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Letter of Transmittal

To: Engineering Field Activity, Northwest
Naval Facilities Engineering Command
3505 NW Anderson Hill Road
Silverdale, Washington 98383

Date: 12/20/91

Job No. J-2830

Attn: Bela Varga

Re:

We are sending the following items:

Date	Copies	Description
12/20/91	1	Final ROD for Site A, SUBASE, Bangor

These are transmitted:

☐ For your information ☐ For action specified below ☐ For review and comment ☐ For your use ☒ As requested

Remarks

By: Kristin M. Miller
Kristin M. Miller

Copies to:

Title: Project Assistant

DECLARATION OF
THE RECORD OF DECISION

SITE NAME AND LOCATION

Naval Submarine Base, Bangor Site A (Operable Unit 1)
Bangor, Washington.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Site A (Operable Unit 1) at the Naval Submarine Base (SUBASE), Bangor in Bangor, Washington, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the administrative record for the site.

The lead agency for this decision is the U.S. Navy. The U.S. Environmental Protection Agency (EPA) approves of this decision and, along with the State of Washington Department of Ecology (Ecology), has participated in the scoping of the site investigations and in the evaluation of remedial action alternatives. The State of Washington concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF SELECTED REMEDY

The selected remedy is the only response action planned for Site A. This action addresses contaminated soil and contaminated groundwater. The selected remedy will consist of the following actions:

Soil Remediation:

- Excavate approximately 7,000 cubic yards of surface soil from the Burn Area of Site A containing ordnance concentrations above state cleanup levels for potential direct soil contact exposures.

- Excavate approximately 100 cubic yards of surface soil from Debris Area 2 of Site A containing ordnance and/or lead concentrations above state cleanup levels for potential direct soil contact exposures.

- Place all excavated soils within a lined soil washing basin constructed within the Burn Area. Debris Area 2 soils with elevated lead concentrations will be isolated in a special cell within the washing basin. The excavated soils will be modified as necessary by mechanical or chemical means to ensure that the subsequent treatment (washing) process will be effective and efficient.

- Dissolve ordnance contaminants from the excavated soils using a Soil Washing system, and treat the leachate with Ultraviolet (UV)/Oxidation technologies to permanently destroy the ordnance contaminants. Treated leachate will be recirculated to the treatment basin, establishing a closed treatment system (i.e., no discharge).

- Monitor the effectiveness of the soil washing and treatment processes. Soil washing will continue until state ordnance cleanup levels for potential direct soil contact exposures are achieved, and leachate concentrations are below state groundwater protection (drinking water use) levels.

- After soil (ordnance) treatment, remove soils originally excavated from Debris Area 2 containing lead concentrations above state cleanup levels for potential direct soil contact exposures. These soils (approximately 100 cubic yards) will be disposed at a permitted off-site landfill. All other soils will remain on site.

- Following completion of the soil treatment action, groundwater protection will be assessed by monitoring ordnance concentrations in the seasonal Perched Groundwater Zone immediately underlying the Burn Area. The point of compliance for comparison with state groundwater protection (drinking water use) levels will be established throughout the Perched Zone. If compliance with state groundwater protection criteria has not been achieved within five years from commencement of this action, modifications to the groundwater remediation system will be considered, as discussed below.

Groundwater Remediation:

- Using approximately eight extraction wells, remove groundwater within the Shallow Aquifer (below the Perched Zone) containing ordnance concentrations above state groundwater cleanup levels (drinking water use).

- Treat the extracted groundwater using a UV/Oxidation process to permanently destroy the ordnance contaminants and achieve state groundwater discharge standards prior to disposal.

- Dispose of the treated groundwater on base (at the Burn Area) by reintroduction into the Shallow Aquifer.

- Monitor the effectiveness of the groundwater extraction and treatment processes throughout the restoration action, which may extend for a period of up to 10 years. The system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation.

DECLARATION

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Because this remedy may result in hazardous substances remaining on-site above health-based levels after a period of five years, a periodic review will be conducted in accordance with the existing Federal Facility Agreement for SUBASE, Bangor to ensure that the remedy continues to provide adequate protection of human health and the environment.

Lawrence Kramer 6 Dec 1991

Captain Lawrence Kramer
SUBASE, Bangor Commanding Officer
United States Navy

Date

Signature sheet for the foregoing SUBASE, Bangor - Site A, Remedial Action, Record of Decision between the United States Navy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Dana Rasmussen — 12/10/91

Dana Rasmussen
Regional Administrator, Region 10
United States Environmental Protection Agency

Date

Signature sheet for the foregoing SUBASE, Bangor - Site A, Remedial Action, Record of Decision between the United States Navy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Carol L. Fleskes — 12/10/91

Carol Fleskes, Program Manager — Date
Toxics Clean-up Program
Washington State Department of Ecology

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DECISION SUMMARY

1.0 INTRODUCTION

Under the Defense Environmental Restoration Program, it is the U.S. Navy's policy to address contamination at Navy installations in a manner consistent with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). In the case of Ordnance Disposal Site A at U.S. Naval Submarine Base (SUBASE), Bangor, remedial action will be implemented to minimize potential health risks associated with soil and groundwater contamination. The remedial action will also comply with applicable or relevant and appropriate requirements (ARARs) promulgated by the State of Washington and the U.S. Environmental Protection Agency (EPA).

2.0 SITE NAME, LOCATION, AND DESCRIPTION

SUBASE, Bangor is located in Kitsap County, Washington, on Hood Canal approximately 10 miles north of Bremerton. The Bangor Ordnance Disposal Site A is located in the northern portion of SUBASE, Bangor, approximately 2,000 feet southeast of Hood Canal (Figure 1 at end of text). Land surrounding SUBASE, Bangor is generally undeveloped or supports limited residential use. The residential community of Vinland is located approximately 2,000 feet north of Site A. The base and site are currently fenced, and access to the site is limited to authorized personnel only.

Site A is composed of four separate upland areas totaling approximately 12 acres. The size of individual areas ranges from less than one acre to approximately 6 acres, and all are presently surrounded by forest. Ground elevation in the site vicinity generally ranges from 150 to 180 feet above mean sea level.

Surface water runoff from the site is directed northerly (towards Vinland) and westerly (toward Cattail Lake), with eventual discharge into Hood Canal (Figure 2). Several residences in Vinland obtain water supply from a (Class II per EPA classification) Shallow Aquifer, located approximately 60 to 100 feet below ground surface. However, municipal water supplies in Vinland are obtained from the deeper, regionally extensive Sea Level Aquifer, which is separated from the Shallow Aquifer by approximately 140 feet of low permeability soils.

Site A is composed of a Burn Area, two Debris Areas, and a Stormwater Discharge Area (Figure 2). The Burn Area, which at 6 acres is the largest individual area of the site, was used to detonate and incinerate various ordnance materials, including trinitrotoluene (TNT), flares, fuses, primers, smoke pots, smokeless powder, and black powder. Inert solid waste material (e.g., metal casings) resulting from the Burn Area operations was deposited

at the two adjacent Debris Areas. The Stormwater Discharge Area has received surface water runoff from the Burn Area since a diversion structure was completed in 1983. As a result of these activities, soil, surface water, and groundwater within various areas of Site A have received different types and quantities of releases of ordnance compounds, their breakdown products, and metals.

3.0 SITE HISTORY AND ENFORCEMENT ACTIONS

The Burn Area of Site A was used to detonate and incinerate various ordnance materials beginning in 1962 and continuing to 1975. The site originally consisted of 24 burn mounds and support facilities for personnel, fire equipment, and trucks. An incinerator for small arms ammunition and dangerous pyrotechnic items was added between 1965 and 1970, along with a shielded blast pit used for detonation of TNT. Figure 3 shows the historical features at the site.

Demilitarization wastewater lagoon sediments containing ordnance residuals were periodically excavated from Site F (Operable Unit 2 at SUBASE, Bangor) and transported to Site A for burning and disposal. Site F sediments were received at the site through February 1972, when 20 cubic yards of soils were excavated from the top several feet of the former Site F lagoon area and delivered to Site A for burning.

Most detonation and incineration activities at Site A ceased by 1975. Operations buildings were demolished and burned at the site in 1977. However, grading and redistribution of soils at the Burn Area continued through 1984. Limited testing of various ordnance materials was conducted two or three times a year until 1986, when all such activities ceased at Site A.

In 1978, the Navy began an Assessment and Control of Installation Pollutants (ACIP) program to evaluate waste disposal sites at SUBASE, Bangor, including Site A. The investigation was summarized in 1981 as part of an Initial Assessment Study (IAS). Based on the results of the ACIP/IAS investigations, in 1983 the Navy diverted surface water discharges from the Burn Area to minimize contaminant releases to Vinland. Since that time, runoff has been diverted to the Stormwater Discharge Area, with eventual discharge into Hood Canal (Figure 2).

Investigations at Site A continued in 1986 as part of a Characterization Study under the Navy Assessment and Control of Installation Pollutants (NACIP) program. In that year, Congress enacted the Superfund Amendments and Reauthorization Act (SARA) which required federal facilities to comply with the EPA's procedures at inactive waste sites.

On July 22, 1987, the EPA listed Bangor Ordnance Disposal Site A on the National Priorities List (NPL) of Hazardous Waste Sites. As a result, the Navy suspended further

NACIP program activities and phased into the EPA Remedial Investigation/Feasibility Study (RI/FS) program.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Community Relations Plan for Site A is presented in the Management Plan for the site, available for review in the information repositories. Community relations activities have established communication between the citizens living near the site, the Navy, and EPA. Discussion between the different groups for information purposes and suggestions on the project has been open. The actions taken to satisfy the requirements of the federal law have also provided a forum for citizen involvement and input to the remedial action decision.

The community relations activities at the site included the following:

- Technical Review Committee (TRC) meetings with representatives from surrounding communities;
- Issuance of three fact sheets for the Site A RI/FS, which provided updates on the work being performed and major findings; and
- Coordination with other citizens groups formed in response to site investigations of concern to the community.

The specific requirements for public participation pursuant to CERCLA Sections 113(k)(2)(b) and 117(a) include releasing the Proposed Plan to the public. This was done in August 1991. The Proposed Plan was placed in the administrative record and information repositories. Attachment B presents the Administrative Record Index.

The information repositories are located at Kitsap regional libraries:

Bangor Branch (206) 779-9724
Naval Submarine Base, Bangor
Silverdale, Washington 98315-5000

Main Branch (206) 377-7601
1301 Sylvan Way
Bremerton, Washington 98310

The Administrative Record is on file at:

Engineering Field Activity, Northwest
Naval Facilities Engineering Command
3505 N.W. Anderson Hill Road
Silverdale, Washington 98383-9130
(206) 476-5775

Notice of the availability of the proposed plan, plus notice of a public meeting on the proposed plan and public comment period was published in the Silverdale Reporter (August 14, 1991), Bremerton Sun (August 14, 1991), North Kitsap Herald (August 14, 1991), and Trident Times (August 16, 1991). A public comment period was held from August 14, 1991 to September 12, 1991. A public meeting was held on August 21, 1991, with presentations given by the Navy, EPA, and the Washington State Department of Ecology (Ecology). A total of 37 people attended the public meeting.

Eight comments (total) were received by the Navy concerning the Proposed Plan. All comments were submitted and discussed at the public meeting. The public comments are summarized and responses presented in the Responsiveness Summary (Attachment A) portion of this document.

5.0 SCOPE AND ROLE OF OPERABLE UNITS

Two NPL sites occur at SUBASE, Bangor. The first is Bangor Ordnance Disposal Site A (Operable Unit 1), which was listed on the NPL on July 22, 1987. This Record of Decision addresses all of Operable Unit 1. On August 30, 1990, the remainder of SUBASE, Bangor was listed on the NPL, including an additional six operable units comprising 20 known or suspected hazardous waste sites. Site A is geographically separate from the other operable units that comprise the second Bangor NPL Site.

The selected Remedial Action at Site A is a measure to minimize potential future health risks associated with soil and groundwater contamination at the site. This action includes soil treatment to address risks posed by direct contact exposures at the site. Soil treatment will also address further releases of contaminants to surface water and groundwater. The selected groundwater action includes extraction of contaminated groundwater present in the Shallow Aquifer underlying Site A, treatment of the extracted waters to required cleanup levels, and reintroduction of the treated waters back into the aquifer system. The groundwater restoration action addresses principal and low-level risks posed by potential future water supply use of site groundwaters.

6.0 SUMMARY OF SITE CHARACTERISTICS

This section presents a summary of site conditions including the nature and extent of chemical contaminants. Migration pathways and transport characteristics of site contaminants are also discussed. A summary of baseline site risks is presented in the following Section 7.0.

The site characterization summarized in this section was based on the combined results of sampling performed over the period 1978 to 1990, as summarized in the RI/FS report. However, only the more recent 1987 to 1990 validated data were used in the assessment of site risks (summarized in Section 7.0).

6.1 Soil Contaminants

Soil quality data were collected at Site A during two principal sampling periods. The first occurred over the period 1978 to 1982, and was conducted by SUBASE, Bangor under the ACIP program. The second sampling was conducted by Hart Crowser in 1988 as part of the RI/FS. The constituents analyzed during the earlier Navy soil samplings were largely limited to TNT and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), which were the primary ("parent") components of the ordnance materials handled at the site. The more recent Hart Crowser samplings included the determination of priority pollutant metals, semivolatile organics, pesticides, and polychlorinated biphenyls (PCBs), along with a wider range of ordnance compounds and their degradation products.

Consistent with the prior detonation and incineration activities, data collected during the RI/FS revealed the presence of ordnance compounds and associated chemicals including TNT, RDX, 2,4- and 2,6-dinitrotoluene (DNT), 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, nitrobenzene, picric acid, picramic acid, Otto fuel, and tetryl. Administration of these ordnance compounds in animal bioassays has been shown to result in effects to the liver, prostate, and spleen. Animal studies also indicate that DNT is a probable human carcinogen. Based on limited animal data, TNT and RDX are considered possible human carcinogens.

The maximum total ordnance concentration in soil (primarily represented by TNT) was approximately 0.2 percent by dry weight (2,000 milligrams per kilogram; mg/kg), detected in a sample collected from a former burn mound. The ordnance concentrations encountered are not considered an explosive or fire hazard. Soils at Site A also do not exceed designation criteria for characteristic dangerous or hazardous wastes, and are not listed hazardous wastes.

The distribution of TNT in surface soils at the Burn Area is depicted on Figure 4. The highest concentrations of ordnance at Site A (e.g., TNT at 1,300 mg/kg) have been detected on some of the former burn mounds and in the vicinity of the former Burn Area

blast pits (Table 1). Similar concentrations and spatial distributions of TNT and RDX were observed between the earlier (1978 to 1982) and most recent (1988) samplings.

The concentrations of ordnance in Burn Area soils are largely confined to depths within 1 to 3 feet of ground surface. The concentrations of most ordnance compounds, particularly TNT, decline approximately 100-fold over the top 3 feet of soil. TNT has not been detected (at the 0.1 mg/kg detection limit) in soils collected below a depth of 3 feet. TNT has also not been detected in site groundwaters (see Section 6.3). Approximately 7,000 cubic yards of soil at the Burn Area contain TNT concentrations above 30 mg/kg, the risk-based soil cleanup level (see Section 8.0).

RDX was detected along with TNT in surface soil samples collected from the Burn Area. However, unlike TNT, low-level concentrations of RDX have migrated further through the underlying soil. RDX has been detected in Shallow Aquifer water samples collected approximately 70 to 80 feet below ground surface (see Section 6.3 below). Soil concentrations of RDX below a depth of 30 feet were less than the 0.1 mg/kg detection limit. Compared with TNT and the other ordnance compounds detected at Site A, RDX is relatively soluble in water and is readily transported with groundwater flows. Sorption of RDX onto soils results in only minimal retardation of the movement of this chemical. Subsurface transport of RDX is discussed in more detail in Section 6.3.

Other (non-ordnance) chemicals detected in soils of the Burn Area included metals (chromium, copper, lead, nickel, and zinc), di-n-butylphthalate, and PCBs. The detected levels of these chemicals were typically lower than soil ordnance concentrations, and were also below soil cleanup levels established under the Washington State Model Toxics Control Act (MTCA; Chapter 173-340 WAC; see Section 8.0 below). Maximum concentrations of lead, di-n-butylphthalate, and PCBs were approximately 80 mg/kg, 3 mg/kg, and 0.1 mg/kg, respectively (Table 1). Detection limits for these chemicals were 10 mg/kg, 1 mg/kg, and 0.1 mg/kg, respectively.

Similar to conditions in the Burn Area, surface soils from the upper regions of Debris Area 2 contained detectable concentrations of ordnance compounds (particularly TNT, with a maximum concentration of 72 mg/kg; Table 1). However, soils collected from Debris Area 2 exhibited higher concentrations of metals (barium, cadmium, chromium, copper, lead, and zinc) and several organic compounds including bis[2-ethylhexyl]phthalate, di-n-butylphthalate, and PCBs. The most prevalent metal was lead, which was detected in surface soils of Debris Area 2 at a maximum concentration of 2,400 mg/kg. Lead exposure has been associated with blood and neurobehavioral effects in children and is also a probable human carcinogen. The maximum total phthalate and PCB concentrations detected at Debris Area 2 were approximately 1 mg/kg and 4 mg/kg, respectively. Bis(2-ethylhexyl)phthalate and PCBs are considered probable human carcinogens.

Because of its small size, a relatively limited quantity of contaminated soils is present at Debris Area 2. An estimated 100 cubic yards of soil in this area contains chemical concentrations (primarily TNT and lead) which exceed MTCA soil cleanup levels. This estimated volume is less than two percent of the similarly contaminated soil volume in the Burn Area.

Little contamination of soils in Debris Area 1 and in the Stormwater Discharge Area has occurred. No ordnance compounds were detected in soil samples collected from these areas. A summary of soil contaminant concentrations at Site A is presented in Table 1.

6.2 Surface Water, Sediment, and Tissue Contaminants

During periods of relatively intense rainfall, stormwater runoff is discharged from the Site A Burn Area up to a maximum measured flow of approximately 1 cubic foot per second. Water samples collected during these ephemeral peak flow periods contained the highest number and concentrations of ordnance compounds relative to all other surface waters sampled at Site A. During the 1987 to 1989 RI/FS sampling period, the chemicals detected in Burn Area stormwater included TNT (to 140 micrograms per liter; μg/L), RDX (to 39 μg/L), DNT (to 0.3 μg/L), and several other ordnance chemicals present at the limits of detection (roughly 0.1 μg/L). Lead, di-n-butylphthalate, and PCBs were not detected in runoff from the Burn Area.

Surface runoff from the Burn Area was diverted in 1983 from Vinland Creek to the Stormwater Discharge Area where runoff infiltrates into a shallow interflow zone through permeable surface soils. This water emerges as seeps from the base of the Stormwater Discharge Area near the beaches of Hood Canal (Figure 2). Seepage waters contained RDX at an average concentration of 5 μg/L (maximum 17 μg/L). Average concentrations of TNT and DNT were substantially lower at 0.4 μg/L and less than 0.1 μg/L, respectively. Soil sorption within the Stormwater Discharge Area appears to reduce the concentrations of TNT and DNT during interflow transport. Because of its greater mobility, RDX is attenuated to a lesser extent during subsurface transport. No ordnance compounds were detected in sediment or shellfish tissue samples collected from the Hood Canal beach areas near the seepage discharge.

Surface water in Vinland Creek near the SUBASE boundary continues to exhibit low concentrations of ordnance compounds, though current concentrations are approximately 200 times lower than those measured prior to the 1983 diversion. Average concentrations of RDX, TNT, and DNT detected during the RI/FS sampling of these surface waters were 3 μg/L, 0.2 μg/L, and 0.1 μg/L, respectively. Low concentrations of DNT (to 0.02 mg/kg) were also detected in Vinland Creek sediment samples. No ordnance compounds were detected in sediment or shellfish tissue samples collected from the Hood Canal beach areas near the Vinland Creek discharge.

Cattail Lake contained low but detectable concentrations of RDX, TNT, and DNT at average concentrations of approximately 0.6 μg/L, 0.09 μg/L, and 0.03 μg/L, respectively. No ordnance compounds were detected in sediment or fish tissue samples collected from Cattail Lake.

6.3 Hydrogeology and Groundwater Contaminants

Groundwaters occur at Site A in two zones, as depicted on Figure 5. The first -- the Perched Groundwater Zone -- is a seasonal unit present at a depth of 10 to 15 feet below ground surface in the Burn Area. The Perched Groundwater Zone occurs within recessional outwash deposits of gravelly, silty sand. Concentrations of ordnance have historically been highest in waters collected from the Perched Groundwater Zone.

Some of the older monitoring wells completed in the Site A Perched Groundwater Zone appear to lack proper surface seals to prevent direct discharge of surface water into the well. For those site contaminants such as TNT which appear to be largely confined to surface media (i.e., surface soils and associated runoff), down-hole contamination of groundwater samples obtained from these older wells is possible. For this reason, the characterization of overall chemical quality in the Perched Zone was based primarily on samples collected from newer wells with competent seals.

The only ordnance compound detected in newer wells completed in the Perched Groundwater Zone is RDX. Concentrations of RDX in this zone over the 1987 to 1990 RI/FS sampling period averaged approximately 19 μg/L (range: <0.1 μg/L to 61 μg/L; Table 1). RDX concentrations in the Perched Groundwater Zone were also similar to those detected in surface water runoff (average = 20 μg/L; range: <1 to 39 μg/L). In contrast, surface water TNT concentrations (to 140 μg/L) are far greater than those of the Perched Groundwater Zone (<0.6 μg/L). In this case, even relatively small movements of surface water into the older wells would be expected to have a substantial effect on TNT concentrations within the wells. Conversely, RDX concentrations within these older wells may be relatively unaltered by such an occurrence.

If all of the RDX data collected from both newer and older wells are assumed to be representative of conditions in the Perched Groundwater Zone, a highly significant downward trend in concentrations over time is apparent. RDX concentrations in the Perched Groundwater Zone have declined from approximately 1,000 to 10,000 μg/L during the early 1980s to the recent (1987 to 1990) range of less than 0.1 μg/L to 61 μg/L. The average rate of decline of the historical concentrations is approximately 30 percent per year. For reasons discussed above, it is unlikely that the apparent lack of surface seals on many of the older wells substantially influenced the observed decline of RDX concentrations.

The observed rate of decline in RDX concentrations is also consistent with the model of contaminant transport through this zone. Primarily as a result of rainfall infiltration, groundwater is rapidly flushed through the Perched Groundwater Zone, with discharge both to local surface waters (Vinland Creek) and the underlying Shallow Aquifer (Figure 5). On average, groundwater is flushed through the Perched Groundwater Zone in less than one year. Because of its mobility, RDX transport is not substantially attenuated by soil sorption processes.

