup program, the Navy includes regulators and contractors in scoping meetings. The decision-making process has improved by providing technical information to the regulators prior to the submission of primary deliverables. Prior to beginning the RI/FS for OU 5, the Navy conducted extensive scoping discussions with the EPA and the State of Washington. Working together, an investigation and remediation strategy was developed. Consequently there were minimal regulator comments on the RI/FS work plan, and the Navy was able to quickly complete the field sampling and the RI/FS document. The ROD for Operable Unit (OU) 3 was signed in April 1995 and the cleanup of OU 3 was also completed during FY95. Mutual trust between the Navy and the EPA helped expedite the cleanup process and saved significant environmental dollars.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - The Technical Review Committee (TRC) was formed in 1988 and met quarterly. The TRC was converted to a Restoration Advisory Board (RAB) in FY94. This was one of the first five RABs within the Navy and Marine Corps. The twenty-five RAB members meet bi-monthly and have reviewed numerous technical documents. The Navy prepared a Reader's Guide for the OU 5 RI/FS document. The Reader's Guide is an expanded executive summary which provides a technical synopsis of the RI/FS and includes figures and data tables. The Reader's Guide was well received by the RAB and the community.

COMMUNITY RELATIONS PLAN - The Community Relations Plan (CRP) was finalized in February 1991 and revised in FY95. A RAB brainstorming session was conducted to develop the list of community members to be interviewed as well as the interview questions. The Navy interviewed community members individually, and the entire community was invited to an open house to learn about the cleanup program and provide comments on the CRP update.

INFORMATION REPOSITORY - The Administrative Record is maintained at EFA Northwest, Poulsbo, Washington. Information Repositories have been established at the Oak Harbor Library, Oak Harbor Washington, at the Coupeville Library in Coupeville, Washington, and at the NAS Whidbey Library, Oak Harbor Washington.

WHIDBEY ISLAND NAS
HISTORICAL PROGRESS

FY84

An Initial Assessment Study (equivalent to a PA) identified 52 past spill and/or disposal sites. 34 sites were recommended for further study or mitigating actions and potentially involve soil, groundwater, sediment, and shellfish contamination.
Sites 1, 7-12, 15, 30, 33, 34 and 46-51 - Recommended for No Further Action (NFA) based on lack of information concerning migration or exposure pathways and contaminant concentrations.
Site 52 - Described in the IAS but not identified as a site until later.

FY88

Sites 2-6, 13-14, 16-29, 31-32 and 35-45 - A Current Situation Report (CSR) (equivalent to an SI) was completed. Sites 2 and 3 had groundwater contamination and discoloration of a few water samples. Site 4 had low levels of PCBs found in the soil. Oily seeps were found downgradient of Site 5. At Site 6, elevated levels of iron and chromium were found, and specific conductivity suggesting potential downgradient groundwater contamination. The CSR found no detectable pesticide or herbicide contamination of soil or groundwater at Site 14, although inhibited vegetation growth was observed in this area. At Site 16, significant concentrations of petroleum hydrocarbons, trace metals, and polynuclear aromatic hydrocarbons (PAHs) were found in soil and groundwater. At Site 29, significant concentrations of lead, organic halogens, and PAHs were found in soil. At Site 31, the CSR found surface soil contaminated with lead, organic halogens, PCBs, and PAHs. The Ault Field Sites were found to have groundwater contaminated with petroleum hydrocarbons, organic carbon, and organic halogens. Sites 35-45 had slightly elevated levels of trace metals detected in sediment and shellfish. All sites except for Sites 32 and 38 were recommended for an RI/FS. Sites 32 and 38 were recommended for no further action.
Sites 21, 26, 37 and 42-43 - These sites were moved to the UST Program.

FY90

Sites 12, 21, 26, 30, 33, 37, 38, 42-43, 46-47 and 50-51 - No further action recommended, although Site 42 did have further study.

FY91

Site 43 - Two removal actions were completed to remove tanks and petroleum contaminated soil.
Sites 12, 113 and 138 - Interim Removal Actions were completed.
USTs 12, 117, 212 and 420 - The Remedial Investigation was completed.