The Shallow Aquifer is located approximately 60 to 100 feet below ground surface, and is separated from the Perched Groundwater Zone by Vashon Till, as depicted on Figure 5. The till consists of a dense, gravelly, silty sand which is approximately 15 feet thick beneath the Burn Area. The till forms a low permeability veneer over the site which limits the rate of infiltration to the underlying Shallow Aquifer. Nevertheless, some of the groundwater from the Perched Groundwater Zone leaks through the Vashon Till and into the underlying Shallow Aquifer. The remainder of the Perched Groundwater Zone flow is discharged to Vinland Creek.

Unlike the Perched Groundwater Zone, groundwater flows relatively slowly through the Shallow Aquifer, requiring approximately 15 to 50 years to travel 500 feet across the Burn Area. The Shallow Aquifer is used for water supply by several residences in the adjacent community of Vinland, 2,000 feet north of the Burn Area. However, the flow direction of the Shallow Aquifer beneath the Burn Area is west to northwest toward Cattail Lake (i.e., not toward Vinland; Figure 6).

RDX was the only ordnance compound detected in the Shallow Aquifer. The highest concentrations were observed below the center of the Burn Area, where levels up to 189 μg/L were detected during the RI/FS sampling (Figure 6). During the 1987 to 1990 sampling period, measured concentrations of RDX at this location were also higher than those observed in the overlying Perched Groundwater Zone. However, during previous (historical) samplings dating back to 1980, this pattern was reversed, with higher RDX concentrations (1,000 to 10,000 μg/L) previously detected in the Perched Groundwater Zone.

The existing distribution of RDX within groundwaters at Site A is consistent with leaching of this chemical from prior ordnance detonation and disposal activities (RDX is relatively soluble in water), followed by rapid transport through the Perched Groundwater Zone with slower migration of the leaked material through the underlying Shallow Aquifer. As RDX concentrations in the Perched Groundwater Zone have declined, past RDX releases have accumulated within the relatively poorly flushed Shallow Aquifer.

Detectable concentrations of RDX are largely confined within the boundary of the Burn Area, within an estimated groundwater volume of less than 300,000 gallons (Figure 6). RDX has occasionally been detected in areas north of the Burn Area, though these

detections have all been at concentrations near the analytical detection limit. Additional sampling of the Shallow Aquifer is ongoing (using an improved low-level analytical method) to more precisely define the boundary of RDX contamination in this area. No ordnance compounds have been detected in off-site wells at Vinland screened in the Shallow Aquifer.

The Sea Level Aquifer is located below the Shallow Aquifer. The Sea Level Aquifer is separated from the Shallow Aquifer by approximately 140 feet of low permeable soils, providing an effective barrier to downward migration of water. This deeper aquifer is regionally extensive and is used for municipal water supply within the community of Vinland. Ordnance compounds have not been detected in any of the local Sea Level Aquifer wells.

Lead and bis(2-ethylhexyl)phthalate were occasionally and sporadically detected in surface waters and groundwaters throughout Site A at concentrations exceeding published water supply action levels of 15 μg/L and 4 μg/L, respectively (Table 1). However, similar concentrations of these chemicals were observed at locations beyond the influence of Site A, and may represent an area background condition. The detection of these chemicals in water was also not correlated with detections in soil media. For these reasons, lead and bis(2-ethylhexyl)phthalate were not considered contaminants of concern in water at Site A. Similarly, PCBs were not detected in water samples collected from Site A.

7.0 SUMMARY OF SITE RISKS

All chemicals detected at Site A were screened following EPA's 1989 Risk Assessment Guidance for Superfund to identify those chemicals which in the aggregate contribute 99 percent or more of the cumulative site risk. Selection of such indicator chemicals was based on consideration of the concentrations encountered, environmental mobility, and toxicity. Chemicals eliminated in the screening process included several metals (e.g., arsenic), herbicides (e.g., 2,4-D), and some ordnance degradation products (e.g., 2,6-diamino-4-nitrotoluene). The eliminated chemicals were either present at concentrations typical of natural background conditions or were below conservative risk-based criteria. Some of the eliminated chemicals lacked quantitative toxicity information necessary to assess human health or environmental risks.

The screening procedure identified 25 constituents which may be of concern at Site A. These indicator chemicals include: eight metals and inorganics (pH, barium, cadmium, chromium, copper, lead, nickel, and zinc); eleven ordnance chemicals (predominantly TNT, DNT, RDX, and associated compounds or by-products), four phthalate esters (e.g., bis[2-ethylhexyl]phthalate); and two PCBs (Aroclor 1254 and 1260).

A quantitative human health risk assessment and semi-quantitative ecological evaluation was performed for Site A to assess baseline risks at the site under a no-future-action

scenario. Only those exposure pathways likely to be important to the overall human health risk assessment were retained for quantitative evaluation, as summarized in Table 2. For each individual waste area which comprises Site A, reasonable maximum human exposures were estimated for the following pathways:

- Direct dermal (skin) contact with soils;
- Incidental soil ingestion;
- Air inhalation of dusts and vapors; and
- Drinking water consumption.

Detailed exposure and toxicity assessments formed the basis for the characterization of chemical risks posed by Site A, using assumptions and methodologies defined by EPA. Exposure within each of the waste areas was represented by an occupational (industrial) site use scenario, while residential exposures were assumed at the boundary of each area. The individual and residential exposure scenarios were reasonable given the size of individual areas which make up the site. Potential exposure pathways are depicted on Figure 7. A summary of exposure factors used to compute chemical intakes is presented in Table 3.

For carcinogens, the baseline risk is presented as the possible (upper-bound) risk of contracting some form of cancer given lifetime exposure to a chemical. Federal guidelines for acceptable upper-bound cancer risk range from a chance of 10^{-4} (1 in 10,000) to 10^{-6} (1 in 1,000,000) of developing cancer due to exposure to a carcinogen. The comparable cancer risk range recognized by the Washington State Model Toxics Control Act (Chapter 173-340 WAC) is 10^{-5} to 10^{-6}.

Non-carcinogenic risk is evaluated by dividing the daily dose resulting from site exposure by the EPA estimate of acceptable intake (or reference dose) for chronic exposure. If the ratio between these values (termed the Hazard Quotient) is less than 1, then non-carcinogenic risks are not indicated. Conversely, Hazard Quotient values greater than 1 indicate a potential risk to human health.

The baseline lifetime cancer risks within each area of Site A were calculated for the reasonable maximum exposure condition. The highest cumulative risk occurred in the Burn Area (3×10^{-4} or 1 in 3,000), largely attributable to potential RDX exposures from a hypothetical Shallow Aquifer drinking water well installed adjacent to this area. Chemical- and pathway-specific risk calculations for the Burn Area are summarized in Table 4. Calculated excess cancer risks at Debris Area 2 were 3×10^{-5}, or 1 in 30,000. Calculated cancer risks attributable to Debris Area 1 or the Stormwater Discharge Area were less than 10^{-6} (1 in 1,000,000). Results of the baseline risk assessment are summarized in Table 5.

Table 5. Summary of Baseline Cancer Risk Estimates at Site A
(Non-cancer Hazard Indices are presented in parentheses)

Exposure Area	Soil/Dust Exposure	Groundwater Exposure
Burn Area	7×10^{-5} (4)	2×10^{-4} (1)
Debris Area 1	8×10^{-7} (0.03)	no exposure
Debris Area 2	3×10^{-5} (0.5)	no exposure
Stormwater Area	6×10^{-7} (0.04)	no exposure
Off-site Resident	4×10^{-6} (0.1)	1×10^{-6} (0.1)

The greatest degree of non-carcinogenic human health risk at Site A is posed by on-site exposures in the Burn Area, where chronic toxicity criteria for TNT may be exceeded by approximately four-fold (Tables 4 and 5). Direct dermal contact represented the primary pathway of exposure contributing to estimated non-carcinogenic risks. Calculated non-cancer hazards for all other chemicals and in all other waste areas were below risk criteria.

The cumulative off-site baseline cancer risk calculated for a hypothetical individual residing immediately adjacent to Site A was equal to 6×10^{-6}, or 1 in 200,000. Potential carcinogenic risks due to individual hazardous substances were all at or below 1 in 1,000,000. Similarly, calculated non-cancer hazards were below risk criteria.

Significant sources of uncertainty in the baseline human health risk assessment include the following:

- The variability of ordnance concentrations at Site A, particularly in surface soils and the Shallow Aquifer, contributed substantially to the total uncertainty in the risk characterization estimates. The statistical procedure used to derive exposure point concentrations (i.e., upper 95 percent confidence limits of the data) may overestimate actual risks at Site A.

- Dermal contact with soils containing ordnance compounds accounted for approximately 90 percent of the calculated direct contact risk at Site A under reasonable maximum exposure assumptions. However, the dermal absorption rate in this case has not been characterized, but was conservatively estimated considering the limited available data.

- Because of limited toxicologic data, the carcinogenicity of both TNT and RDX is considered by EPA to be "possible", though not confirmed. Other groups, however, argue that the available data are not sufficient to consider these ordnance compounds as carcinogens (e.g., Oak Ridge National Laboratory).

In addition to the human health risks discussed above, potential risks to sensitive aquatic and terrestrial biota in the site vicinity were assessed in a screening-level ecological evaluation. Risks associated with site discharges were assessed by comparing observed water quality data with applicable state and federal ambient water quality standards. Based on this analysis, no aquatic life risks attributable to any areas of Site A were identified. Neither aquatic toxicity tests nor quantitative stream evaluations were performed.

The potential impact of contaminants on terrestrial biota inhabiting the site vicinity was also evaluated. This screening-level evaluation considered potential contaminant exposures to four representative organisms identified during terrestrial surveys. The representative organisms included a hawk, fox, deer, and vole (rodent). Semi-quantitative exposure estimates were based on literature models and contaminant concentrations detected in surface soil, vegetation, and surface water at Site A. The exposure estimates were then compared with conservative toxicity criteria largely developed to address human health risks. Based on this comparison, potential risks to terrestrial wildlife were identified in both the Burn Area and Debris Area 2. The primary risk identified in this screening-level evaluation was associated with elevated lead concentrations present in soils at Debris Area 2.

Several wetland habitats and bird and mammal species of special concern are known to occur within the general site vicinity. However, these critical habitat areas occur outside of the remedial action area. No Natural Resources Damages issues have been identified at the site.

The results of the baseline risk assessment indicate that the cumulative cancer risk calculated for Site A exceeds the upper-bound Superfund guideline of 10^{-4}, largely as a result of potential exposure to RDX present in the Shallow Aquifer. Further, potential non-cancer risks attributable to direct contact soil exposures at the Burn Area also exceed human health criteria. Elevated lead concentrations present in soils at Debris Area 2 may represent a potential ecological concern to sensitive species (e.g., rodents).

Based on these results, exceedence of CERCLA health-based thresholds is indicated for both soil and groundwater at Site A, but only at the Burn Area. Actual or threatened releases of hazardous substances from Site A, if not addressed by implementing the response action selected in this ROD, may therefore present an imminent and substantial endangerment to public health, welfare, or the environment.

8.0 CLEANUP STANDARDS

Cleanup objectives for Site A were developed based on results of the human health and ecological risk assessments and applicable or relevant and appropriate requirements, including the recently adopted (February 1991) Cleanup Standards Amendments to the

Washington State Model Toxics Control Act (MTCA; Chapter 173-340 WAC). The MTCA standards utilize a combination of risk-based criteria and applicable state and federal laws to derive site-specific cleanup levels. The MTCA standards have been interpreted to be applicable to soil and groundwater cleanup actions at Site A, and were generally more stringent than those calculated based on the site-specific risk assessment discussed above. The MTCA cleanup levels are also relevant and appropriate as standards for treated soil and water being returned onto or within the site. A comparison of site conditions with MTCA Method B (standard method) cleanup levels is presented in Table 1 and is discussed below.

Surface Soil in the Burn Area. Surface soils of the Burn Area contain concentrations of TNT and DNT which exceed applicable MTCA cleanup levels for direct soil contact exposure, derived based on an assumption of future residential site use. Because of the observed correlation between individual ordnance chemicals, the overall soil remedial action objective can be expressed as a TNT concentration of approximately 30 mg/kg. Approximately 7,000 cubic yards of soil in this area exceed the MTCA cleanup level.

From an evaluation of the partitioning of contaminants between the surface soils, the Perched Groundwater Zone, and the Shallow Aquifer, it is likely that the MTCA soil cleanup level for protection of groundwater at Site A will be met by removing soil with greater than 30 mg/kg TNT. As discussed in Section 10.0, this condition will be verified through compliance monitoring of groundwater quality in the Perched Groundwater Zone and the Shallow Aquifer, and will be addressed during the first five-year review.

Surface Soil in Debris Area 2. Similar to the Burn Area, surface soils in Debris Area 2 exceed the 30 mg/kg cleanup level for TNT. This same area also exceeds the range of applicable soil lead cleanup levels (again assuming residential use) of 250 to 500 mg/kg. In consideration of potential ecological risks associated with lead exposures in this particular area, the soil remedial action objective was set at the lower end of this range, 250 mg/kg. An estimated 100 cubic yards of soil at Debris Area 2 exceeds the cleanup level.

Stormwater Discharge from the Burn Area. Based on water quality data collected during the remedial investigation of Site A, stormwater discharges from the Burn Area may periodically exceed surface water quality criteria for some ordnance compounds such as TNT and RDX. However, soil remediation to the 30 mg/kg TNT cleanup level will reduce the mass (and maximum concentrations) of TNT present on the site by approximately 95 percent, which should result in a similar reduction in on-site stormwater concentrations. Source controls will thus reduce TNT concentrations in waters discharged to this area to below the MTCA cleanup levels.

Based on the correlation of TNT and RDX concentrations, a 90 percent reduction in the mass of RDX in site soils is also expected from soil cleanup. Given these reductions, the MTCA surface water cleanup levels (WAC 173-340-730[3]) will be achieved on-site

following a soil cleanup action. Accordingly, no additional cleanup actions should be necessary to achieve surface water quality criteria at Site A. This condition will be demonstrated through surface water compliance monitoring, once the soil cleanup action is completed.

Perched Groundwater in the Burn Area. Some of the older perched groundwater wells at Site A have TNT, DNT, and RDX at concentrations above MTCA groundwater cleanup levels. However, the wells with the highest levels of these chemicals do not appear to have competent seals to prevent down-hole contamination by surface water. Newer wells completed in the Burn Area contain lower concentrations of most contaminants (except RDX). Abandonment of the older monitoring wells, consistent with state regulations, is identified as a general response action at Site A.

With the exception of RDX, perched groundwater concentrations collected from newly installed wells with proper surface seals are below MTCA groundwater cleanup levels. However, current concentrations of RDX in the seasonal Perched Groundwater Zone range from less than 0.1 to 61 μg/L, which exceeds the MTCA Shallow Aquifer protection criterion of 0.8 μg/L (Table 1; WAC 173-340-720). The RDX concentrations detected in the Perched Groundwater Zone also exceed the quantitation limit (PQL) of 5 μg/L for this compound as defined through EPA's Contract Laboratory Program.

As discussed in Section 6.3 above, RDX concentrations within the Perched Groundwater Zone have declined over the past 10 years at an average rate of approximately 30 percent per year. Concentrations measured in the Perched Groundwater Zone are also lower than those detected in the underlying Shallow Aquifer. Based on both the historical monitoring data and the results of contaminant transport modeling, there is greater than a 95 percent probability that the 0.8 μg/L MTCA criterion will be achieved throughout the Perched Groundwater Zone before the year 2000, even in the absence of any remediation. Soil cleanup (90 percent reduction in the soil mass of RDX) will speed the process.

As discussed in Section 9.2 below, the Perched Groundwater Zone is expected to be remediated through a combination of source control (i.e., soil treatment) and groundwater treatment of the Shallow Aquifer. Additional sampling is ongoing, and will continue, to verify the expected reductions in RDX concentrations of the Perched Groundwater Zone. Compliance with the MTCA groundwater protection criterion will be assessed with these monitoring data, which will be reviewed within five years of commencement of the cleanup action, consistent with the Federal Facility Agreement for SUBASE, Bangor.

Shallow Aquifer below the Burn Area. Concentrations of RDX above the MTCA groundwater cleanup level have been detected in the Shallow Aquifer beneath the central portion of the Burn Area. The maximum RDX concentration (189 μg/L) detected in this area is above the MTCA risk-based cleanup criterion (based on drinking water use) of 0.8

μg/L and the current PQL of 5 μg/L. The MTCA groundwater cleanup level is applicable throughout the Shallow Aquifer.

Detections of RDX above the 0.8 μg/L cleanup level have also been reported in areas north of the Burn Area. However, these reported detections have nearly always been below the current PQL for RDX of 5 μg/L. Following procedures set forth in the MTCA (WAC 173-340-707), compliance with the RDX cleanup level is considered to be attained when concentrations are present below the PQL. Additional sampling of the Shallow Aquifer is ongoing (using an improved low-level analytical method) to more precisely define the boundary of RDX contamination in this area.

Off-site Risks. Current off-site exposures in the community of Vinland are below MTCA risk-based cleanup levels and within the range of acceptable risks defined under Superfund and the MTCA. Application of the soil cleanup level at the Burn Area (30 mg/kg TNT) will result in further reductions in the off-site risk. As stated above, monitoring of the Shallow Aquifer upgradient of Vinland will continue as long as necessary in order to verify that Vinland groundwater users are adequately protected.

9.0 DESCRIPTION AND COMPARISON OF ALTERNATIVES

9.1 Soil Remediation Alternatives

The general response actions initially considered for soil remediation included the following: Continued Monitoring; Institutional Controls; Containment; Removal; Treatment; and Stabilization. Within each of these response actions, technologies were identified which may be applicable to site remediation.

A wide range of soil remediation alternatives were initially identified for screening and of these, five were subsequently selected for detailed analysis. The alternatives selected for more detailed analysis included: No Action/Continued Monitoring; Limited Action; Cover; Solidification; and Soil Washing. A detailed analysis was performed on each of these alternatives. The following features were found to be common to all (except No Action/Continued Monitoring):

Existing Controls. Site A currently has some control features in place. Institutional controls include restrictions to site access. The Burn Area is enclosed with a chain-link fence which is locked and posted with no-admittance signs. Containment features include collection of surface water runoff from the Burn Area, and direction of these waters to the Stormwater Discharge Area.

Long-Term Groundwater and Surface Water Monitoring. For those alternatives which leave Burn Area soils on site without permanent treatment, long-term groundwater and surface water monitoring would be conducted. Monitoring would continue for more than

30 years or until contaminant concentrations drop below specified remedial action objectives.

Aspects unique to each of the five alternatives are presented below.

No Action

The No Action Alternative provides a baseline for comparing other alternatives. No remedial activities would be conducted under this alternative.

Limited Action

In addition to the common items discussed above, the main component of this alternative is a permanent Naval order preventing any future use of the site.

Soil Washing

The Soil Wash Alternative uses a three-step process. First, soils with contaminant concentrations in excess of direct contact cleanup levels are excavated and placed in a lined leach basin (treatment unit) constructed on site. The soil will be excavated to a depth of approximately 1 foot and the site regraded and revegetated. The excavated soils will be modified as necessary by mechanical or chemical means to ensure that the treatment (washing) process will be effective and efficient. Second, water is allowed to percolate through the entire 7,100-cubic yard batch of contaminated soil to dissolve ordnance chemicals from the soil and promote the migration of these contaminants with the leachate. Filter layers on the bottom strain out the soil fines, and the leachate is collected from below these filter layers.

The third and final component of the Soil Washing process is treatment of the leachate to remove accumulated contaminants. Water treatment by natural photolysis, ultraviolet (UV)/oxidation, or carbon adsorption is effective in removing ordnance from water. These leachate treatment processes are also common to the groundwater extraction and treatment alternatives. The leachate would be recirculated through the system, effectively establishing a closed process, with no on-going discharge. Upon completion, the treated soils will be left on site.

The effectiveness of the soil washing process for ordnance is well documented and has been demonstrated in pilot-level studies performed at Site A and other similar sites (e.g., Site F). The solubility of these chemicals (particularly RDX) in water is conducive to the leaching of these materials from soil. Given proper design, the washing process could reduce soil contaminant concentrations within the Burn Area to achieve MTCA cleanup levels within a time period of one year from start of the soil washing operation.

All three leachate treatment options (natural photolysis, UV/oxidation, and carbon adsorption) have been shown to be effective in reducing the concentrations of "parent" ordnance products such as TNT and RDX to levels which will allow treatment of soils to below MTCA cleanup levels. However, the natural photolysis option can, under some conditions, result in the formation of potentially toxic ordnance by-products. The effectiveness of the various leachate treatment options is discussed further under the Groundwater Remediation section of this ROD (Section 9.2).

Under this alternative, the limited quantities of soil (100 cubic yards) at Debris Area 2 which exceed direct contact cleanup levels will also be excavated and placed within a separate cell in the Soil Washing basin constructed at the Burn Area. Although ordnance contaminants present in the Debris Area 2 soils will be treated by this process, the Soil Washing process is not effective in reducing lead concentrations, which are only found above action levels at Debris Area 2. Nevertheless, following the MTCA regulations (WAC 173-340-360[5]), the lead expected to remain in these soils following completion of the soil washing is considered a residue from a permanent treatment process. These soils will be disposed of at a permitted off-site landfill.

Cover

The main component of the Cover Alternative is a 130,000-square-foot low permeability geomembrane cap constructed over the contaminated soil. Soils in the northern and southern portions of the Burn Area which exceed direct contact cleanup levels, along with burn mound and Debris Area 2 soils, will be relocated to beneath the cap area. The cap slope will conform approximately to the existing site slope - about 5 percent. Shallow-rooted vegetation will be planted on the surface of the cap to prevent erosion. Future land use within the immediate vicinity of the capped area of Site A will still be restricted by deed.

Solidification

The primary component of this alternative is solidification of soil exceeding the direct contact cleanup level to an *in situ* depth of 1 foot. The solidification reagent type and quantity will be determined during final design, although common components include Portland cement, fly ash, kiln dust, and lime. To protect the solidified mass from weathering, it will be covered with 18 inches of soil and the surface revegetated with grass. Future land use at Site A will still be restricted by deed in the immediate vicinity of the solidified soils.

9.2 Groundwater Remediation Alternatives

Similar to the soil remediation, a wide range of groundwater cleanup alternatives were initially identified for screening, and of these four were subsequently selected for detailed

analysis. The alternatives selected for more detailed analysis included: No Action; Pump and Treat by Natural Photolysis; Pump and Treat by UV/Oxidation; and Pump and Treat by Carbon Adsorption.

A feature common to all of the groundwater alternatives is the assumed cleanup of the Perched Groundwater Zone through the (natural) flushing of the single identified groundwater contaminant (RDX) into both Vinland Creek and the Shallow Aquifer. Existing releases of RDX into Vinland Creek do not exceed MTCA surface water cleanup levels.

Remediation of the perched zone sufficient to achieve underlying aquifer protection criteria, defined under the MTCA, is expected to occur (naturally) within a five- to ten-year period, even in the absence of any cleanup action. The restoration time frame will be substantially shortened as a result of the soil cleanup action. Compliance with the MTCA groundwater protection criterion will be assessed with monitoring data, which will be reviewed within five years of commencement of the cleanup action, consistent with the Federal Facility Agreement for SUBASE, Bangor.

Restoration of the aquifer to be protected (the underlying Shallow Aquifer) will also likely require a 10-year restoration time frame (see below). Testing of the both the Perched Groundwater Zone and Shallow Aquifer will be conducted throughout this period to ensure that the cleanup proceeds as predicted. As part of the first five-year review of the overall site groundwater cleanup the need for additional restoration of the Perched Zone will evaluated. Alternatives to be considered in this case include introduction of treated groundwater into the Perched Zone, as outlined below.

The No Action Alternative would not include any construction activities. However, long-term groundwater monitoring (more than 30 years) would be necessary to ensure that site groundwaters do not pose excessive risks to Vinland groundwater users.

Detailed analyses were performed for each of the three aquifer restoration alternatives. The following features were found to be common to all:

Well Abandonment. Groundwater monitoring wells previously installed by the Navy at Site A may be functioning as conduits for vertical migration of contaminants. All such wells will be abandoned, in accordance with the methods described in the Washington Administrative Code (Chapter 173-160 WAC) or as approved by Ecology. Well abandonment methods will include perforating the PVC well casing and pressure grouting with bentonite to create an effective seal and barrier to vertical migration of contaminants. The sealed wells will be capped with a concrete plug at the ground surface.

Groundwater Extraction/Reintroduction. Based on the results of numeric contaminant transport modeling of the Shallow Aquifer system, groundwater extraction without

reinjection would require a time frame of more than 10 years to achieve the MTCA cleanup level of 0.8 μg/L RDX. This rate was judged too slow for implementation of an effective aquifer restoration program. However, by combining groundwater extraction with reintroduction of the treated water into the Shallow Aquifer, the rate and efficiency of restoration can be increased substantially.

Groundwater restoration alternatives involving extraction and reintroduction were evaluated using mathematical models developed by the U.S. Geological Survey (Method of Characteristics) to simulate groundwater flow and contaminant transport conditions. Input to the model was based on a number of conservative parameter values, including the assumption that the entire Shallow Aquifer beneath the Burn Area contains RDX at the highest concentration observed (189 μg/L). Because of conservative input values, use of the model is expected to generally overestimate the number of wells and flow rates required to achieve the cleanup levels. Additional groundwater monitoring is ongoing to refine the extent of RDX contamination in the Shallow Aquifer.

Based on the results of the modeling, a remediation design utilizing a well grid spacing of 100 feet between extraction and reintroduction well pairs would likely achieve the groundwater cleanup level for RDX (0.8 μg/L) within a restoration time period of 10 years. An estimated total of 8 extraction and 15 injection wells, pumping a combined flow of approximately 12 gallons per minute, appears from this analysis to represent a feasible cleanup option. Largely because of the low permeability of the Shallow Aquifer material, accelerated cleanup using a larger number of wells would not be practicable. A conceptual layout (including number of wells) of the extraction and reintroduction system is presented on Figure 8. Further refinement of the layout will be required for final design.

As discussed above, in the unlikely event that the first five-year review reveals that substantial progress in remediating the Perched Groundwater Zone to the 0.8 μg/L Shallow Aquifer protection criterion has not been made, an additional component of the groundwater remediation will be considered. Alternatives to be considered would include installation of infiltration systems in the upper Recessional Outwash deposits to provide additional flushing of the Perched Groundwater Zone into the Shallow Aquifer. Reintroduction rates would be controlled to optimize flushing conditions.

Aspects unique to each of the alternatives are presented below.

Pump and Treat by Natural Photolysis

Natural photolysis will expose site groundwaters to natural sunlight to accomplish ordnance degradation. The alternative will include construction of a 1 million-gallon impoundment within the Burn Area sufficient to achieve a water residence time within the basin of 1 to 2 months. Based on literature reports of the rapid decay of compounds such as TNT and RDX in surface waters (half-lives on the order of one to ten days), considerable photolytic

degradation can be expected. However, this technology has never been evaluated for treatment at the scale required at Site A. Further, potentially toxic by-products can be formed under some conditions. Minor atmospheric releases of ordnance may occur under this alternative.

Because natural photolysis is still an innovative technology, some additional laboratory testing of the treatment system will be necessary to verify that the treatment system is effective in removing all potential chemical toxicants in Site A groundwaters. If the groundwater treatment criteria are not achieved with the natural photolysis system, then additional treatment technologies (polishing treatment) will be incorporated into the treatment design to achieve the treatment criteria.

Pump and Treat by UV/Oxidation

Ultraviolet (UV)/Oxidation treatment has been applied in pilot-scale and small field-scale applications to break apart complex organic chemicals and convert them into components such as carbon dioxide, water, and nitrate. Although relatively minor quantities of RDX by-products can be formed under some UV/Oxidation treatment conditions (e.g., formic acid), the treatment system can generally be optimized to prevent the formation of potential toxicants.

Because UV/Oxidation is still an innovative technology, some additional laboratory testing of the treatment system will be necessary to verify that the treatment system will be effective in removing all potential chemical toxicants in Site A groundwaters. Treatability studies using UV/Oxidation are currently being performed to verify that the treatment system will be effective at treating low level concentrations of ordnance under the conditions which exist at Site A. The available information suggests that a UV/Oxidation system can be designed which will achieve the required treatment levels for groundwater disposal. No toxic air emissions are anticipated under this alternative.

If the groundwater treatment criteria are not achieved with the UV/Oxidation system due to either technological or economic reasons, then additional treatment technologies (polishing treatment) will be incorporated into the treatment design to achieve the treatment criteria.

Pump and Treat by Carbon Adsorption

The Carbon Adsorption Alternative will involve a proven treatment process which can attain all cleanup levels. In this case, however, the contaminants are initially transferred from the water to the carbon solid phase. This alternative will generate spent carbon waste requiring transport and off-site disposal by incineration. Although no on-site air emissions are anticipated under this alternative, off-site releases can occur during final incineration and treatment of the spent carbon.

10.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

Each of the soil and groundwater remediation alternatives discussed above were evaluated against the nine criteria established by EPA guidelines. The No Action Alternative was included as a baseline comparison. The following sections evaluates the alternatives by the nine applicable criteria, with separate comparisons of soil and groundwater alternatives.

10.1 Evaluation of Soil Remediation Alternatives by Criteria

Overall Protection of Human Health and the Environment

All of the alternatives except No Action provide adequate protection of human health. Existing institutional controls are used in the Limited Action Alternative to prevent exposure. Ecological risks, as defined by the risk assessment, will be adequately protected under all alternatives except No Action and Limited Action.

Compliance with ARARs

The MTCA cleanup regulation does not recognize institutional controls as a substitute to cleanup actions which would otherwise be technically possible. Accordingly, both the No Action and Limited Action Alternatives will not comply with applicable or relevant and appropriate requirements (ARARs). The remaining alternatives will achieve ARARs.

Soils at Site A do not exceed designation criteria for characteristic dangerous (state) or hazardous (federal) wastes, and are not listed hazardous wastes. Thus, dangerous and hazardous waste handling, treatment, and disposal requirements (e.g., Land Ban restrictions) are not ARARs for soil remediation.

Long-Term Effectiveness and Permanence

The Soil Wash Alternative provides the most reliable long-term performance because it uses treatment to permanently reduce the risks from site contaminants. No long-term maintenance is required for this alternative, although groundwater monitoring will occur during the treatment period to detect leaks in the treatment basin liner system.

The Cover Alternative will use a membrane cap to reduce human and wildlife exposure to contaminated soils; the cap will be effective in the long-term with proper maintenance. The Limited Action Alternative will rely upon institutional controls to prevent human exposure; its long-term effectiveness will depend on compliance with the access and land-use restrictions. However, the Limited Action Alternative cannot address possible ecological risks. The Solidification Alternative will immobilize the contaminants, and the stabilized soil should remain intact in the long-term.

Reductions in Toxicity, Mobility, and Volume through Treatment

The Soil Wash Alternative will reduce toxicity of the soil through treatment. The Solidification Alternative will use stabilization to reduce the mobility of contaminants. None of the other alternatives use treatment technologies.

Short-Term Effectiveness

During remedial construction activities, human exposure to contaminated soils and dusts may occur at levels greater than baseline conditions. However, based on the results of the risk assessment, potential human health and ecological risks arising from short-term construction activities (due to unmitigated dust generation and inhalation) are not identified as a health concern. There may be some elevated noise levels during construction. Construction activities will be designed to minimize these potential short-term effects, where possible.

The Limited Action Alternative has the greatest short-term effectiveness since no work will be done with contaminated soil; site access restrictions could be implemented almost immediately. The Cover and Solidification Alternatives will achieve protection within about 6 months. The Soil Wash Alternative will result in the contaminated soil being contained within about three months; the treatment will be complete within about one year, depending upon final design. (The estimated completion times are based on time from start of implementation.)

Implementability

The Limited Action Alternative will be the simplest to implement. There are no special requirements. Access restrictions could be easily expanded to accommodate any additional contamination identified at the site.

The Cover and Solidification Alternatives will use standard construction techniques. These alternatives have no operational requirements. Solidification is more complex because of the stabilization process. Bench testing will be required during final design to determine which combination of stabilization additives will result in appropriate reductions in contaminant mobility.

The Soil Wash Alternative also uses standard techniques to construct the leach basin. Excavated soils may require modification by mechanical and/or chemical means, prior to placement in the leach basin, to ensure effective and efficient operation. This alternative also requires operation of a treatment system, which will require regular monitoring and maintenance. Alternative treatment systems include Natural Photolysis, UV/Oxidation, and Carbon Adsorption which vary in their implementability, as discussed under the

groundwater remediation options. The operation may require adjustment or modification based on actual performance.

Cost

The cost of each soil/surface water cleanup alternative, in order of increasing present worth, is shown below:

Alternative	Present Worth Cost
No Action	$ 670,000
Limited Action	800,000
Soil Wash	890,000*
Cover	1,530,000
Solidification	1,850,000

*Note: The estimated present worth cost for the Soil Wash Alternative does not include treatment costs, since the treatment methods are also common to groundwater remediation alternatives, as presented below.

State Acceptance

The State of Washington Department of Ecology concurs with the selected remedial action at Site A. Comments received from Ecology have been incorporated into this Record of Decision.

Community Acceptance

Public comments were received during the public review period and at the public meeting. The public presented no significant objection to the proposed plan which is now the selected remedy. The attached Responsiveness Summary contains the public's comments and the agency's responses.

10.2 Evaluation of Groundwater Remediation Alternatives by Criteria

Under all alternatives except No Action, construction activities necessary to implement groundwater restoration will occur on or immediately adjacent to the Burn Area. No construction will occur off-base.

Overall Protection of Human Health and the Environment

Under the No Action Alternative (as evaluated in the baseline risk assessment), potential cancer risks resulting from exposures to RDX exceed 10^{-4}. However, existing institutional controls presently prevent consumptive use of groundwaters in this area. All three treatment alternatives considered (Natural Photolysis, UV/Oxidation, and Carbon Adsorption) are capable of reducing concentrations of the target contaminants (e.g., RDX and TNT) to levels below the MTCA cleanup levels. However, under the Natural Photolysis Alternative, potentially toxic by-products can be formed (under some conditions) which could be reintroduced into the Shallow Aquifer. Effluent polishing may be required in this case to achieve adequate protection of public health.

Compliance with ARARs

All three treatment alternatives would satisfy all ARARs, including action-specific and chemical-specific provisions of the MTCA Cleanup Standards. The No Action Alternative does not meet these ARARs.

The three treatment alternatives include the reintroduction of groundwater into the Shallow Aquifer. Provisions of the state groundwater quality standards (WAC 173-200) are applicable chemical-specific treatment standards for water discharged to the aquifer. The treatment standard for RDX as promulgated by the groundwater quality standards is 0.8 μg/L, identical to the relevant and appropriate MTCA groundwater cleanup level (WAC 173-340-720). The treatment technology for the extracted groundwater under all treatment alternatives will meet these ARARs. Requirements of the State Minimum Standards for Construction and Maintenance of wells (WAC 173-160), are applicable action-specific ARARs for the design of extraction and compliance monitoring wells. Re-introduction wells will conform with the Class V designation (aquifer remediation well) under the Underground Injection Control Program (WAC 173-218).

Long-Term Effectiveness and Permanence

The long-term effectiveness of existing institutional controls under the No Action alternative can be assured as long as the land downgradient of Site A (toward Cattail Lake) remains under the control of SUBASE. The treatment alternatives will provide long-term effectiveness because they use permanent treatment methods.

Reductions in Toxicity, Mobility, and Volume through Treatment

All treatment alternatives reduce the toxicity of target site contaminants such as RDX. However, under the Natural Photolysis Alternative, potentially toxic by-products could be formed (under some conditions) which may be reintroduced into the Shallow Aquifer.

The UV/Oxidation and Carbon Adsorption Alternatives differ in the method used to reduce the toxicity and volume of contaminants. UV/Oxidation treatment will provide final treatment and thus primary reduction in toxicity and volume of contaminants. Alternatively, Carbon Adsorption treatment will provide removal of contaminants from the groundwater to the carbon, thus effecting a reduction in toxicity and volume of contaminants in the groundwater. The carbon will then require final off-site treatment by incineration.

Short-Term Effectiveness

During remedial construction activities, human exposure to contaminated soils and groundwater may occur at levels greater than baseline conditions. Such exposures will be mitigated by the use of protective gear during construction activities when potential exposure conditions exist.

All of the treatment alternatives can be commenced within a 15-month period after Record of Decision signature. However, the implementation schedule for the Natural Photolysis and UV/Oxidation Alternatives are predicated on successful completion of treatability studies. The groundwater treatment alternatives will require an estimated 10 years to complete (minimum several years).

During operation of groundwater remediation, further spreading of contaminants in the groundwater will be prevented, thereby protecting any potential downgradient water supplies.

Implementability

Of the three treatment alternatives, Carbon Adsorption is the least implementable because of the present limitation of facilities which handle disposal of the spent carbon. Both the UV/Oxidation and Natural Photolysis Alternatives will require a treatability study to verify that the treatment systems are effective. The UV/Oxidation treatability study has already commenced.

Cost

The cost of each groundwater cleanup alternative, in order of increasing present worth, is shown below:

Alternative	Present Worth Cost
No Action	$ 670,000*
Pump and Treat by:	
Natural Photolysis	1,150,000
UV/Oxidation	1,810,000
Carbon Adsorption	3,450,000

*Note: The estimated present worth cost for the No Action Alternative is a duplication of the No Action Alternative presented previously.

State Acceptance

The State of Washington Department of Ecology concurs with the selected remedial action at Site A. Comments received from Ecology have been incorporated into this Record of Decision.

Community Acceptance

Public comments were provided during the public review period and at the public meeting. The public presented no significant objection to the proposed plan which is now the selected remedy. The attached Responsiveness Summary contains the public's comments and the agency's responses.

11.0 THE SELECTED REMEDY

The alternative selected for the remedial action at Site A includes Soil Washing with UV/Oxidation treatment and groundwater restoration, also with UV/Oxidation treatment. This combined alternative is preferred because it best achieves the goals of the evaluation criteria in comparison to the other alternatives. The leachate and groundwater treatment method selected - UV/Oxidation - employs an innovative technology that provides on-site treatment with permanent reduction in the toxicity, mobility, and volume of ordnance contaminants. Both phases of the remediation (i.e., soil and groundwater cleanup) will likely utilize the same general UV/Oxidation treatment system sequentially.

The remedial action plan, which will cost an estimated $2,700,000 (present worth) includes the following actions:

Well Abandonment:

- Immediately abandon all older monitoring wells which may not have competent surface seals.

Soil Remediation:

- Excavate approximately 7,000 cubic yards of soil from the Burn Area which exceeds MTCA direct contact cleanup levels for ordnance (33 mg/kg TNT; 1.5 mg/kg DNT; and 9.1 mg/kg RDX). Excavate soils from Debris Area 2 which also exceed these action levels and/or 250 mg/kg lead. The excavated soils will be modified as necessary by mechanical or chemical means to ensure that the subsequent treatment (washing) process will be effective and efficient. Place all such soils in a Soil Washing basin constructed at the Site A Burn Area. The soils from Debris Area 2 with lead concentrations exceeding 250 mg/kg will be placed in a separate cell in the soil washing basin. The basin will include a synthetic membrane liner to prevent escape of the leachate. Construction details of the Soil Washing basin will be determined during final design.

- Conduct verification monitoring during and/or following the excavation to assure that all soils exceeding the cleanup levels have been excavated. The point of compliance shall be throughout the Burn Area and Debris Area 2. Evaluate compliance with the cleanup standards using compliance monitoring procedures defined in WAC 173-340.

- Pending successful completion of the ongoing treatability study and subsequent final design, perform soil washing on soils placed in the treatment basin, treating the leachate with a UV/Oxidation treatment system. Recycle the treated water back to the leach basin (zero discharge). Although the soil treatment process is expected to be completed within approximately one year, there is a possibility that a longer time frame may be required to achieve the cleanup levels. In this case, continuation or modification of the soil washing may be addressed during the first five-year review of the cleanup action, in accordance with the Federal Facility Agreement for SUBASE, Bangor.

- Treatment will be considered completed when soils within the basin are below the MTCA direct contact cleanup levels for ordnance (33 mg/kg TNT; 1.5 mg/kg DNT; and 9.1 mg/kg RDX) and when the RDX concentration in the treated leachate is less than the MTCA groundwater protection level for RDX of 0.8 μg/L. Treatment will also be considered complete if the treated leachate concentrations are below updated PQLs. Compliance with the cleanup standards will be determined using compliance monitoring provisions defined in WAC 173-340.

- Upon completion of the soil washing, the basin, liner, and soil contents will all be abandoned in place. A one-foot soil cover will be placed over the treated materials, and revegetated to prevent erosion. The site will be graded to allow for surface water drainage including drainage from the abandoned leach basin. Those Debris Area 2 soils which still contain lead concentrations above 250 mg/kg after treatment will be excavated and disposed of at a permitted off-site solid waste facility.

Groundwater Remediation:

- Following completion of the soil treatment action, groundwater protection will be assessed by monitoring ordnance concentrations in the seasonal Perched Groundwater Zone immediately underlying the Burn Area. The point of compliance for comparison with state groundwater protection (drinking water use) levels will be established throughout the Perched Zone. If compliance with state groundwater protection criteria has not been achieved within five years from commencement of this action, modifications to the groundwater remediation system will be considered, as discussed in Section 11.1.

- Concurrent with the soil washing, conduct additional groundwater monitoring and pilot-level treatability studies to support final design of the groundwater restoration program. The restoration program shall initially be designed to achieve the MTCA groundwater cleanup level for RDX of 0.8 μg/L in the most cost-effective manner within a 10-year period of operation. The point of compliance will be throughout the Shallow Aquifer.

- Pending final design, the groundwater restoration program will include the installation of approximately 8 extraction wells within the vicinity of the Burn Area. The system will operate at a combined flow of approximately 12 gallons per minute. Extracted groundwater will be treated using UV/Oxidation to reduce RDX concentrations to less than 0.8 μg/L or the updated PQL, whichever is greater. In the unlikely event that the results of the treatability study or system performance monitoring data reveal inadequate treatment, there may be a need to install an effective effluent polishing process in order to achieve the treatment standards. Treated groundwater will be reintroduced on site through approximately 15 reinjection wells, configured to facilitate maximum flushing of the aquifer.

- As with any groundwater remediation, the effectiveness of the Shallow Aquifer restoration program at Site A will be continuously monitored and evaluated as a component of operation and maintenance, as discussed below. System operation will cease when it can be demonstrated either that the cleanup standards have been met or that continued operation is no longer practicable, following evaluation criteria defined in WAC 173-340.

Technical analyses, as presented in the Final RI/FS for Site A, have shown that Soil Washing combined with UV/Oxidation treatment of the leachate is feasible and effective in permanently removing and destroying ordnance constituents present in soils. The RI/FS analyses have also demonstrated that groundwater restoration through extraction, UV/Oxidation treatment, and reintroduction should be feasible, though additional data are needed to support final design and implementation.

The cancer risk levels corresponding to the MTCA (Method B) cleanup levels which are the goal of the site cleanup are 1×10^{-6} for individual hazardous substances and 1×10^{-5} for cumulative exposures to multiple hazardous substances and routes of exposure. The cumulative Hazard Index for multiple hazardous substances and routes of exposure is 1. The reasonable maximum exposure assumptions used to derive the MTCA cleanup levels are equivalent or more stringent than the federal Superfund requirements. These standards are within acceptable EPA (NCP) risk criteria.

11.1 Groundwater Remedial Action Measures and Goals

The goal of the groundwater remedial action is to restore Shallow Aquifer waters to support possible future drinking water use. Based on information obtained during the RI, and the analysis of all remedial alternatives, the Navy, EPA, and Ecology believe that the selected remedy should be able to achieve this goal. However, the ability to achieve groundwater cleanup levels at all points throughout the Shallow Aquifer at Site A cannot be determined until a detailed design of the extraction and reintroduction system has been completed, and the system has been implemented, modified as necessary, and the groundwater plume monitored over time.

The selected remedy will include groundwater extraction, treatment, and reintroduction for an estimated period of 10 years, during which time the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

- Discontinuing pumping at individual wells where cleanup goals have been attained;
- Alternating pumping wells to eliminate stagnation points;
- Pulse pumping to allow aquifer equilibrium and encourage adsorbed contaminants to partition into groundwater; and
- Installing additional extraction and/or reintroduction wells in either the Perched Groundwater Zone or Shallow Aquifer to facilitate or accelerate cleanup of groundwater contaminants.

Remedial actions which allow hazardous substances, pollutants, or contaminants to remain on-site must be reviewed not less than every five years after initiation, to ensure the remedy continues to be protective of human health and the environment. Such a review would be conducted in accordance with Part XIX (5 year review) of the Federal Facility Agreement for SUBASE, Bangor. These reviews may result in further modification of the treatment process, consideration of other remedial approaches or revision of the cleanup standards. Changes to the selected remedy or cleanup standards would require formal notification to the public.