FY92

An FFA required additional sampling. Extended SIs were completed.
OU 1 - In April 1992, the Department of the Navy signed an Interim Record of Decision (IROD) with EPA Region X and the State of Washington for an Interim Remedial Action (IRA).
Site 42 - The Remedial Investigation was completed.
Sites 420 and 212 - The Remedial Action was completed.

FY93

OU 1 - The RI/FS was completed. The final RI/FS recommended capping of the landfill.
OU 2 - An RI/FS was completed. The final RI/FS recommended removal and off-site disposal of soils containing PCBs, pesticides and PAHs.
OU 4 - An RI/FS was completed. Small scale removals and off-site disposal of contaminated soils were recommended.

FY94

Site 11 - A removal action was completed to remove a tank.
Site 37 - A removal action was completed to remove contaminated soil.
Site 16 of OU 3 - An RI/FS was completed.
OUs 1, 2 and 4 - RD was completed.
USTs 53 and 60 - Remedial Investigation was completed.
USTs 12, 121, 116, 60, 53, 977, 137, 214, 313, 386, 415, 500, 510, 599, 889 and 2708 - Remedial Action was completed.
Site 42 - A Corrective Action Plan was completed.

PROGRESS DURING FISCAL YEAR 1995

FY95

Various USTs were removed around Whidbey NAS.
Site 6 of OU 1 - Groundwater contamination from a former Navy landfill was migrating off-base and threatening private landowners. A pump and treat system was installed and began full scale operations. During pump and treat, residents were connected to public water supplies and their wells were closed. The landfill is currently being capped.
Site 16 of OU 3 - A ROD was signed in April 1995 and Remedial Design (RD) completed. A Remedial Action (RA) is underway to remove sediments contaminated with organic compounds, inorganics, and PAHs, by dredging 7,000 linear feet of runway ditches. Additional cleanup actions include: testing the dredged sediments and comparing the test results to federal and state regulations to determine if the sediments are hazardous; disposing of non-hazardous sediments in the base landfill; and treating and disposing of hazardous sediments off-base as required by state and federal regulations.
OU 2 - Remedial Action was completed and soils contaminated with PCB,organic compounds and pesticides were removed.
OU 4 - The final Remedial Action was completed on soils contaminated with arsenic, chromium, lead, organic compounds and pesticides. An on-site borrow soil area provided a backfill material source. Analysis of a composite sample from the borrow soil area confirmed that the soil was free of contamination. Removal of backfill material was done intentionally to create a pit with gradually sloping sides in order to form a pond. Thus, the remedial action program provided an additional wildlife area by creating a pond at the borrow area.
Sites 39, 41, 44 and 48-49 of OU 4 - The Seaplane Base was delisted from the National Priority List (NPL) and the State of Washington's Hazardous Sites List.
Sites 1, 31, and 52 of OU 5 - An RI/FS was completed.

PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Site 6 - The landfill cap is anticipated to be completed in September 1996. Also at Site 6, the RA to pump and treat groundwater will continue to operate in FY96.
OU 3 - Will have RA completed.
Sites 1, 31 and 52 of OU 5 - Will have a ROD signed, and RD will begin in FY96. The RD at Sites 1 and 52 will be completed in FY97.
USTs 42 and 95 - RA is scheduled to begin.

FY97

Sites 1, 31 and 52 of OU 5 - RD should be completed and RA will begin.

WHIDBEY ISLAND NAS
PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	50							
SI	43							
RI/FS		29	1	10				
RD	4		1	1				
RA		7	10	2		2		2
IRA		1(1)		2(2)				
RC	8	23	9	1		1	1	8
Cumulative Response Complete	16%	61%	78%	80%		82%	84%	100%
UST	**FY94 and before**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**	**FY00**	**FY01 and after**
ISC	2							
INV	9							
CAP	1							
DES								
IMP	23	9	1	1				
IRA	15(15)	1(1)						
RC	21	2	1	1				13
Cumulative Response Complete	55%	61%	63%	66%				100%