11.2 Effectiveness of Treatment Technology

Ultraviolet/Oxidation (UV/Oxidation) is the selected treatment technology for ordnance contaminants present at Site A. It is an innovative technology which has been shown to be successful in treating complex organic compounds, including RDX and TNT.

Combined use of UV with strong oxidants such as ozone and hydrogen peroxide has developed into a successful technology for treating refractory organics in industrial wastewater. UV-catalyzed oxidation, or UV/Oxidation has also been applied to treatment of groundwater contaminants including ordnance compounds.

The basis of enhanced oxidation is the use of UV light and an oxidant source such as ozone or hydrogen peroxide to generate a hydroxyl radical. The hydroxyl radical will aggressively attack and break down complex organic compounds (such as ordnance) by initiating a series of oxidative reactions, converting them into components such as carbon dioxide, water, and nitrate. Although relatively minor quantities of ordnance by-products (e.g., formic acid) can be formed under some UV/Oxidation treatment conditions, the treatment system can generally be optimized to prevent the formation of potential toxicants. Monitoring will be performed throughout implementation of the treatment process to ensure that potential toxicants are not being formed.

The UV/Oxidation technology has been shown to be effective on munitions; however, the application at Site A may require treatment of very low levels of ordnance at a moderate flow rate. Prior studies have been conducted at a level of treatment which was not as stringent as that planned for Site A. A treatability study is currently on-going to verify that the treatment system is effective in meeting the low-level treatment and flow rate requirements of this remedial action at Site A.

If the UV/Oxidation process cannot achieve treatment levels down to the desired criteria due to either technological or economic reasons, then an on-site polishing (e.g., activated carbon) treatment will be coupled with the UV/Oxidation system to complete the treatment process prior to disposal.

12.0 STATUTORY DETERMINATION

The Navy's and EPA's primary responsibility, under their legal CERCLA authorities, is to ensure that remedial actions will protect human health and the environment from the exposure pathways or threat it is addressing and the waste material being managed. Additionally, Section 121 of CERCLA, as amended by SARA, establishes several other statutory requirements and preferences. These specify that, when complete, the selected remedial action must comply with applicable or relevant and appropriate environmental

standards established under federal and state environmental laws unless a statutory waiver is justified.

The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The remedy should represent the best balance of tradeoffs among alternatives with respect to pertinent criteria. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element.

The selected remedial action for Site A at SUBASE, Bangor meets these statutory requirements for both soil and groundwater.

12.1 Protection of Human Health and the Environment

The selected remedial action will protect human health and the environment through extraction and treatment of ordnance in soils and groundwater. The treatment standards support the highest beneficial use of these media (i.e., residential land use and water supply), and is protective of human health and the environment. The ordnance contaminants will be permanently removed from the soil and groundwater through the treatment process which includes destruction by ultraviolet light and oxidation. As necessary, the effluent from the groundwater treatment process will be further treated by a polishing treatment to ensure that the disposed water does not constitute an unacceptable potential risk to human health and the environment.

12.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all applicable or relevant and appropriate chemical-, action-, and location-specific requirements (ARARs). The ARARs are presented below.

12.2.1 Action-Specific ARARs

- State of Washington Hazardous Waste Cleanup - Model Toxics Control Act (Chapter 70.105D RCW) establishes requirements for the identification, investigation, and cleanup of facilities where hazardous substances have come to be located as codified in Chapter 173-340 WAC.

- Requirements of the State of Washington for water well construction as set forth in Chapter 18.104 RCW (Water Well Construction) and codified in Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells), establishes criteria for the construction of extraction and compliance monitoring wells. Criteria for

Class V re-introduction wells are set forth in Chapter 90.48 RCW and codified in Chapter 173-218 WAC.

- The State of Washington has established requirements for control of fugitive dusts and other air emissions during excavation and cleanup related activities, as codified in Chapter 173-400-040 WAC.

- The State of Washington has established safe operating procedures and requirements for hazardous waste operations conducted at uncontrolled hazardous waste sites, as set forth in WAC 296-62 (Part P).

- Federal Clean Water requirements for discharge of treatment system effluent to the waters of the United States, as set forth in 40 CFR 122, establish design standards for wastewater treatment units.

- Water Pollution Control Act (Chapter 90.48 RCW) and Water Resources Act of 1971 (Chapter 90.54 RCW) require the use of all known available and reasonable methods (AKARMs) for controlling discharges to surface water and groundwater.

- The State of Washington Hazardous Waste Management Act (Chapter 70.105 RCW) establishes requirements for dangerous waste and extremely hazardous waste as codified in Chapter 173-303 WAC and may apply depending upon any treatment residuals created. No dangerous wastes have been identified to date.

12.2.2 Chemical-Specific ARARs

Soil and groundwater remediation activities will meet the following chemical-specific ARARs:

- State of Washington Hazardous Waste Cleanup - Model Toxics Control Act (MTCA; Chapter 70.105D RCW) establishes requirements for the identification, investigation, and cleanup of facilities where hazardous substances have come to be located as codified in Chapter 173-340 WAC. Soil and groundwater cleanup standards established under the MTCA are applicable for determining remediation areas and volumes and compliance monitoring requirements, and are relevant and appropriate for determining treatment standards.

- State of Washington Groundwater Quality Standards (WAC 173-200) are applicable chemical-specific standards for water discharged to the aquifer.

- Clean Water Act Section 402 (40 CFR Parts 121-125) and State of Washington Chapter 173-220 WAC (NPDES Permit Program) for effluent discharge may be applicable if effluent is discharged to surface water.

- Ambient concentrations of toxic air contaminants are regulated pursuant to the State of Washington Clean Air Act (Chapter 70.94 RCW) and Implementation of Regulations for Air Contaminant Sources (Chapter 173-403 WAC).

12.2.3 Location-Specific ARARs

There are no location-specific ARARs for this action.

12.2.4 Land Disposal Restrictions

The selected remedy will not involve the placement of RCRA hazardous wastes on site. This being the case, the Land Disposal Restrictions will not apply. However, off-site disposal policy and transportation/manifest requirements are applicable to disposal of treated Debris Area 2 soils at an off-site permitted landfill.

12.2.5 Other Criteria, Advisories, or Guidance To-Be-Considered (TBC)

No other criteria, advisory, or guidance are considered necessary for implementation of this remedial action.

12.3 Cost Effectiveness

The selected Remedial Action is cost-effective because it is protective of human health and the environment and attains ARARs, and its effectiveness in meeting the objectives of the selected remedial action is proportional to its cost. The selected remedy is comparable in cost to many of the other possible combinations of alternatives. However, it employs the use of an innovative treatment technology and will result in the on-site destruction of contaminants and recharge of the extracted and treated groundwater to replenish groundwater supplies. The selected remedy can be implemented in the short-term. The use of carbon adsorption technologies would require off-site treatment where the efficiency of the destruction process could not be assured. The selected remedy provides a much higher degree of certainty that the remedy will be effective in the long-term due to the significant reduction in toxicity, mobility, and volume of wastes through the treatment process.

12.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The Navy, the State of Washington, and the EPA have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner for Site A. The selected remedy will

result in maximum on-site destruction of contaminants and recharge of the extracted and treated groundwater to replenish groundwater supplies.

12.5 Preference for Treatment as Principal Element

By treating the ordnance contaminants present in soil and groundwater media, the statutory preference for remedies employing treatment as a primary element is achieved. The selected remedy will result in maximum on-site destruction of contaminants in both soil and groundwater.

Table 1 – Summary of Chemicals of Concern

	TNT	Total – DNT	RDX	Lead	Total Phthalates (d)	Total PCBs
Soils Concentration in mg/kg						
Burn Area	<0.1–1,300	<0.2–20	<30	<10–80	<1–3	<0.1
Debris Area 2	<0.4–72	<0.5–1.1	<0.4–1.3	10–2,400	<1–2	<0.1–4.1
All Other Areas	<0.4	<0.2	<0.3	<10	<1	<0.1
MTCA Soil Cleanup Level						
Direct Contact (a)	33	1.5	9.1	250	140	4.3
Groundwater Protection (b)	0.29	0.001	0.08	1.5	0.4	0.001
Surface Water Concentration in ug/L						
Burn Area Stormwater	<10–140	<0.1–0.3	<1–39	<10	<1–2	<1
Hood Canal Seepage	<0.1–0.9	<0.1	0.1–17	<10	<1–78	<1
All Other Surface Waters	<0.1–0.3	<0.1–0.3	<0.1–3	<10–19	<1–25	<1
MTCA Surface Water Cleanup Level	31	0.6	30	1	3	<0.01
Groundwater Concentration in ug/L						
Burn Area Perched Groundwater Zone (c)	<0.6	<0.1	<0.1–61	<5–16	<1–27	<1
Burn Area Shallow Aquifer	<0.6	<0.1	<0.1–189	<5–23	<1–40	<1
All Other Groundwater	<0.6	<0.1	<0.1–7	<5–18	<1–30	<1
MTCA Groundwater Cleanup Level	2.9	0.1	0.8	15	4	0.1

(a) The soil cleanup levels are based on potential direct soil contact exposures, as calculated using procedures set forth in WAC 173-340-740 (3)(a)(iii).

(b) Preliminary groundwater protection criteria calculated as 100 times the MTCA groundwater cleanup level, following WAC 173-340-740(3)(ii)(A). Groundwater protection will be addressed at this site by monitoring both the Perched Groundwater Zone and Shallow Aquifer. These compliance monitoring data will be evaluated at the first five-year review (see text).

(c) Based on data collected from newer wells installed in the Perched Groundwater Zone. Some of the older wells installed previously in this area may lack competent surface seals and may not be representative of groundwater conditions.

(d) MTCA cleanup levels for total phthalates are based on bis(2-ethylhexyl)phthalate, which is the most toxic of the phthalates detected at Site A.

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Table 2 - Selection of Exposure Pathways for Quantitative Exposure Assessment

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Quantitative Evaluation ?	Basis for Selection or Exclusion
SUBASE Bangor Workers and Dependents (On-site Work Areas and Off-site Recreational Areas)	Dermal Contact with Chemicals in Soils during On-site Work Activities	Yes	Chemicals of Potential Concern were Detected in Surficial Soils in Areas Potentially Used for SUBASE Operations
	Incidental Ingestion of Chemicals in Soils Following On-site Hand (Dermal) Contact	Yes	Chemicals of Potential Concern were Detected in Surficial Soils in Areas Potentially Used for SUBASE Operations
	Inhalation of Chemicals Contained in Dusts during On-site Work Activities	Yes	Fugitive Dusts Containing Chemicals from Soils may be Released and Inhaled by On-site Workers
	Inhalation of Chemicals Contained in Vapors during On-site Work Activities	Yes	Semivolatile Chemicals Detected in On-site Surficial Soils may Evaporate and be Inhaled by On-site Workers
	Consumption and Contact with SUBASE Water Supplies Containing Site A Chemicals	No	All Present and Anticipated Future SUBASE Water Supply is Derived from Aquifers not Downgradient of Site A
	Dermal Contact and Vapor Inhalation of Chemicals in On-site Surface Waters	No	On-site Surface Waters are Ephemeral; Potential Water Vapor Emissions are Minor Compared with Soil Vapors
	Dermal Contact and Vapor Inhalation of Chemicals in Cattail Lake	No	Cattail Lake Chemical Concentrations were below Drinking Water Advisories; the Dermal Absorption Process is Not Sufficiently Understood at this Time; Cattail Lake is Rarely Used for Swimming or Other Contact Activities; Detected Chemicals are Relatively Non-volatile
	Ingestion of Accumulated Chemicals in Fish and Shellfish from Cattail Lake/Hood Canal	No	No Chemicals of Potential Concern have been Detected in Fish or Shellfish Media; see text
	Dermal Contact/Ingestion of Chemicals in Hood Canal Sediments during Shellfishing	No	No Chemicals of Potential Concern have been Detected in Hood Canal Nearshore Sediments
	Ingestion of Accumulated Chemicals in Fruits and Vegetables Collected near Site A	No	No Residential Gardening Activities Occur in the Area; Wild Fruit Exposure is Expected to be Negligible
	Ingestion of Accumulated Chemicals in Meat from Wildlife Obtained near Site A	No	Meat Exposure is Expected to be Negligible Based on an Analysis of Transfer Coefficients (Travis and Arms, 1988)
Vinland Residents	Dermal Contact with Chemicals in Vinland Creek Sediments during Recreation	Yes	One Chemical of Potential Concern was Detected in Vinland Creek Stream Sediments
	Incidental Ingestion of Chemicals in Sediments Following Hand (Dermal) Contact	Yes	One Chemical of Potential Concern was Detected in Vinland Creek Stream Sediments
	Inhalation of Chemicals Contained in Dusts Transported Off-site to Vinland	Yes	Fugitive Dusts Containing Chemicals from On-site Soils may be Released, Transported, and Inhaled by Vinland Residents
	Inhalation of Chemicals Contained in Vapors Transported Off-site to Vinland	Yes	Semivolatile Chemicals Detected in On-site Surficial Soils may be Released, Transported, and Inhaled by Vinland Residents
	Consumption of Groundwater from Local Wells Installed Downgradient of Site A	Yes	Chemicals of Potential Concern were Detected in Waters Released from Site A; Vinland Residents Use Wells for Water Supply
	Direct Consumptive Use of Vinland Creek as a Drinking Water Source	No	Vinland Creek Stream Flows are Seasonal; No Withdrawals Were Identified; Creek Leakage Addressed in Groundwater Pathway
	Dermal Contact and Vapor Inhalation of Chemicals in Vinland Creek	No	Vinland Creek Stream Flows are Seasonal; Dermal Exposures are Expected to be Negligible Compared with the Leakage Pathway
	Ingestion of Accumulated Chemicals in Fish and Shellfish from Hood Canal	No	No Chemicals of Potential Concern have been Detected in Fish or Shellfish Media; see text
	Dermal Contact/Ingestion of Chemicals in Hood Canal Sediments during Shellfishing	No	No Chemicals of Potential Concern have been Detected in Hood Canal Nearshore Sediments
	Ingestion of Accumulated Chemicals in Fruits and Vegetables	No	Wild Fruit Exposure and Potential Garden-related Exposure Expected to be Negligible Compared with the Leakage Pathway
	Ingestion of Accumulated Chemicals in Meat from Wildlife	No	Meat Exposure is Expected to be Negligible Based on an Analysis of Transfer Coefficients (Travis and Arms, 1988)

Table 3 - Summary of Site A Exposure Factors

Exposure Factor	Units	Average Condition	RME Condition(a)
I. Dermal Absorption			
a) Surface Area:			
0 to 6 years	m2	0.12	0.12 (b)
6 to 18 years	m2	0.25	0.25 (b)
18 to 75 years	m2	0.30	0.30 (b)
b) Soil Adherence Factor	mg/cm2	0.60	0.90
c) Absorption:			
Metals	by wt.	0.1%	1.0%
Ordnance	by wt.	40%	80%
PCBs/phthalates	by wt.	4% (c)	10% (c)
d) Frequency:			
0 to 6 years	percent	96%	96% (b)
6 to 18 years	percent	14%	96%
18 to 75 years:			
SUBASE Worker	percent	24%	68%
Vinland Resident	percent	7%	96%
e) Duration:			
SUBASE Worker	years	10	25
Vinland Resident	years	9	30 (d)
f) Body Weight:			
0 to 6 years	kg	15	15 (b)
6 to 18 years	kg	43	43 (b)
18 to 75 years	kg	70	70 (b)
II. Soil Ingestion:			
a) Ingestion Route:			
0 to 6 years	gm/day	0.2	0.2 (b)
6 to 18 years	gm/day	0.1	0.1 (b)
18 to 75 years:			
SUBASE Worker	gm/day	0.05	0.05 (b)
Vinland Resident	gm/day	0.10	0.10 (b)
b) Absorption:			
Metals	by wt.	10% (c)	100%
Ordnance	by wt.	100%	100%
PCBs/phthalates	by wt.	50% (c)	100%
c) Frequency:			
0 to 6 years	percent	96%	96% (b)
6 to 18 years	percent	14%	96%
18 to 75 years:			
SUBASE Worker	percent	24%	68%
Vinland Resident	percent	7%	96%
d) Duration:			
SUBASE Worker	years	10	25
Vinland Resident	years	9	30 (d)

Table 3 – (Continued)

Exposure Factor	Units	Average Condition	RME Condition(a)
e) Body Weight:			
0 to 6 years	kg	15	15 (b)
6 to 18 years	kg	43	43 (b)
18 to 75 years	kg	70	70 (b)
III. Dust and Vapor Inhalation:			
a) Ventilation Rate:			
18 to 75 years	m3/day	20	20 (b)
b) Absorption:			
Dust	by wt.	40% (c)	100%
Vapors	by wt.	100%	100%
c) Frequency:			
SUBASE Bangor Worker	percent	24%	68%
Vinland Resident	percent	96%	96% (b)
d) Duration:			
SUBASE Worker	years	10	25
Vinland Resident	years	9	30
e) Body Weight:			
18 to 75 years	kg	70	70 (b)
IV. Drinking Water:			
a) Consumption Rate:			
18 to 75 years	liters/day	1.4	2.0
b) Absorption	by wt.	100%	100%
c) Frequency:			
Vinland Resident	hr/day	96%	96% (b)
d) Duration:			
Vinland Resident	years	9	30
e) Body Weight:			
18 to 75 years	kg	70	70 (b)

NOTES:

a) Exposure factors used to compute the reasonable maximum exposure (RME) scenario were based on EPA guidelines. Average conditions were utilized in a subsequent assessment of uncertainty.

b) Based on EPA guideline the average and RME values for these exposure factors are equivalent.

c) These exposure factors deviate from EPA Region 10 Guidelines, but are consistent with the scientific literature specific to these chemicals.

d) Including exposure during ages 0 to 6 years, with the remaining 24 years evaluated under adult exposure conditions.

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Table 4. Summary of Site A Burn Area Baseline Risk Assessment; Reasonable Maximum Exposure Scenario

Chemical of Potential Concern	Exposure Concentration (a) Soil (mg/kg)	Air (ug/m3)	Water (ug/L)	Chronic Daily Intake in mg/kg-day Direct Contact	Air Inhalation	Drinking Water	Reference Dose in mg/kg-day Oral	Inhal.	Cancer Potency in (mg/kg-day)-1 Oral	Inhal.	Hazard Quotient	Lifetime Cancer Risk
METALS:												
Barium (and compounds)	-	-	-	-	-	-	7E-02 (b)	1E-04 (c)	-	-	-	-
Cadmium (and compounds)	3E+00 U	3E-06 U	1E+00 U	2E-07	1E-10	1E-05	5E-04 (b)	5E-04 (e)	-	6E+00 (b)	0.01	7E-10
Chromium (and compounds)	3E+01	4E-05	3E+00 U	1E-05	2E-08	4E-05	5E-03 (b)	6E-07 (c)	-	4E+01 (b)	0.04	5E-07
Copper (and compounds)	3E+01	3E-05	8E+00	1E-05	1E-08	1E-04	4E-02 (c)	1E-02 (c)	-	-	< 0.01	-
Lead (and compounds)	5E+01	5E-05	1E+01	2E-05	2E-08	2E-04	1E-03 (c)	4E-04 (c)	-	-	0.10	-
Nickel (and compounds)	4E+01	5E-05	5E+00 U	1E-05	2E-08	7E-05	2E-02 (b)	2E-02 (e)	-	8E-01 (b)	< 0.01	1E-08
Zinc (and compounds)	1E+02	1E-04	3E+00 B	4E-05	5E-08	4E-05	2E-01 (c)	1E-02 (c)	-	-	< 0.01	-
ORDNANCE COMPOUNDS:												
2,4,6-Trinitrotoluene (2,4,6-TNT)	6E+02	6E-04	6E-01 U	2E-03	5E-05	8E-06	5E-04 (b)	5E-04 (e)	3E-02 (b)	3E-02 (e)	4.00	4E-05
2,4-Dinitrotoluene (2,4-DNT)	1E+01	8E-06	5E-02 U	3E-05	3E-07	7E-07	-	-	7E-01 (b)	7E-01 (e)	-	2E-05
2,6-Dinitrotoluene (2,6-DNT)	6E+00	1E-06	5E-02 U	2E-05	7E-07	7E-07	-	-	7E-01 (b)	7E-01 (e)	-	1E-05
1,3,5-Trinitrobenzene (1,3,5-TNB)	2E-01 U	2E-06 U	4E-01 U	5E-07	2E-08	6E-06	5E-05 (b)	5E-05 (e)	-	-	0.10	-
1,3-Dinitrobenzene (1,3-DNB)	1E-01	8E-08	5E-01 U	3E-07	1E-07	7E-06	1E-04 (b)	1E-04 (e)	-	-	0.08	-
Nitrobenzene (NB)	6E-02	1E-08	4E-01 U	2E-07	7E-07	6E-06	5E-04 (b)	5E-04 (b)	-	-	0.01	-
Hexahydro-1,3,5---- (RDX)	1E+01	2E-06	2E+02 J	5E-05	4E-06	3E-03	3E-03 (b)	3E-03 (e)	1E-01 (b)	1E-01 (e)	0.90	2E-04
2,4,6-Trinitrophenol (Picric Acid)	9E-02	1E-07	5E-01 U	3E-07	6E-11	7E-06	4E-02 (c)	4E-02 (e)	-	-	< 0.01	-
2-Amino-4,6---- (Picramic Acid)	1E+00	1E-06	3E+00 U	4E-06	5E-10	4E-05	3E-02 (c)	3E-02 (e)	-	-	< 0.01	-
1,2-Propanediol----(Otto Fuel)	5E-02 J	6E-09 J	1E-01 U	1E-07	5E-11	1E-06	6E-04 (d)	6E-04 (d)	-	-	< 0.01	-
N-Methyl-N-2,4,6---- (Tetryl)	8E-02	9E-08	3E-01 U	2E-07	7E-11	4E-06	2E-03 (d)	2E-03 (d)	-	-	< 0.01	-
BASE-NEUTRAL EXTRACTABLES:												
Bis(2-ethylhexyl)phthalate	2E+00 U	4E-06 U	3E+01 B	4E-06	3E-09	4E-04	2E-02 (b)	2E-02 (e)	1E-02 (b)	1E-02 (e)	< 0.02	4E-06
Butylbenzylphthalate	1E-01 U	5E-07 U	1E+00 U	2E-07	3E-09	1E-05	2E-01 (b)	2E-01 (e)	-	-	< 0.01	-
Di-n-butyl phthalate	1E+00	1E-06	1E+00 U	1E-07	2E-08	1E-06	1E-01 (b)	1E-01 (e)	-	-	< 0.01	-
Di-n-octyl phthalate	1E-01 U	5E-07 U	1E+00 U	2E-07	3E-09	1E-05	1E-01 (c)	1E-01 (e)	-	-	< 0.01	-
Total PCBs	4E-02	9E-08	0E+00 U	6E-08	1E-08	0E+00	-	-	8E+00 (b)	8E+00 (e)	-	4E-07
											5.00	3E-04

NOTES:

a. Soil, air, and water concentrations computed as the upper 95% confidence limit. Non-detects equal to one-half the detection limit.

b. Verified reference dose or cancer potency slope, as documented in EPA-IRIS (March 1991 accession).

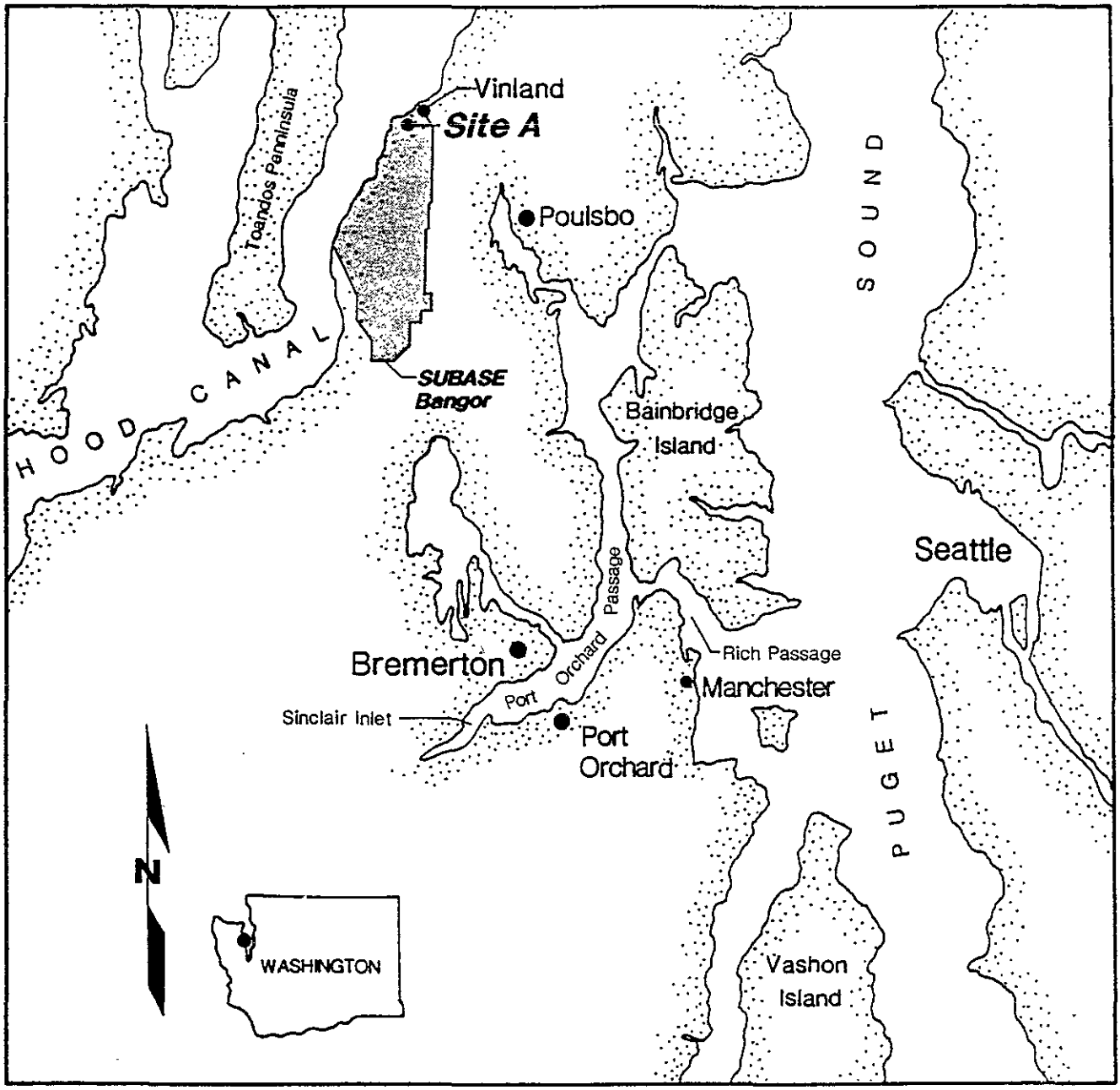
c. Reference dose or cancer potency slope, as documented in EPA-HEAST (1990 accession) or EPA-SPHEM (1986).

d. Reference dose determined by the U.S. Army Medical Bioengineering Research and Development Laboratory (1981).

e. The oral value was assumed to be adequate to address inhalation exposures.

2830T4.wk1

Generalized Regional Map



Note: Base map prepared from "Puget Sound Country Washington" published by Kroll Map Company, undated.

0 4 8

Scale in Miles

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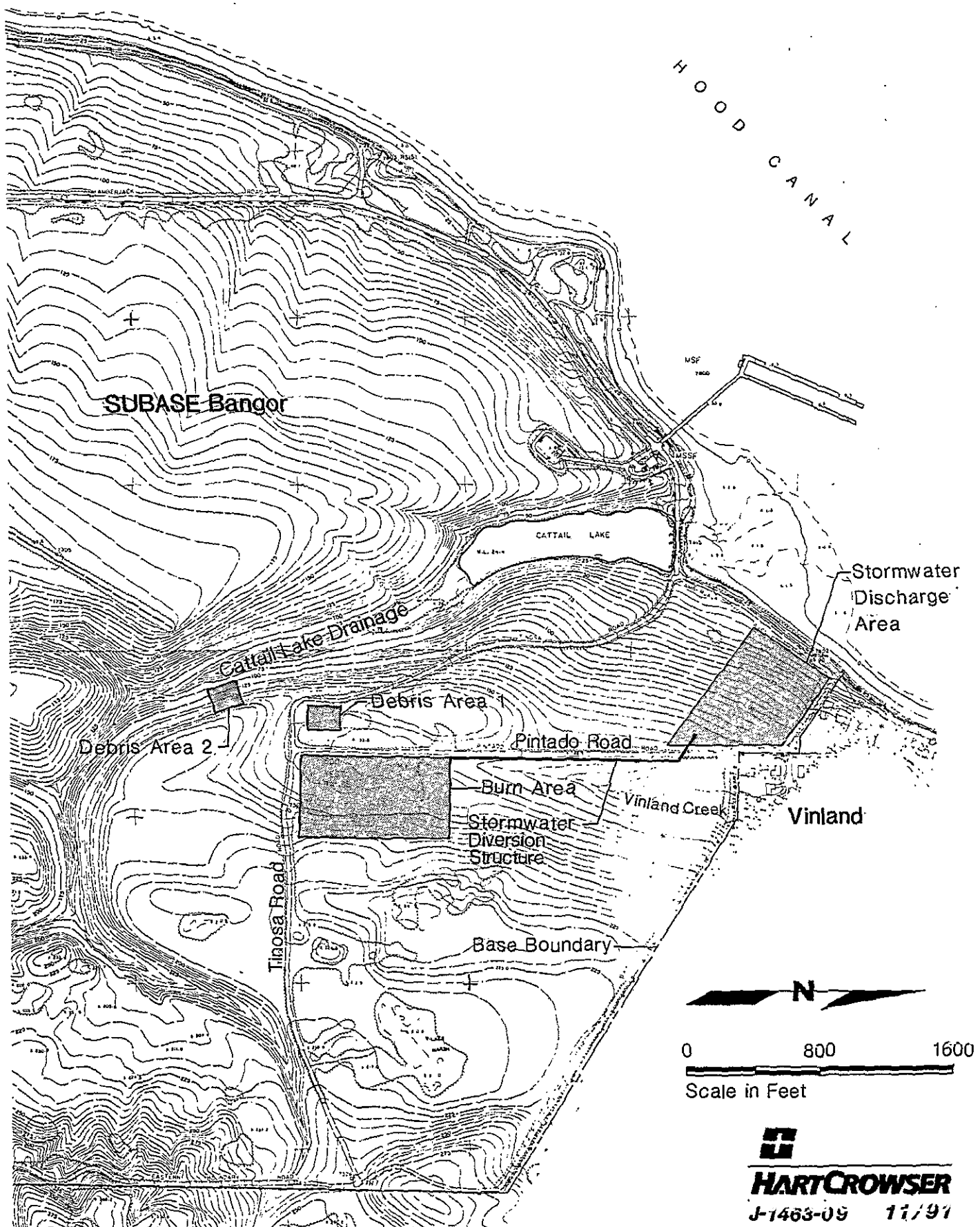
J-1463-09 11/91

Figure 1

Site A Vicinity Map



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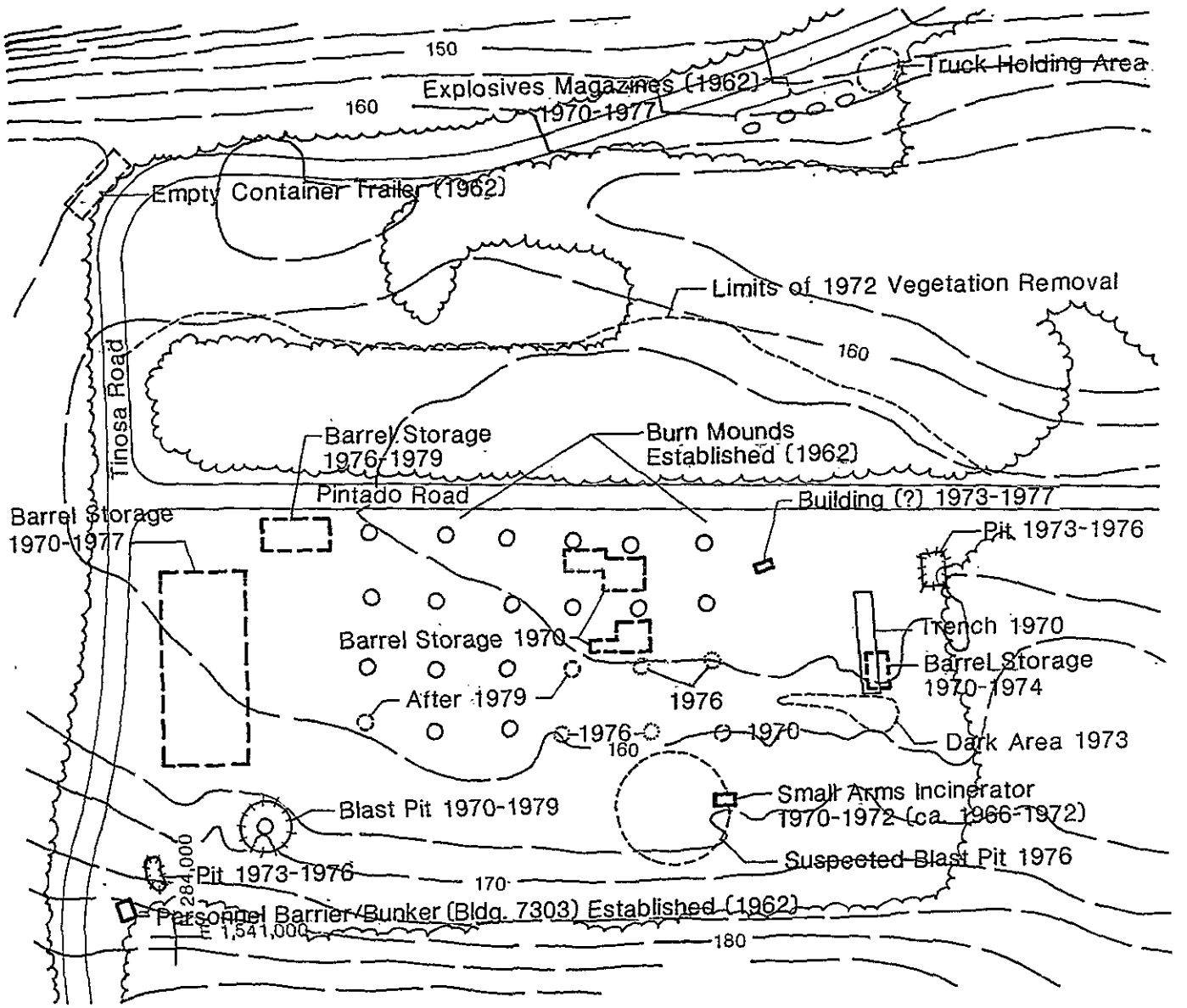
J-1463-09 11/97

Figure 2

Site A Historical Features



Note: Compiled from aerial photographs (1965, 1970, 1972-74, 1976-77, 1979, 1986) and historical sources.

(1962) Historical Source

1970 Observed on Available Aerial Photos

○-1970 Approximate Removal Date of Burn Mound

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J-1463-06 11/91

Figure 3

Surficial Soil TNT Concentration Contour Map

Site A Burn Area

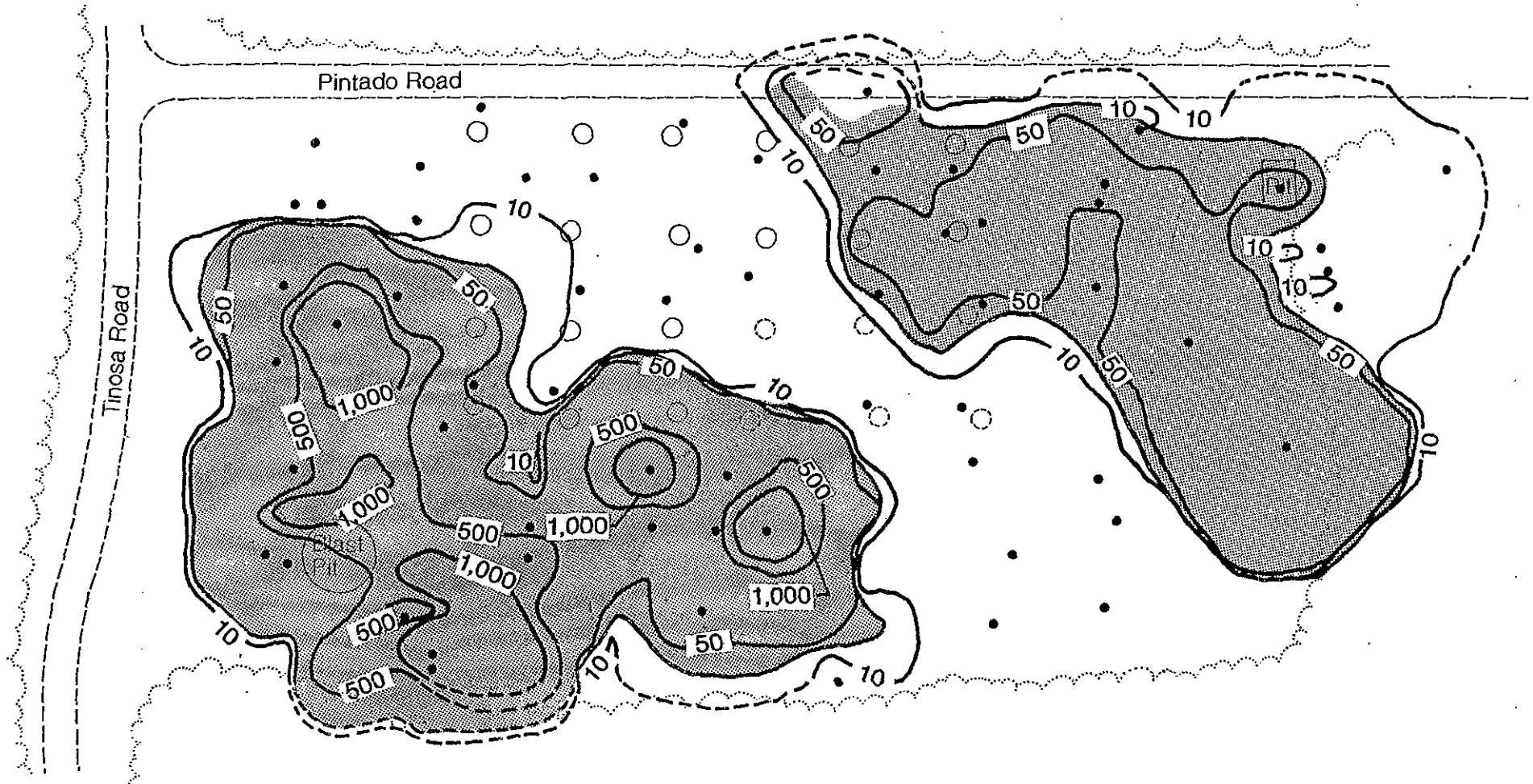

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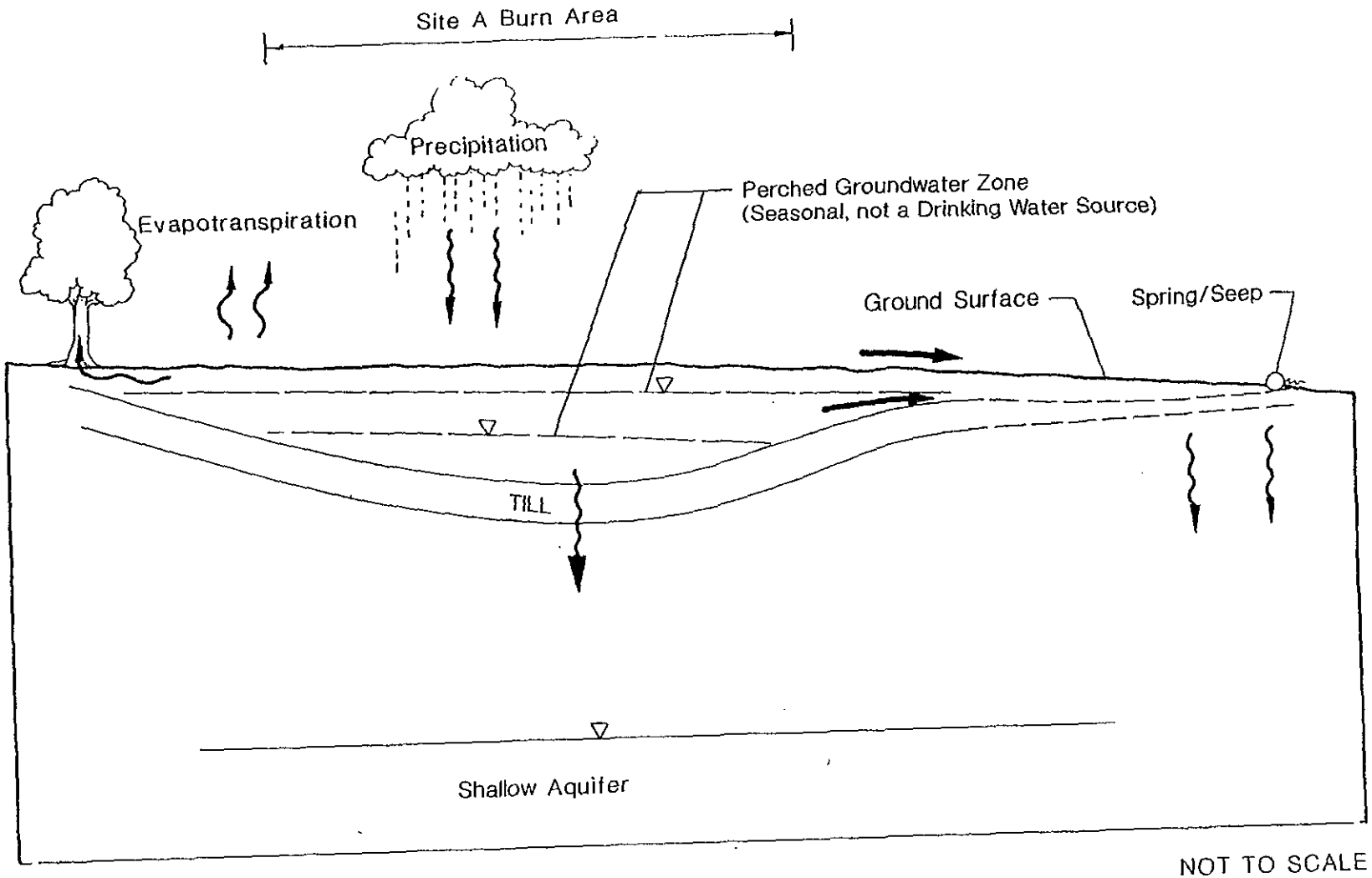
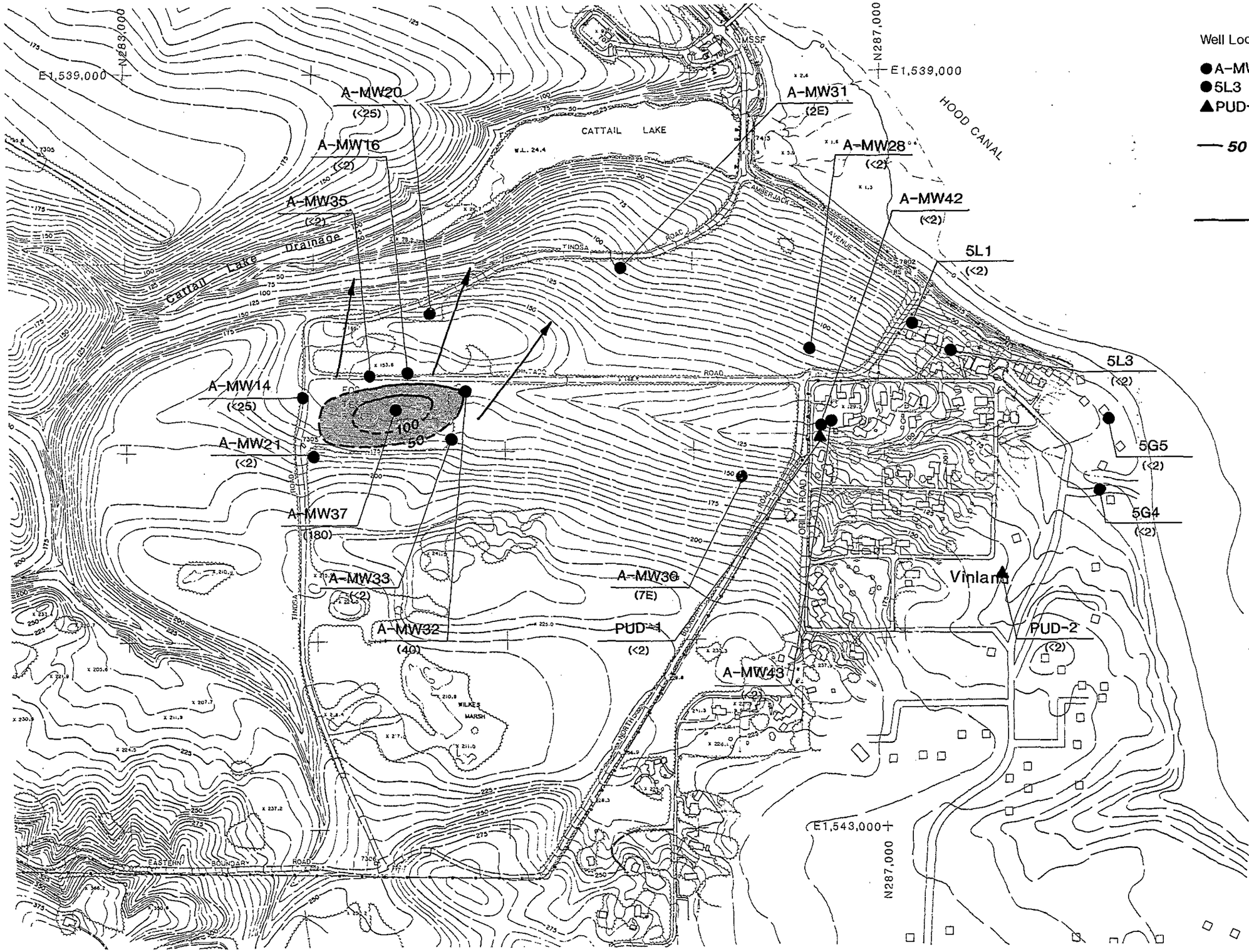
Figure 4

Conceptualized Flow Model of Perched Groundwater Zone



HARTCROWSER
J-1463-09 11/91
Figure 5

RDX Concentration Contours within the Shallow Aquifer



Well Location and Number

- ● A-MW31 Monitoring
- ● 5L3 Domestic
- ▲ PUD-2 Public Water System

— 50 — RDX Concentration Contour in µg/L (Based on linear interpolation)

→ Approximate Groundwater Flow and Direction

Note: Groundwater samples in PUD-1 and PUD-2 are from the Sea Level Aquifer.

0 500 1000

Scale in Feet

N

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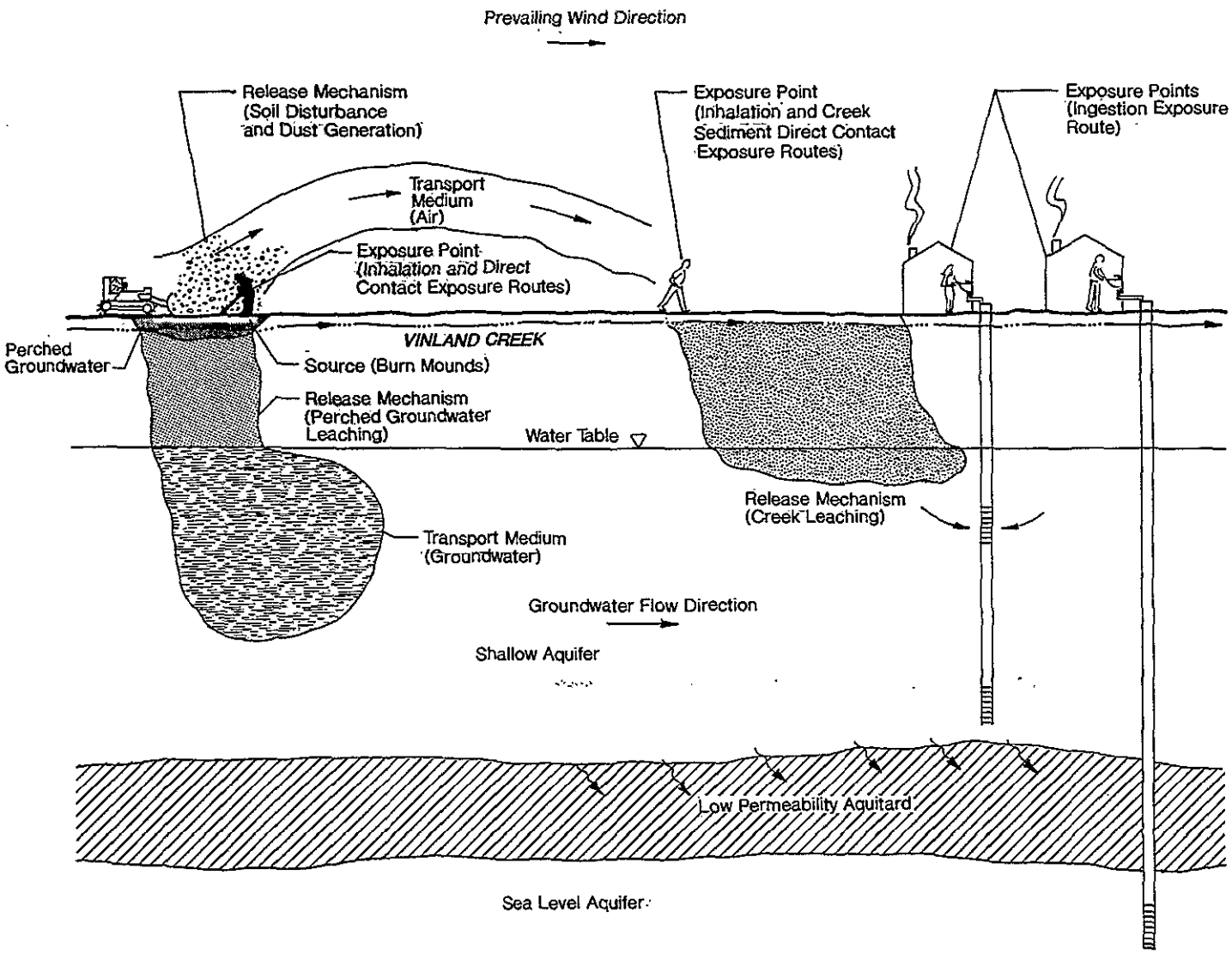
Figure 6

Baseline Exposure Pathways
Hypothetical Conditions



NOT TO SCALE

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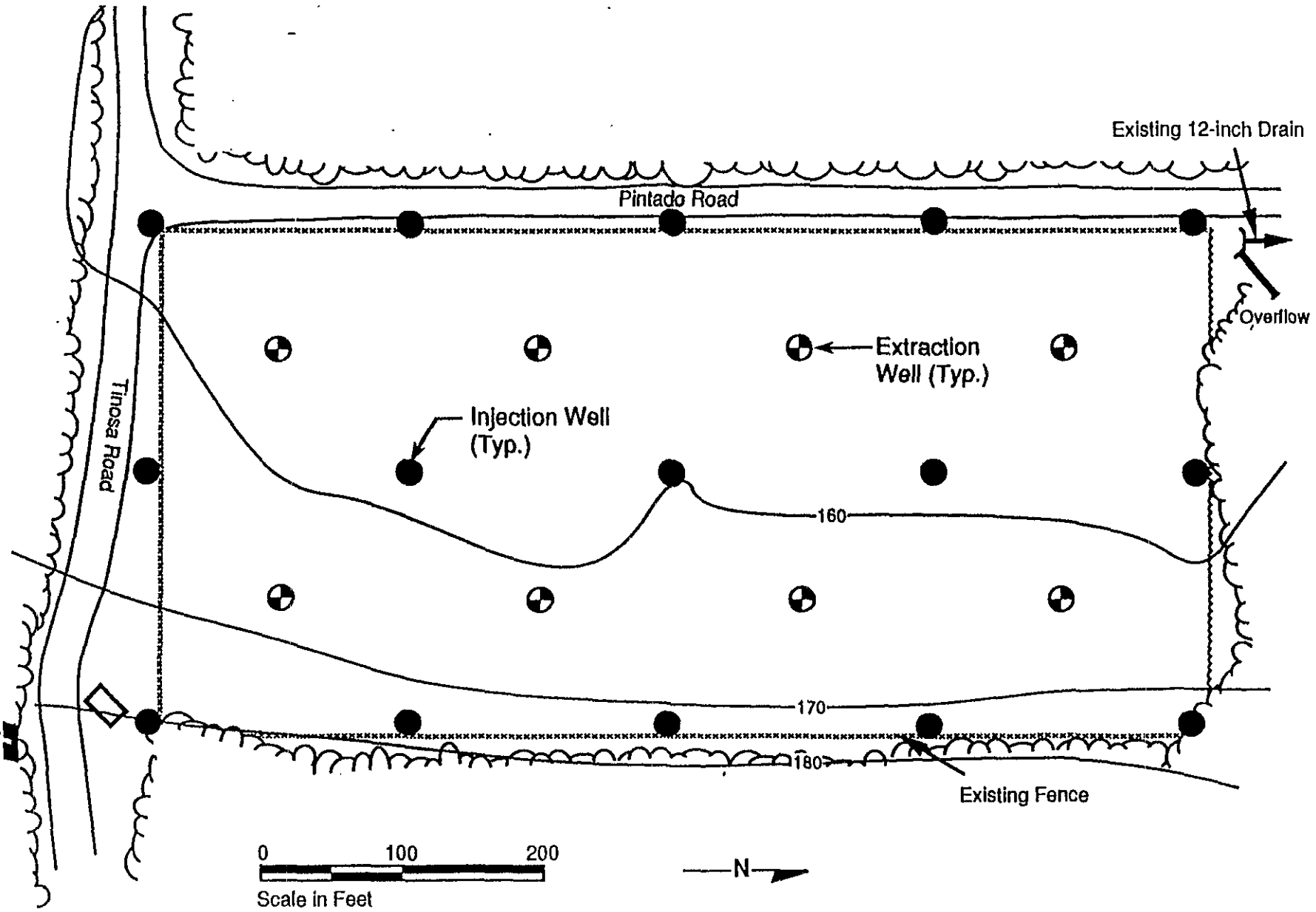
J-1463-09 11/91

Figure 7

Site A

Conceptual Well Layout, Groundwater Extraction and Reintroduction



HARTCROWSER

J-1463-09 11/91

Figure 8

ATTACHMENT A

RESPONSIVENESS SUMMARY

ATTACHMENT A
RESPONSIVENESS SUMMARY

OVERVIEW

Site A, a former explosive ordnance detonation and disposal site located at SUBASE, Bangor, was listed on the National Priorities List (NPL) of hazardous waste sites by the Environmental Protection Agency, in 1987. SUBASE, Bangor is located in Kitsap County, Washington, on Hood Canal approximately 10 miles north of Bremerton. Site A, located in the northwest portion of SUBASE, Bangor, is an upland site totaling approximately 12 acres in area. It is situated approximately 2,000 feet south of Vinland, a residential community of several hundred persons.

Site A is composed of a Burn Area, two Debris Areas, and a Stormwater Discharge Area. The Burn Area was used to detonate and incinerate various ordnance materials, including trinitrotoluene (TNT), flares, fuses, primers, smoke pots, smokeless powder, and black powder. Inert solid waste material (e.g., metal casings) from the Burn Area operations was deposited at the two adjacent Debris Areas. The Stormwater Discharge Area has received surface water runoff from the Burn Area since a diversion structure was completed in 1983. As a result of these activities, soil and groundwater within various areas of Site A have been impacted by different types of ordnance compounds, their breakdown products, and metals.

A final Remedial Investigation and Feasibility Study has been completed at Site A. A final remedial action is proposed to minimize potential future health risks associated with soil and groundwater contamination.

This **Responsiveness Summary** addresses public comments on the Proposed Plan for Remedial Action at Site A. These comments were raised at a public meeting held on August 21, 1991, in Poulsbo, Washington, at the Breidablik Hall.

SUMMARY OF PUBLIC COMMENTS

A total of eight comments were received by the Navy concerning the Proposed Plan, including both written and oral questions or statements. All the comments were discussed at the public meeting with the opportunity for clarification and additional remarks. The comments raised and the responses provided at the public meeting were recorded in a Verbatim Report of Public Meeting, which is available in the information repositories.

There were no comments received by the Navy on the Proposed Plan outside of the public meeting, during the remainder of the public comment period which opened on August 14,

1991, and closed on September 12, 1991. Many of the written comments requested clarification or raised questions on more than one issue and most pertained to similar issues about the Proposed Plan and contamination studies at Site A. The comments regarding similar concerns or questions are grouped accordingly and addressed in this document by topic area.

There were a number of questions raised on the effectiveness of the soil washing and leachate treatment (Ultraviolet [UV]/Oxidation) process. The questions concerned whether the soil washing would be effective on some of the ordnance compounds which are not highly soluble and whether the UV/Oxidation system had been successfully used to treat ordnance in the past.

Other comment topics included:

- Have residential wells been sampled (including Olympic View wells) and will the Navy test groundwater samples provided by residents?
- Would increased pumping of residential water supply wells in Vinland affect the movement of groundwater contaminants?
- How extensive have the sediments of Hood Canal and Cattail Lake been tested and what shellfish were tested?
- Has there been any long-term health studies of off-base residents to assess exposure to possible air-borne contaminants?
- What is the schedule for implementation of the remedial action?

Responses to these comments are presented below. Copies of the transcripts for the meeting are available at all the public repositories listed in the Community Participation section of the Record of Decision and a copy is also included in the Administrative Record.

RESPONSE TO COMMENTS

The comments were grouped into six topics which address the issues raised at the public meeting. Each of these topics are discussed separately below.

1. Effectiveness of Remedial Action Components

Summary of Comment

There were a number of questions raised on the effectiveness of the soil washing and leachate treatment (UV/Oxidation) process. The questions concerned whether the soil washing would be effective on some of the ordnance compounds which are not as soluble as RDX, whether the UV/Oxidation system had been successfully used to treat ordnance in the past, and whether the breakdown products still pose a problem.

Response

Chemical characteristics of TNT, RDX, and the other ordnance compounds detected at Site A make these substances amenable to soil leaching. Effective leaching of TNT from local soils has been demonstrated in an extensive bench-scale experiment performed at a similar site at SUBASE, Bangor. Soil leaching of both TNT and RDX has also been verified in more limited experiments performed at Site A. RDX is more soluble than TNT and has desorbed from the surface soils at the Burn Area. The soil washing system will greatly enhance the flushing of water through the contaminated soils and allow other slightly less soluble ordnance compounds to be removed. However passive soil washing is not effective in treating less soluble contaminants such as lead. For this reason, soil washing is not being proposed to treat soils from Debris Area 2.

Oxidation processes have been used in the chemical process industry for over one hundred years. Strong oxidants employed for such processes as bleaching include halogens (chlorine, fluorine, bromine), permanganate, oxygen, ozone, and hydrogen peroxide. Wastewater treatment has been successful using these oxidants. However, treatment of organics such as ordnance compounds using these conventional oxidants alone has had only limited success. Likewise, ultraviolet light (UV) has been used for many years for disinfection of drinking water, but when used alone for treating organics it has technical and economic limitations.

During the past fifteen years, combined use of UV with strong oxidants such as ozone and hydrogen peroxide has developed into a successful technology for treating organics in industrial wastewater. UV-catalyzed oxidation, or UV/Oxidation has also been successfully applied to treatment of groundwater contaminants including ordnance compounds. Successful application of enhanced UV/Oxidation has included treatment of wastewaters containing explosives (DNT) at a large Canadian explosives manufacturing facility, and treatment of wastewater containing ordnance for the U.S. Navy at Indian Head, Maryland.

The basis of enhanced oxidation is the use of UV light and an oxidant source such as ozone or hydrogen peroxide to generate the hydroxyl radical. This hydroxyl radical will aggressively attack and break down complex organic compounds (such as ordnance) by

initiating a series of oxidative reactions, converting them into components such as carbon dioxide, water, and nitrate.

The technology has been shown to be effective on munitions; however, the application at Site A requires treatment of very low levels of ordnance. A treatability study is currently underway to tailor the UV/Oxidation technology for Site A and verify that the treatment system is effective in removing all potential chemical toxicants. If the UV/Oxidation process cannot achieve treatment levels down to the desired criteria due either to technological or economic reasons then an on-site polishing treatment will be used to complete the treatment process.

2. Groundwater Sampling of Off-Base Residential Wells

Summary of Comment

A question was raised whether off-base residential wells in Olympic View had ever been tested for contaminants, including lead. In addition, would the Navy test water samples from residential wells if delivered to the Navy?

Response

Select residential wells in Vinland were tested as part of the completed remedial investigation and feasibility study (RI/FS) and monitoring conducted by the State Department of Health. No ordnance was detected in these samples. The groundwater samples were also tested for lead along with other metals. The lead concentrations were at or below background levels for the area and not found to be of concern. The groundwater contamination identified at Site A in the Shallow Aquifer is of limited extent. It is generally contained within the boundary of the Burn Area. The groundwater flow in the Shallow Aquifer is generally toward the west-northwest direction and is moving very slowly because of the fine-grained nature of the aquifer.

Olympic View is located approximately two miles south of Site A and based on the findings of the RI/FS investigation, the groundwater at Olympic View is not impacted by Site A. There is a potential for groundwater concern in Olympic View and Bangor associated with another former waste disposal site on base known as Site F. However, an interim remedial action is planned for Site F to minimize the further spread of groundwater contamination from that site.

One of the questioners asked whether the Navy would test water samples from residential wells supplied by the owner. The Navy and the State Department of Health have conducted groundwater sampling of off-base residential wells as part of the contamination investigations. This testing was initiated in 1984. No groundwater contamination has been identified in residential wells during the course of this monitoring. The data collected to

date indicates no impacts or current risk to the water supply wells in the adjacent residential communities. A large number of water supply wells located in Vinland and Olympic View are completed in aquifers below the Shallow Aquifer which have not been impacted by contamination associated with the former waste sites.

The Navy will continue, when appropriate, to test groundwater samples from off-base residential wells as part of the effort to remediate former waste disposal sites. However, if private citizens desire to have their wells tested, the Navy will not pay for this testing.

3. Effect of Pumping Residential Wells on the Movement of Groundwater Contamination

Comment

The question was asked regarding the movement of groundwater contaminants at Site A (increased flow rate or change of direction) if the pumping of residential wells in Vinland were increased.

Response

The groundwater flow in the Shallow Aquifer is relatively slow because of the fine-grained nature of the aquifer. There are a number of wells in Vinland which are completed in the Shallow Aquifer. The aquifer is not very productive and consequently the maximum yield from these wells is small. The groundwater flow rate at the Burn Area is on the order of 10 to 40 feet per year, thus requiring 15 to 50 years to flow approximately 500 feet across the Burn Area.

The pumping of adjacent wells in an aquifer can influence the rate and direction of groundwater flow. However because the Shallow Aquifer is composed of fine-grained material, the radius of influence associated with pumping a residential well is limited. The wells in Vinland are located approximately one-half mile from the Burn Area, and not in the direction of groundwater flow from contaminated areas of the site.

The groundwater treatment system proposed for Site A consists of extracting contaminated groundwater and reinjecting treated water. The extraction will take place at approximately 8 wells, all pumping at low rates. The groundwater remediation system will be, in effect, self-contained and will limit the further migration of contaminants from the site.

4. Sampling of Sediments and Shellfish

Comment

Questions were raised on the location and the number of sediment samples collected as part of the RI/FS investigation. Similar questions also concerned shellfish and fish sampling along Hood Canal and in Cattail Lake.

Response

Sediment sampling was conducted along Hood Canal near the discharge of Cattail Lake. This area receives discharges from Site A including shallow interflow from the Stormwater Discharge Area. Sediment samples were also collected in Cattail Lake and Vinland Creek which may have also received waste discharges from the Debris Areas or the Burn Area.

The Hood Canal sediments were analyzed for metals and ordnance compounds. In these samples, all concentrations were comparable to natural background values. Cattail Lake sediments were analyzed for metals, ordnance compounds, and pesticides and PCBs. Metals were detected in the samples, but at low concentrations relative to reference values. No ordnance compounds were detected in these sediment samples. Vinland Creek sediment samples were also analyzed for ordnance compounds. One sample collected at the SUBASE property boundary contained 2,4-dinitrotoluene at the limit of detection.

Tissue samples of fish (cutthroat trout) from Cattail Lake and shellfish (clams and oysters) from Hood Canal were sampled. The shellfish were harvested on Hood Canal near the discharge point of Cattail Lake. The shellfish included littleneck clams, butter clams, horse clams, and oysters.

The fish and shellfish were analyzed for metals, semivolatiles organics, ordnance compounds, and lipids. Concentrations of all analytes in the fish were equivalent to reference concentrations. No ordnance compounds were confirmed to be present in these samples.

5. Long-term Health Studies of Vinland Residents

Comment

A concern was raised regarding the potential for health impacts to Vinland residents which may have occurred as a result of air-borne contaminants from smoke generated during burning operations when Site A was active. It was asked whether any long-term health studies of residents in Vinland have been conducted.

Response

There have been no long-term health studies of residents in Vinland.

6. Schedule of the Remedial Action

Comment

A question was raised on the timeline of the remedial action at Site A.

Response

The selected remedial action at Site A consists of several components including soil and groundwater treatment. A treatability study is currently underway to verify the effectiveness of the ultraviolet/oxidation treatment process for use at Site A. The treatability study is expected to take approximately 9 months and will be completed in the spring or early summer of 1992.

The soil washing system will be the first remedial action taken at the site. The soil treatment is estimated to take 1 year to complete. The groundwater treatment system will be implemented following completion of soil washing and is anticipated to take approximately 10 years.

ATTACHMENT B

ADMINISTRATIVE RECORD INDEX

ATTACHMENT B
ADMINISTRATIVE RECORD INDEX

The Administrative Record Index contains a reference listing of documents for the Site A RI/FS and Remedial Action.

ID #: 313

SUB-HEAD: 01.1 CORRESPONDENCE
TITLE: FORWARDS PRELIMINARY ASSESSMENTS TO ENVIRONMENTAL PROTECTION AGENCY

DATE: 4/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.1-OU1-1 TYPE: LETTER
AUTHOR: CAPT D.D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: RANDALL SMITH
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 318

SUB-HEAD: 01.2 BACKGROUND
TITLE: QUARTERLY STATUS SUMMARY ON ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS (ACIP) PROGRAM

DATE: 11/17/80 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-1 TYPE: FINAL REPORT
AUTHOR: V.L. VASAITIS
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NORTHWEST

ADDRESSEE: COMMANDER
ADDRESSEE'S ORG: NAVAL FACILITIES ENGINEERING COMMAND

****

ID #: 319

SUB-HEAD: 01.2 BACKGROUND
TITLE: GROUNDWATER HYDROLOGY AT SUBASE BANGOR VOL 2 TECHNICAL APPEDICES

DATE: 7/81 # OF PAGES: 188 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-2 TYPE: FINAL REPORT
AUTHOR: WALTER D. PATERSON
AUTHOR'S ORG: ROBINSON, NOBLE & CARR, INC.

ADDRESSEE: UNKNOWN
ADDRESSEE'S ORG: UNKNOWN

****

ID #: 320
SUB-HEAD: 01.2 BACKGROUND
TITLE: ANNUAL SUMMARY REPORT OF NAVY ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS (NACIP) PROGRAM AT NAVAL SUBMARINE BASE, BANGOR
DATE: 6/83 # OF PAGES: 169 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-3 TYPE: FINAL REPORT
AUTHOR: R.R. SPENCER
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR
ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 321
SUB-HEAD: 01.2 BACKGROUND
TITLE: NAVY ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS: INITIAL ASSESSMENT STUDY OF NAVSUBASE BANGOR, BREMERTON, WA, VOL. I,
DATE: 6/83 # OF PAGES: 414 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-4 TYPE: FINAL REPORT
AUTHOR: JEFFERY HEATH, et. al.
AUTHOR'S ORG: NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY, PORT HUENEME, CA 93043
ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 635
SUB-HEAD: 01.2 BACKGROUND
TITLE: VERIFICATION STUDY GENERAL SAFETY PLAN

DATE: 1/7/85 # OF PAGES: 102 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-4 TYPE: REPORT
AUTHOR: HART-CROWSER
AUTHOR'S ORG:
ADDRESSEE: EFA, NW
ADDRESSEE'S ORG:

****

ID #: 5
SUB-HEAD: 01.2 BACKGROUND
TITLE: NAVY ASSESSMENT AND CONTROL OF INSTALLATION POLUTANTS: INITIAL ASSESSMENT STUDY VOL 2

DATE: 6/83 # OF PAGES: 192 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-5 TYPE: REPORT
AUTHOR: NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY
AUTHOR'S ORG: PORT HUENEME CA
ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 634
SUB-HEAD: 01.2 BACKGROUND
TITLE: VERIFICATION STUDY QUALITY ASSURANCE PLAN

DATE: 1/7/85 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-5 TYPE: REPORT
AUTHOR: HART-CROWSER
AUTHOR'S ORG:

ADDRESSEE: EFA, NW
ADDRESSEE'S ORG:

****

ID #: 322
SUB-HEAD: 01.2 BACKGROUND
TITLE: SUBASE BANGOR AND NSCPS MANCHESTER CONFIRMATION STUDY: VERIFICATION/CHARACTERIZATION STUDY PLAN OF ACTION

DATE: 11/86 # OF PAGES: 48 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-6 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.; HARPER-OWES; TETRA TECH, INC

ADDRESSEE: JOHN GORDON
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 323
SUB-HEAD: 01.2 BACKGROUND
TITLE: SUBASE BANGOR AND NSCPS MANCHESTER CONFIRMATION STUDY: FIELD SAMPLING PROCEDURES

DATE: 12/86 # OF PAGES: 29 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-7 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.; HARPER-OWES; TETRA TECH, INC.

ADDRESSEE: JOHN GORDON
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 324
SUB-HEAD: 01.2 BACKGROUND
TITLE: SUBASE BANGOR & NSCPS MANCHESTER CONFIRMATION STUDY: ANALYTICAL LABORATORY PROCEDURES

DATE: 87 # OF PAGES: 38 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-8 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.

ADDRESSEE: JOHN GORDON
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 325
SUB-HEAD: 01.2 BACKGROUND
TITLE: NATURAL RESOURCES MANAGEMENT PLAN FOR THE NAVAL SUBMARINE BASE, BANGOR, BREMERTON, WASHINGTON

DATE: 4/88 # OF PAGES: 191 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.2-OU1-9 TYPE: FINAL REPORT
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE BANGOR, WA

****

ID #: 48
SUB-HEAD: 01.5 SI REPORT
TITLE: CURRENT SITUATION REPORT SITE A VOL 1

DATE: 4/1/88 # OF PAGES: 160 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.5-OU1-1 TYPE: REPORT
AUTHOR:
AUTHOR'S ORG: HART CROWSER

ADDRESSEE:
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY

****

ID #: 329
SUB-HEAD: 01.5 SI REPORT
TITLE: CURRENT SITUATION REPORT, SITE A, NAVSUBASE BANGOR, VOL. II, APPENDICES

DATE: 4/1/88 # OF PAGES: 350 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.5-OU1-2 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 328
SUB-HEAD: 01.5 SI REPORT
TITLE: TECHNICAL MEMO: SITE A ADJUNCT SITES, SUBASE BANGOR

DATE: 2/1/89 # OF PAGES: 16 OPERABLE UNIT: 1
DOCUMENT NUMBER: 1.5-OU1-3 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 432

SUB-HEAD: 10.1 COMMENTS AND REPSONSES
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A FACT SHEET OF FEBRUARY 1989

DATE: 4/24/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.1-OU1-1 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 433

SUB-HEAD: 10.1 COMMENTS AND REPSONSES
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON FACT SHEET #3

DATE: 11/21/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.1-OU1-2 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 434

SUB-HEAD: 10.1 COMMENTS AND REPSONSES
TITLE: RESPONSE TO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON FACT SHEET #3

DATE: 12/19/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.1-OU1-3 TYPE: LETTER
AUTHOR: V.L. VASAITIS
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 620

SUB-HEAD: 10.1 COMMENTS AND REPSONSES
TITLE: PUBLIC MEETING AUT 21, 91

DATE: 8/21/91 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.1-OU1-4 TYPE: REPORT
AUTHOR:
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 628
SUB-HEAD: 10.11 NEWSPAPER/JOURNAL ARTICLE
TITLE: INVITATION FOR PUBLIC COMMENTS ON SITE A

DATE: 8/14/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.11-OU1-1 TYPE: NEWSPAPER ARTICLE
AUTHOR: PATRICIA KELLY
AUTHOR'S ORG: SUBASE

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 436
SUB-HEAD: 10.2 COMMUNITY RELATIONS PLAN
TITLE: COMMUNITY RELATIONS PLAN, NAVAL SUBMARINE BASE, BANGOR, SUPERFUND SITE A, SILVERDALE, WA

DATE: # OF PAGES: 28 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.2-OU1-1 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.; NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: EFA NW

****

ID #: 3
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: CHARTER NAVAL SUBMARINE BASE, BANGOR TECHNICAL REVIEW COMMITTEE

DATE: # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-1 TYPE: REPORT
AUTHOR:
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 446
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING NOTICE & AGENDA

DATE: 8/9/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-10 TYPE: FINAL MINUTES
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 445
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: AUGUST 9, 1988 TECHNICAL REVIEW COMMITTEE MEETING SUMMARY

DATE: 8/9/88 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-11 TYPE: SUMMARY
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 448
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING AGENDA

DATE: 4/4/89 # OF PAGES: 6 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-12 TYPE: AGENDA
AUTHOR: NONE
AUTHOR'S ORG: NONE

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 447
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: APRIL 4, 1989 TECHNICAL REVIEW COMMITTEE MEETING SUMMARY

DATE: 4/4/89 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-13 TYPE: SUMMARY
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 449
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-14 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB GOODMAN
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 450
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-15 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 451
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-16 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 452
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-17 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: ROB RUMMEL
ADDRESSEE'S ORG: NONE

****

ID #: 453
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-18 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

****

ID #: 454

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING ANNOUNCEMENT AND FORWARD TECHNICAL MEMORANDUM ON VINLAND SAMPLING

DATE: 11/3/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-19 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 459

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-20 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

****

ID #: 458

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-21 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: ROB RUMMEL
ADDRESSEE'S ORG: NONE

****

ID #: 457

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-22 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 456
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-23 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 455
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-24 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB GOODMAN
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 460
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A BASELINE RISK ASSESSMENT TO TECHNICAL REVIEW COMMITTEE

DATE: 11/13/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-25 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 465
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-26 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

****

ID #: 464
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-27 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: ROB RUMMEL
ADDRESSEE'S ORG: NONE

****

ID #: 463
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-28 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 462
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-29 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 439
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE INVITATION TO JOIN

DATE: 3/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-3 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: DR. WILLA FISHER
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 461
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-30 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB GOODMAN
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 466
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD REMEDIAL ACTION OBJECTIVES TO TECHNICAL REVIEW COMMITTEE (SITE A)

DATE: 11/20/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-31 TYPE: ROUTINE TRANSMITTAL
AUTHOR: JONATHAN ROGALSKY
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 468
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING AGENDA

DATE: 11/29/89 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-32 TYPE: AGENDA
AUTHOR: NONE
AUTHOR'S ORG: NONE

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 467
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: NOVEMBER 28, 1989 TECHNICAL REVIEW COMMITTEE MEETING SUMMARY

DATE: 11/28/89 # OF PAGES: 8 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-33 TYPE: SUMMARY
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 473
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A DRAFT FEASIBILITY STUDY & ANNOUNCE JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING

DATE: 12/19/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-34 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 472
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A DRAFT FEASIBILITY STUDY & ANNOUNCE JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING

DATE: 12/19/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-35 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

****

ID #: 471
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A DRAFT FEASIBILITY STUDY & ANNOUNCE JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING

DATE: 12/19/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-36 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPARTMENT

****

ID #: 469
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A DRAFT FEASIBILITY STUDY & ANNOUNCE JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING

DATE: 12/19/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-37 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB GOODMAN
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 470
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD SITE A DRAFT FEASIBILITY STUDY & ANNOUNCE JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING

DATE: 12/19/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-38 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 476
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING AGENDA

DATE: 1/19/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-39 TYPE: AGENDA
AUTHOR: NONE
AUTHOR'S ORG: NONE

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 440
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE INVITATION TO JOIN

DATE: 3/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-4 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: JOHN LITTLER
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 475
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: JANUARY 19, 1990 TECHNICAL REVIEW COMMITTEE MEETING SUMMARY

DATE: 1/19/90 # OF PAGES: 6 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-40 TYPE: SUMMARY
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 486
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-41 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: DON OLIVER
ADDRESSEE'S ORG: WASHINGTON STATE DEPT. OF HEALTH

****

ID #: 488
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-42 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: LEW CONSIGLIERI
ADDRESSEE'S ORG: NOAA

****

ID #: 489
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-43 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: PHYLIS MEYERS
ADDRESSEE'S ORG: SUQUAMISH TRIBES

****

ID #: 490
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-44 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

****

ID #: 491
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-45 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: TISH PARMENTER
ADDRESSEE'S ORG: POINT NO POINT TREATY COUNCIL

****

ID #: 492
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-46 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: VALLANA PICCOLO
ADDRESSEE'S ORG: PUGET SOUND WATER QUALITY AUTHORITY

****

ID #: 487
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-47 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: JOE MULDER
ADDRESSEE'S ORG: ATSDR

****

ID #: 485
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-48 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 484
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-49 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON KANE
ADDRESSEE'S ORG: US FISH & WILDLIFE SERVICE

****

ID #: 441
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE INVITATION TO JOIN

DATE: 3/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-5 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 483
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-50 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 498
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-51 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: LEW CONSIGLIERI
ADDRESSEE'S ORG: NOAA

****

ID #: 493
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-52 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CLYDE STRICKLIN
ADDRESSEE'S ORG: HOOD CANAL COORDINATING COUNCIL

****

ID #: 494
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-53 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON KANE
ADDRESSEE'S ORG: US FISH AND WILDLIFE SERVICE

****

ID #: 495
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-54 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON MILES
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPARTMENT

****

ID #: 496
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-55 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: DON OLIVER
ADDRESSEE'S ORG: WASHINGTON STATE DEPARTMENT OF HEALTH

****

ID #: 497

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-56 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: JOE MULDER
ADDRESSEE'S ORG: ATSDR

****

ID #: 499

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-57 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: PHYLIS MEYERS
ADDRESSEE'S ORG: SUQUAMISH TRIBES

****

ID #: 500

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-58 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUD #1 OF KITSAP COUNTY

****

ID #: 501

SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-59 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: TISH PARMENTER
ADDRESSEE'S ORG: POINT NO POINT TREATY COUNCIL

****

ID #: 442
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE INVITATION TO JOIN

DATE: 3/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-6 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: RANDALL SMITH
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 502
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-60 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: VALLANA PICCOLO
ADDRESSEE'S ORG: PUGET SOUND WATER QUALITY AUTHORITY

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ID #: 503
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: FORWARD COMMUNITY RELATIONS PLAN (BASE-WIDE) AND TRC MEETING AGENDA FOR APRIL 17, 1990

DATE: 4/3/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-61 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 505
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING AGENDA

DATE: 4/17/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-62 TYPE: AGENDA
AUTHOR: NONE
AUTHOR'S ORG: NONE

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 504
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: APRIL 17, 1990 TECHICAL REVIEW COMMITTEE MEETING SUMMARY

DATE: 4/17/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-63 TYPE: SUMMARY
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 443
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE INVITATION TO JOIN

DATE: 3/15/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-7 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: TED WRIGHT
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT #1 OF KITSAP COUNTY

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ID #: 444
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE MEETING AGENDA

DATE: 7/11/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-8 TYPE: AGENDA
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 78
SUB-HEAD: 10.3 TECHNICAL REVIEW COMMITT
TITLE: TECHNICAL REVIEW COMMITTEE (TRC) MEETING MINUTES

DATE: 7/14/88 # OF PAGES: 8 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.3-OU1-9 TYPE: MINUTES
AUTHOR:
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 621
SUB-HEAD: 10.5 PUBLIC MEETING TRANSCRIPT
TITLE: VERBATIM REPORT OF PUBLIC MEETING OF AUG 21, 91

DATE: 8/21/91 # OF PAGES: 60 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.5-OU1-1 TYPE: REPORT
AUTHOR:
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 555
SUB-HEAD: 10.7 FACT SHEETS AND PRESS REL
TITLE: SITE A FACT SHEET

DATE: 2/89 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 10.7-OU1-1 TYPE: FACT SHEET
AUTHOR: NONE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 556
SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: TOXICITY OF ORDNANCE WASTES IN AQUATIC ENVIRONMENTS

DATE: 1/30/76 # OF PAGES: 25 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-1 TYPE: ANNUAL SUMMARY OF RESEARCH
AUTHOR: L.H. DISALVO, ET.AL.
AUTHOR'S ORG: NAVAL BIOMEDICAL RESEARCH LABORATORY

ADDRESSEE: NONE
ADDRESSEE'S ORG: NAVAL MEDICAL RESEARCH & DEVELOPMENT COMMAND

****

ID #: 557
SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: ENVIRONMENTAL FATE STUDIES ON CERTAIN MUNITION WASTEWATER CONSTITUENTS FINAL REPORT, PHASE I - LITERATURE REVIEW

DATE: 3/80 # OF PAGES: 85 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-2 TYPE: FINAL REPORT
AUTHOR: RONALD SPANGGORD, et. al.
AUTHOR'S ORG: SRI INTERNATIONAL

ADDRESSEE: JESSE BARKLEY
ADDRESSEE'S ORG: US ARMY MEDICAL RESEARCH & DEVELOPMENT COMMAND

****

ID #: 559

SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: MEMORANDUM FOR RECORD: ENVIRONMENTAL FATE OF MUNITION COMPOUNDS

DATE: 3/24/83 # OF PAGES: 13 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-3 TYPE: FINAL MEMORANDUM
AUTHOR: ANDY ANDERSON
AUTHOR'S ORG: USATHAMA

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 560

SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: BIOCONCENTRATION, ELIMINATION, AND METABOLISM OF PICRIC AND PICRAMIC ACID IN FRESHWATER FISH AND ESTUARINE DIVALVES

DATE: 4/83 # OF PAGES: 131 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-4 TYPE: FINAL REPORT
AUTHOR: DENNIS T. BURTON, PhD
AUTHOR'S ORG: JOHNS HOPKINS UNIVESITY

ADDRESSEE: DR. WILLIAM H. VAN DER SCHALIC
ADDRESSEE'S ORG: US ARMY MEDICAL BIOENGINEERING RESEARCH & DEVELOPMENT LABORATORY

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ID #: 558

SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: POLLUTANT LIMIT VALVE ESTIMATES FOR FIVE POLLUTANTS AT THE BANGOR NAVAL SUBMARINE BASE

DATE: 4/28/81 # OF PAGES: 18 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-5 TYPE: DRAFT REPORT
AUTHOR: D.H. ROSENBLATT, PhD
AUTHOR'S ORG: US ARMY BIOENGINEERING RESEARCH & DEVELOPMENT LABORATORY

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 561

SUB-HEAD: 11.4 TECHNICAL SOURCES
TITLE: A STUDY TO DETERMINE RESIDUES FROM OPEN BURNING OF ORDNANCE-RELATED MATERIALS

DATE: 9/11/84 # OF PAGES: 131 OPERABLE UNIT: 1
DOCUMENT NUMBER: 11.4-OU1-6 TYPE: FINAL REPORT
AUTHOR: MAE FAUTH, PhD, & H.A. DODOHARA
AUTHOR'S ORG: ORDNANCE ENVIRONMENTAL SUPPORT OFFICE (OESO)

ADDRESSEE: NONE
ADDRESSEE'S ORG: NEESA/NACIP DEPT.

****

ID #: 334

SUB-HEAD: 02.8 REMEDIATION STUDIES
TITLE: LEACHATE TREATMENT STUDY, SITES A & C, NAVSUBASE BANGOR

DATE: 9/80 # OF PAGES: 30 OPERABLE UNIT: 1
DOCUMENT NUMBER: 2.8-OU1-1 TYPE: FINAL REPORT
AUTHOR: STEPHEN WAGNER, et. al.
AUTHOR'S ORG: KRAMER, CHIN, & MAYO, INC.

ADDRESSEE: DAVE FRANDSON
ADDRESSEE'S ORG: NAVAL FACILITIES ENGINEERING COMMAND

****

ID #: 331

SUB-HEAD: 02.8 REMEDIATION STUDIES
TITLE: STUDY OF AMELIORATIVE MEASURES FOR ORDNANCE CONTAMINATED SOILS AT SUBASE BANGOR

DATE: 81 # OF PAGES: 38 OPERABLE UNIT: 1
DOCUMENT NUMBER: 2.8-OU1-2 TYPE: FINAL REPORT
AUTHOR: L.J. LAY & T.J. SULLIVAN
AUTHOR'S ORG: ORDNANCE ENVIRONMENTAL SUPPORT OFFICE (OESO)

ADDRESSEE: NONE
ADDRESSEE'S ORG: SUBASE BANGOR

****

ID #: 55

SUB-HEAD: 02.8 REMEDIATION STUDIES
TITLE: PRELIMINARY HEALTH ASSESSMENT FOR SITE A

DATE: 4/10/89 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 2.8-OU1-3 TYPE: REPORT
AUTHOR: AGENCY FOR TOXIC SUBTANCES AND DISEASE REGISTRY
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY

****

ID #: 342

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON OUTLINE FOR BANGOR COMREL PLAN

DATE: 1/13/87 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-1 TYPE: MEMO
AUTHOR: TOM BRINKFIELD
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 352
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD CURRENT SITUATION REPORT - SITE A

DATE: 11/3/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-10 TYPE: LETTER
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: LUIS FUSTE
ADDRESSEE'S ORG: USGS

****

ID #: 354
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: RETURNING CURRENT SITUATION REPORT - SITE A

DATE: 11/9/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-11 TYPE: LETTER
AUTHOR: LUIS A. FUSTE
AUTHOR'S ORG: USGS

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 353
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: REVIEW MEETING ATTENDANCE LIST

DATE: 11/8/88 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-12 TYPE: ATTENDANCE LIST
AUTHOR: NONE
AUTHOR'S ORG: NONE

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 355
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: DEPARTMENT OF ECOLOGY COMMENTS ON DRAFT SITE A COMREL PLAN

DATE: 11/18/88 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-13 TYPE: LETTER
AUTHOR: SANDRA WHITING
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: JESSICA ST. JAMES
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

****

ID #: 356

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A DRAFT COMMUNITY RELATIONS PLAN

DATE: 11/18/88 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-14 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: JESSICA ST. JAMES
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

****

ID #: 357

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A WORK PLANS

DATE: 1/20/89 # OF PAGES: 22 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-15 TYPE: MEMORANDUM
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 358

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: COMMENTS ON SITE A DRAFT WORK PLAN

DATE: 1/27/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-16 TYPE: LETTER
AUTHOR: SANDRA WHITING
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 359

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: RECEIPT OF COMMENTS ON SITE A DRAFT WORK PLAN

DATE: 2/9/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-17 TYPE: LETTER
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB POSS/SANDRA WHITING
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 360

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD SITE A MANAGEMENT PLANS

DATE: 2/22/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-18 TYPE: LETTER
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB POSS/SANDRA WHITING
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 361

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A MANAGEMENT PLAN

DATE: 3/15/89 # OF PAGES: 15 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-19 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 343

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: PROGRESS OF SITE A REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATE: 11/9/87 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-2 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: RANDALL F. SMITH
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 362

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: DEPT. OF ECOLOGY COMMENTS ON SITE A MANAGEMENT PLAN

DATE: 3/21/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-20 TYPE: LETTER
AUTHOR: SANDRA WHITING
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 363
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION REPORT

DATE: 4/17/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-21 TYPE: LETTER
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB POSS/SANDRA WHITING
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 364
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD SITE A PRELIMINARY SCREENING MEMO

DATE: 5/17/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-22 TYPE: LETTER
AUTHOR: JIM RYBOCK
AUTHOR'S ORG: HART CROWSER

ADDRESSEE: BOB POSS/SANDRA WHITING
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 365
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: SITE A COURSE CORRECTION MEETING AGENDA

DATE: 6/16/89 # OF PAGES: 10 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-23 TYPE: AGENDA
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

****

ID #: 366
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: STATE COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION

DATE: 6/21/89 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-24 TYPE: LETTER
AUTHOR: SANDRA WHITING
AUTHOR'S ORG: WASHINGTON STATE DEPT. OF ECOLOGY

ADDRESSEE: ROB ROHOLT
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 367
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: EPA COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION

DATE: 7/11/89 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-25 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY, REGION 10

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 368
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: RESPONSES TO COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION

DATE: 9/5/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-26 TYPE: LETTER
AUTHOR: V. L. VASAITIS
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB GOODMAN
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 369
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: RESPONSES TO COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION

DATE: 9/5/89 # OF PAGES: 15 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-27 TYPE: LETTER
AUTHOR: V. L. VASAITIS
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 372
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY (EPA) STATEMENTS ON NAVY'S RESPONSE TO EPA COMMENTS ON DRAFT REMEDIAL INVESTIGATIN REPORT
DATE: 10/13/89 # OF PAGES: 5 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-28 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: V. L. VASAITIS
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 375
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD RISK ASSESSMENT SPREADSHEETS FOR SITE A

DATE: 1/17/90 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-29 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 344
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: PROGRESS OF SITE A REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATE: 11/13/87 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-3 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: DR. WILLA FISHER
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 376
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A DRAFT FEASIBILITY STUDY, BASELINE RISK ASSESSMENT, & REMEDIAL ACTION OBJECTIVES
DATE: 1/30/90 # OF PAGES: 28 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-30 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: V. L. VASAITIS
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 379
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD ADDITIONAL INFORMATION ON SITE F PROJECT PLANS

DATE: 1/31/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-31 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 378
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: DEPT. OF ECOLOGY COMMENTS ON DRAFT FEASIBILITY STUDY (SITE A)

DATE: 1/31/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-32 TYPE: LETTER
AUTHOR: BOB GOODMAN
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 381
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: LABORATORY DATA VALIDATION FOR SITE A

DATE: 3/1/90 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-33 TYPE: LETTER (FAX)
AUTHOR: TOM HOLM-HANSEN
AUTHOR'S ORG: PRC ENVIRONMENTAL MANAGEMENT, INC.

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 383
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (SITE A) & ANNOUNCE TECHNICAL REVIEW COMMITTEE MEETING FOR APRIL 17, 1990
DATE: 3/22/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-34 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 384
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: RESPONSE TO COMMENTS ON DRAFT FEASIBILITY STUDY (SITE A)

DATE: 3/28/90 # OF PAGES: 73 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-35 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

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ID #: 386

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE-WIDE COMMUNITY RELATIONS PLAN

DATE: 4/13/90 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-36 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 388

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ECOLOGY COMMENTS ON DRAFT BASE-WIDE COMMUNITY RELATIONS PLAN

DATE: 4/23/90 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-37 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: PAT VASICEK
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 389

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATE: 4/23/90 # OF PAGES: 25 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-38 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 390

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: QUALITY ASSURANCE PROJECT PLAN FOR NAVAL SUBMARINE BASE, BANGOR SITE COMPARISON SAMPLE PREPARATION AND USE

DATE: 4/25/90 # OF PAGES: 16 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-39 TYPE: FINAL PLAN (FAX)
AUTHOR: ROY JONES
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 345
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: PROGRESS OF SITE A REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATE: 11/13/87 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-4 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: JOHN LITTLER
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 395
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD DRAFT FINAL BASE-WIDE COMREL PLAN

DATE: 6/19/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-40 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

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ID #: 393
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: DEPT. OF ECOLOGY COMMENTS ON SITE A DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATE: 5/10/90 # OF PAGES: 19 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-41 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 338
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: COMMENTS ON REVISIONS TO O.U. #1 SCHEDULE

DATE: 11/09/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-42 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENIVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: KEVIN STIGILE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY NORTHWEST

****

ID #: 341
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: COMMENTS ON NOVEMBER 15, 1990 REVISIONS TO O.U. #1 SCHEDULE

DATE: 11/19/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-43 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENIVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: KEVIN STIGILE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY NORTHWEST

****

ID #: 350
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: DEPT OF ECOLOGY COMMENTS ON REMEDIAL INVESTIGATION WORK PLANS

DATE: 2/17/88 # OF PAGES: 5 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-44 TYPE: MEMORANDUM
AUTHOR: BOB GOODMAN
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: MARVIN FRYE
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

****

ID #: 694
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: SENDING PROPOSED REMEDIAL ACTION PLAN

DATE: 7/12/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-45 TYPE: LETTER
AUTHOR: KEVIN STIGILE
AUTHOR'S ORG: EFA, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 695
SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: SENDING FINAL PROPOSED REMEDIAL ACTION PLAN

DATE: 7/12/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-46 TYPE: LETTER
AUTHOR: KEVIN STIGILE
AUTHOR'S ORG: EFA, NW

ADDRESSEE: MR. HOWARD BLOOD
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 696

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: SENDING FINAL PROPOSED REMEDIAL ACTION PLAN

DATE: 7/12/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-46 TYPE: LETTER
AUTHOR: KEVIN STIGILE
AUTHOR'S ORG: EFA, NW

ADDRESSEE: CRAIG THOMPSON
ADDRESSEE'S ORG: WASHINGFON STATE DEPT OF ECOLOGY

****

ID #: 697

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: SENDING FINAL PROPOSED REMEDIAL ACTION PLAC

DATE: 7/12/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-48 TYPE: LETTER
AUTHOR: KEVIN STIGILE
AUTHOR'S ORG: EFA, NW

ADDRESSEE: COMMANDING OFFICER
ADDRESSEE'S ORG: NAVAL SUBASE BANGOR (831)

****

ID #: 346

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD SITE A CURRENT SITUATION REPORT AND PROPOSED WORK PLANS

DATE: 12/18/87 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-5 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: DR. WILLA FISHER
ADDRESSEE'S ORG: BREMERTON/KITSAP COUNTY HEALTH DEPT.

****

ID #: 347

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD SITE A CURRENT SITUATION REPORT AND PROPOSED WORK PLANS

DATE: 12/18/87 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-6 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: JOHN LITTLER
ADDRESSEE'S ORG: DEPT. OF ECOLOGY

****

ID #: 348

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: FORWARD SITE A CURRENT SITUATION REPORT AND PROPOSED WORK PLANS

DATE: 12/18/87 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-7 TYPE: LETTER
AUTHOR: CAPT D. D. MIDDLETON
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: RANDALL F. SMITH
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY

****

ID #: 349

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: COMMENTS ON SITE A CURRENT SITUATION REPORT AND WORK PLANS

DATE: 2/8/88 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-8 TYPE: LETTER
AUTHOR: BOB POSS/LEW CONSIGLIERI
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY/NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
ADDRESSEE: MARVIN FRYE
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

****

ID #: 351

SUB-HEAD: 03.1 CORRESPONDENCE
TITLE: EPA COMMENTS ON SITE A REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN

DATE: 5/17/88 # OF PAGES: 10 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.1-OU1-9 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: CAPT D. D. MIDDLETON
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

****

ID #: 633

SUB-HEAD: 03.10 COMMENTS
TITLE: REVIEW OF RI/FS SITE A

DATE: 5/11/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-1 TYPE: LETTER
AUTHOR: PATRICIA A. GANDY
AUTHOR'S ORG: DEPT OF NAVY NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY PORT HUENEME, CA
ADDRESSEE: COMMANDING OFFICER
ADDRESSEE'S ORG: EFA, NW

****

ID #: 619
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON DRAFT RECORD OF DECISION FOR SITE A

DATE: 9/16/91 # OF PAGES: 8 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-10 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPT OF ECOLOGY STATE OF WASHINGTON

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

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ID #: 698
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS TO THE PROPOSED PLAN FOR REMEDIAL ACTION

DATE: # OF PAGES: 8 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-11 TYPE: LETTER
AUTHOR: MARVIN J. FRYE
AUTHOR'S ORG: NAVAL SUBMARINE BASE BANGOR

ADDRESSEE: COMMANDINF OFFICER
ADDRESSEE'S ORG: EFA, NW

****

ID #: 591
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON OU 1 DRAFT FINAL RI/FS

DATE: 1/2/91 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-2 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: GLENNA EIERMANN
ADDRESSEE'S ORG: ENVIRONEMNTAL PROTECTIN AGENCY

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ID #: 622
SUB-HEAD: 03.10 COMMENTS
TITLE: ECOLOGY COMMENTS ON SUBASE BANGOR OU 1 RI/FS REVISION 1

DATE: 1/17/91 # OF PAGES: 7 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-3 TYPE: LETTER
AUTHOR: DAVE ZINK
AUTHOR'S ORG: DEPT OF ECOLOGY STATE OF WASHINGTON

ADDRESSEE: GLENNA EIRMANN
ADDRESSEE'S ORG: EFA, WE

****

ID #: 700
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON SUBASE BANGOR FI/FS WORK PLAN

DATE: 6/16/91 # OF PAGES: 12 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-4 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 699
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON SUBASE BANGOR PROPOSED PLAN

DATE: 6/16/91 # OF PAGES: 6 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-5 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 590
SUB-HEAD: 03.10 COMMENTS
TITLE: CONCERS REGARDING PRELIMINARY DRAFT OF PROPOSED PLAN FOR REMEDIATION OF OU 1

DATE: 6/25/91 # OF PAGES: 5 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-6 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPARTMENT OF ECOLOGY FOR STATE OF WASHINGTON

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 589
SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON REVISED PROPOSED PLAN FOR OU 1

DATE: 7/22/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-7 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPT OF ECOLOGY FOR STATE OF WASHINGTON

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFa, nw

****

ID #: 588

SUB-HEAD: 03.10 COMMENTS
TITLE: COMMENTS ON SITE A PROPOSED PLAN

DATE: 7/30/91 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-8 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 724

SUB-HEAD: 03.10 COMMENTS
TITLE: DRAFT COMMENTS FOR PROPOSED PLAN FOR SITE A

DATE: 8/13/91 # OF PAGES: 5 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.10-OU1-9 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: STATE OF WASHINGTON DEPT OF ECOLOGY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 399

SUB-HEAD: 03.2 SCOPES OF WORK
TITLE: MANAGEMENT PLAN: REMEDIAL INVESTIGATION/FEASIBILITY STUDY, SITE A, SUBASE BANGOR

DATE: 2/16/89 # OF PAGES: 78 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.2-OU1-1 TYPE: FINAL REPORT
AUTHOR: NOT APPLICABLE
AUTHOR'S ORG: HART-CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 400

SUB-HEAD: 03.2 SCOPES OF WORK
TITLE: DRAFT SCOPES OF WORK FOR RI/FS WORK AT OPERABLE UNITS 1 & 2

DATE: 2/7/90 # OF PAGES: 97 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.2-OU1-2 TYPE: LETTER (INCLUDES SOWs)
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NORTHWEST

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

****

ID #: 401

SUB-HEAD: 03.2 SCOPES OF WORK
TITLE: ECOLOGY COMMENTS ON DRAFT SCOPES OF WORK FOR O.U.s 1 & 2

DATE: 3/12/90 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.2-OU1-3 TYPE: LETTER
AUTHOR: BOB POSS
AUTHOR'S ORG: DEPT. OF ECOLOGY

ADDRESSEE: JONATHAN ROGALSKY
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 408

SUB-HEAD: 03.4 ATA/CHAIN OF CUSTODY
TITLE: TRANSMITTAL OF RESULTS OF EPA SPLIT SAMPLING AT SUBASE BANGOR O.U. #1

DATE: 11/15/90 # OF PAGES: 5 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.4-OU1-1 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENIVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BRYAN HAELSIG
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY NORTHWEST

****

ID #: 410

SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: TECHNICAL MEMORANDUM: VINLAND SAMPLING ACTIVITIES IN SUPPORT OF THE SITE A RI/FS, REPORT OF FINDINGS

DATE: 11/1/89 # OF PAGES: 42 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-1 TYPE: DRAFT REPORT
AUTHOR: NONE
AUTHOR'S ORG: HART CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 411

SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: BASELINE RISK ASSESSMENT, SITE A

DATE: 11/10/89 # OF PAGES: 95 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-2 TYPE: DRAFT REPORT
AUTHOR: NONE
AUTHOR'S ORG: HART CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 412
SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: REMEDIAL ACTION OBJECTIVES, SITE A

DATE: 11/21/89 # OF PAGES: 32 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-3 TYPE: REPORT
AUTHOR: NONE
AUTHOR'S ORG: HART CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 413
SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: FEASIBILITY STUDY, SITE A

DATE: 12/18/89 # OF PAGES: 129 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-4 TYPE: REPORT
AUTHOR: NONE
AUTHOR'S ORG: HART CROWSER, INC.

ADDRESSEE: NONE
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

****

ID #: 409
SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: COMMENTS ON SUBASE BANGOR O.U. #1 DRAFT FINAL RI/FS

DATE: 1/02/91 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-5 TYPE: COMMENTS
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: GLENNA EIERMANN, RPM MANAGER
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY NORTHWEST

****

ID #: 630
SUB-HEAD: 03.6 RI/FS REPORTS
TITLE: LETTER SENDING FINAL RI/FS FOR OU 1

DATE: 5/3/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.6-OU1-6 TYPE: LETTER
AUTHOR: PATRICK VASICEK
AUTHOR'S ORG: EFA, NW

ADDRESSEE: WAYNE PIERRE
ADDRESSEE'S ORG: SUBASE BANGOR PROJECT MANAGER

****

ID #: 623
SUB-HEAD: 03.7 PROPOSED PLAN
TITLE: PROPOSED PLAN FOR REMEDIAL FOR NAVAL SUBMARINE BASE, BANGOR SITE A SUPERFUND SITE BANGOR WASHINGTON

DATE: 8/91 # OF PAGES: 11 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.7-OU1-1 TYPE: REPORT
AUTHOR:
AUTHOR'S ORG:

ADDRESSEE:
ADDRESSEE'S ORG:

****

ID #: 626
SUB-HEAD: 03.7 PROPOSED PLAN
TITLE: LETTER SAYING SUBASE HAD REVIEWED PROPOSED PLAN FOR REMEDIAL ACTION AT SITE A

DATE: 8/2/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.7-OU1-2 TYPE: LETTER
AUTHOR: MARVIN J. FRYE
AUTHOR'S ORG: NAVAL SUBMARINE BASE, BANGOR

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 63
SUB-HEAD: 03.8 TREATABILITY STUDIES
TITLE: MULTIPLE SOIL EXTRACTS ON SAMPLES SSA 53 AND SSA 54

DATE: 2/14/88 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.8-OU1-1 TYPE: LETTER
AUTHOR: COMMANDING OFFICER, CM M THORNE BY DIRECTION
AUTHOR'S ORG: NUWES

ADDRESSEE: COMMANDING OFFICER
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE BANGOR

****

ID #: 419
SUB-HEAD: 03.8 TREATABILITY STUDIES
TITLE: RIGHT OF ENTRY

DATE: 8/28/89 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 3.9-OU1-1 TYPE: FINAL AGREEMENT
AUTHOR: JAMES F. BRYANT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: COMMISSIONERS
ADDRESSEE'S ORG: PUBLIC UTILITY DISTRICT NO. 1 OF KITSAP COUNTY

****

ID #: 625

SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: COMMENTS ON PROPOSED PLAN FOR SITE A

DATE: 8/13/91 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-1 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPT OF ECOLOGY STATE OF WASHINGTON

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 586

SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: COMMENTS ON DRAFT ROD FOR OU 1

DATE: 10/10/91 # OF PAGES: 14 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-2 TYPE: LETTER
AUTHOR: HOWARD R. BLOOD
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 587

SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: ECOLOGIES COMMENTS ON THE DRAFT RECORD OF DECISION FOR OU1

DATE: 10/24/91 # OF PAGES: 8 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-3 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPT OF ECOLOGY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 769

SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: EFA'S COMMENTS TO HART CROWSER ON THE PRELIMINARY DRAFT FINAL ROD FOR SITE A

DATE: 11/13/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-4 TYPE: FAX SHEET
AUTHOR: B VARGA
AUTHOR'S ORG: EFA, NW

ADDRESSEE: CLAY PATMONT
ADDRESSEE'S ORG: HART CROWSER

****

ID #: 770
SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: SITE A RECORD OF DECISION "PRELIMINARY" DRAFT FINAL

DATE: 11/13/91 # OF PAGES: 113 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-5 TYPE: REPORT
AUTHOR: HART CROWSER
AUTHOR'S ORG:

ADDRESSEE: EFA NW
ADDRESSEE'S ORG:

****

ID #: 771
SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: COMMENTS ON PRE-FINAL DRAFT ROD

DATE: 11/25/91 # OF PAGES: 9 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-6 TYPE: LETTER
AUTHOR: HOWARD R. BLOOD
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

****

ID #: 772
SUB-HEAD: 04.1 CORRESPONDENCE
TITLE: DRAFT FINAL FOR SITE A RECORD OF DECISION

DATE: 11/27/91 # OF PAGES: 113 OPERABLE UNIT: 1
DOCUMENT NUMBER: 4.1-OU1-7 TYPE: REPORT
AUTHOR: HART CROWSER
AUTHOR'S ORG:

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA NW

****

ID #: 420
SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: MEETING SUMMARY

DATE: 7/29/87 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-1 TYPE: MEMORANDUM
AUTHOR: ROB ROHOLT
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: FILE
ADDRESSEE'S ORG: NONE

****

ID #: 421

SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: ENVIRONMENTAL PROTECTION AGENCY RESPONSE/FOLLOW UP TO JULY 29, 1987 MEETING

DATE: 8/19/87 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-2 TYPE: LETTER
AUTHOR: RANDALL SMITH
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: CAPTAIN D.D. MIDDLETON
ADDRESSEE'S ORG: NAVAL SUBMARINE BASE, BANGOR

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ID #: 422

SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: EPA RECOMMENDATION FOR INCORPORATING THE PROPOSED PLAN SCHEDULE WITH FFA

DATE: 1/5/90 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-3 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: V.L. VASAITIS
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

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ID #: 423

SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: FORWARD SCHEDULES FOR ALL OPERABLE UNITS, EXCEPT #2, BASED ON FFA

DATE: 2/1/90 # OF PAGES: 19 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-4 TYPE: LETTER (WITH SCHEDULES)
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

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ID #: 424

SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: SCHEDULE EXTENSION FOR DRAFT FINAL BASE-WIDE COMREL PLAN

DATE: 5/30/90 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-5 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

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ID #: 425
SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: REQUEST SCHEDULE EXTENSION FOR OPERABLE UNITS 1 AND 2

DATE: 6/22/90 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-6 TYPE: LETTER (WITH PROPOSED SCHED.)
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW

ADDRESSEE: WAYNE PIERRE/BOB POSS
ADDRESSEE'S ORG: ENVIRONMENTAL PROTECTION AGENCY/DEPT. OF ECOLOGY

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ID #: 773
SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: PRELIMINARY DRAFT FINAL ROD FOR SITE A

DATE: 11/18/91 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU1-7 TYPE: LETTER
AUTHOR: CRAIG E. THOMPSON
AUTHOR'S ORG: DEPARTMENT OF ECOLOGY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA, NW

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ID #: 584
SUB-HEAD: 05.1 CORRESPONDENCE
TITLE: NOTIFICATION THAT MR. HOWARD BLOOD HAS BEEN DESIGNATED AS EPA PROJECT MANAGER FOR OU 1 AND 2

DATE: 7/23/91 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.1-OU2-1 TYPE: LETTER
AUTHOR: WAYNE PIERRE
AUTHOR'S ORG: ENVIRONMENTAL PROTECTION AGENCY

ADDRESSEE: BELA VARGA
ADDRESSEE'S ORG: EFA NW

****

ID #: 426
SUB-HEAD: 05.2 FFAs/IAGs
TITLE: FEDERAL FACILITY AGREEMENT FOR NAVAL SUBMARINE BASE, BANGOR

DATE: 1/23/91 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.2-OU1-1 TYPE: MEMORANDUM
AUTHOR: JUDY CONLOW, ASSISTANT COUNSEL
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NORTHWEST

ADDRESSEE: DISTRIBUTION
ADDRESSEE'S ORG:

****

ID #: 427
SUB-HEAD: 05.2 FFAs/IAGs
TITLE: FEDERAL FACILITY AGREEMENT UNDER CERCLA SECTION 120; NAVAL SUBMARINE BASE, BANGOR; ADMINISTATIVE DOCKET NUMBER: 1088-06-15-120
DATE: 1/29/90 # OF PAGES: 69 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.2-OU1-2 TYPE: FINAL AGREEMENT
AUTHOR: NONE
AUTHOR'S ORG: US NAVY/EPA/ECOLOGY
ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

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ID #: 631
SUB-HEAD: 05.2 FFAs/IAGs
TITLE: DISCUSSING FEDERAL FACILITY AGREEMENT
DATE: 10/10/91 # OF PAGES: 2 OPERABLE UNIT: 1
DOCUMENT NUMBER: 5.2-OU1-3 TYPE: LETTER
AUTHOR: KEVIN STIGILE
AUTHOR'S ORG: EFA, NW
ADDRESSEE: HOWARD BLOOD
ADDRESSEE'S ORG: SUBASE BANGOR PROJECT MANAGER

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ID #: 428
SUB-HEAD: 07.1 CORRESPONDENCE
TITLE: FORWARD DRAFT REMEDIAL INVESTIGATION REPORT (SITE A
DATE: 4/26/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 7.1-OU1-1 TYPE: LETTER
AUTHOR: PAT VASICEK
AUTHOR'S ORG: ENGINEERING FIELD ACTIVITY, NW
ADDRESSEE: BARRY JOHNSON
ADDRESSEE'S ORG: ATSDR

****

ID #: 429
SUB-HEAD: 07.1 CORRESPONDENCE
TITLE: RECEIPT OF DRAFT REMEDIAL INVESTIGATION (SITE A)
DATE: 5/19/89 # OF PAGES: 1 OPERABLE UNIT: 1
DOCUMENT NUMBER: 7.1-OU1-2 TYPE: LETTER
AUTHOR: MARK M. BASHOR, PhD
AUTHOR'S ORG: ATSDR
ADDRESSEE: PAT VASICEK
ADDRESSEE'S ORG: ENGINEERING FIELD ACTIVITY, NW

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ID #: 617

SUB-HEAD: 07.1 CORRESPONDENCE
TITLE: CLEANUP LEVELS FOR RDX AND TNT

DATE: 1/9/91 # OF PAGES: 3 OPERABLE UNIT: 1
DOCUMENT NUMBER: 7.1-OU1-3 TYPE: FAX'D LETTER
AUTHOR: LON KISSINGER
AUTHOR'S ORG: DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

ADDRESSEE: DAVE ZINK
ADDRESSEE'S ORG: DEPT OF ECOLOGY STATE OF WASHINGTON

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ID #: 430

SUB-HEAD: 07.2 ATSDR HEALTH ASSESSSMENTS
TITLE: PRELIMINARY HEALTH ASSESSMENT FOR NAVSUBASE SITE A, BANGOR, WA

DATE: 4/10/89 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 7.2-OU1-1 TYPE: FINAL REPORT
AUTHOR: NONE
AUTHOR'S ORG: OFFICE OF HEALTH ASSESSMENT, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY (ATSDR)
ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

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ID #: 431

SUB-HEAD: 09.3 PRESENTATIONS
TITLE: SUMMARY OF PRESENTATION AND MEETING WITH REPRESENTATIVE RAY

DATE: 3/31/89 # OF PAGES: 4 OPERABLE UNIT: 1
DOCUMENT NUMBER: 9.3-OU1-1 TYPE: SUMMARY
AUTHOR: UNKNOWN
AUTHOR'S ORG: UNKNOWN

ADDRESSEE: NONE
ADDRESSEE'S ORG: NONE

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