

8.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

Each alternative for the SWMU 62, New Housing Fuel Leak site was evaluated using the five criteria established by the Alaska DEC in *Guidance on Decision Documentation under the Site Cleanup Rules* (Alaska DEC 1999b): protectiveness; practicability; short- and long-term effectiveness; regulations; and public input. These criteria are summarized in Table 8-1. Public input was not evaluated in the FFS (URS 2005a), because comments had not yet been solicited from the public. Therefore, public input was evaluated after public comments on the proposed plan were received, and the evaluation is included in this document. Each remedial alternative was assessed and assigned a rating of poor, fair, good, excellent, or superior for each evaluation criteria as presented in Figure 8-1. Based on the evaluation of the individual criteria, each alternative was also given an overall rating (poor, fair, good, excellent, or superior).

Alternatives 2 and 3 were both given overall ratings of good. Alternative 2 provides superior implementability and excellent short-term effectiveness and is protective of human health and the environment. However, this alternative requires more time to achieve groundwater cleanup goals than Alternatives 3 and 4. Although Alternative 3 provides excellent long-term effectiveness and protectiveness, it received ratings of good for cost effectiveness, short-term effectiveness, time to achieve cleanup goals, and compliance with regulations. This alternative is capable of achieving the groundwater cleanup goals more quickly than Alternative 2; however, there are additional short-term risks and costs associated with this alternative when compared to Alternative 2.

Alternative 4 was given an overall rating of fair. This alternative was rated lower than Alternatives 2 and 3 because of the difficulty of implementing this complex alternative, the high cost, and the additional short-term risks associated with this alternative. This alternative received superior ratings for time to achieve cleanup goals and long-term effectiveness, and excellent ratings for protectiveness and regulations. Although this alternative provides superior long-term effectiveness, it achieves that through additional remedial actions, which have additional short-term risks and costs.

Alternative 1 was given a rating of poor. This alternative received poor ratings for protectiveness, time to achieve cleanup goals, regulations, and long-term effectiveness. Although this alternative would be easy to implement and would cost nothing, the alternative would not be protective of human health and the environment.

Alternatives 2 and 3 both received the highest overall rating. Therefore, only these two alternatives were considered for selection at the SWMU 62, New Housing Fuel Leak site. A summary of the issues at the SWMU 62, New Housing Fuel Leak site and how Alternatives 2

and 3 address these issues is provided in Table 8-2. A summary of the advantages and disadvantages of these two alternatives is provided in Table 8-3.

Based on these comparisons, Alternative 2, Institutional Controls, Free-Product Containment and Passive Recovery, Surface Soil Excavation, and MNA for Groundwater, was the selected remedial alternative for the SWMU 62, New Housing Fuel Leak site. This alternative will provide an appropriate, cost-effective remedy that protects human health and the environment and that can be implemented at the earliest possible time, as discussed in more detail below. In addition, the state concurs with the selection of this alternative and it is acceptable to the public.

Alternative 2 is selected for SWMU 62, New Housing Fuel Leak site because the additional cleanup activities and costs associated with Alternative 3 are not warranted given that Alternative 2 is protective of human health and the environment. Both Alternatives 2 and 3 effectively protect child residents through excavation and disposal of surface soil. Risks due to construction worker exposure to free product may be slightly higher for Alternative 2 than 3 because the passive free-product recovery activities proposed for Alternative 2 will require more time to reduce measurable quantities of free product in the subsurface when compared to the active free-product recovery activities proposed for Alternative 3. However, appropriate measures can be easily implemented to minimize contact and exposure as long as free product is present in the subsurface. Groundwater cleanup levels will be achieved more quickly with Alternative 3 than with Alternative 2 because of the more aggressive free-product recovery activities proposed for Alternative 3. However, human health will be protected in the interim, for either alternative, because institutional controls prevent the use of the groundwater as a drinking water source. Finally, elimination of the sheen on East Canal is anticipated to take longer with Alternative 2 when compared to Alternative 3. This is due to the implementation of canal bank soil excavation included with Alternative 3, which will quickly eliminate the source of the sheen when compared to implementation of the free-product recovery/containment trench alone, as proposed for Alternative 2. However, sorbent booms will be used in the interim to minimize impacts. Achieving the groundwater cleanup levels and Alaska DEC surface water quality standards for sheen more quickly would result in implementation of a much more complicated system which would be considerably more difficult to implement due to the remoteness of Adak Island. Because Alternative 2 would be much easier to implement than Alternative 3 and Alternative 2 would be protective of human health and the environment, Alternative 2 is the preferred cleanup alternative for the SWMU 62, New Housing Fuel Leak site.

	Rating of Alternatives			
	Alternative 1 No Action	Alternative 2 Institutional Controls, Free-Product Containment and Passive Recovery, Surface Soil Excavation, and MNA for Groundwater	Alternative 3 Institutional Controls, Free-Product Containment and Active Recovery, Canal Bank/Surface Soil Excavation, and MNA for Groundwater	Alternative 4 Institutional Controls, Passive Free- Product Recovery, Surface Soil Excavation, In-Situ Steam Stripping, and MNA for Groundwater
Alaska DEC Criteria				
Protectiveness				
Practicable - Implementability				
Practicable - Cost Effectiveness				
Short- and Long-term Effectiveness Short-term Effectiveness				
Short- and Long-term Effectiveness Time to Achieve Cleanup Goals				
Short- and Long-term Effectiveness Long-term Effectiveness				
Regulations				
Public Input				
Overall				

Notes:

MNA - monitored natural attenuation

Poor Fair Good Excellent Superior

**Table 8-1
 Alaska DEC Criteria for Evaluating Remedial Alternatives**

Criteria	Description
Protectiveness	Whether the remedial alternatives protect human health and the environment both during and after the cleanup actions by eliminating, reducing, or controlling exposures to hazardous substances or contaminants and by protecting human health from physical and other hazards directly associated with the cleanup action
Practicable	Whether the remedial alternatives can be designed, constructed, and implemented in a reliable and cost-effective manner. For ease of evaluation, this criterion is subdivided into two separate criteria; implementability and cost.
Short- and Long-term Effectiveness	Ability of the alternatives to protect human health and the environment during the construction/implementation phase (short-term) and after completion of the cleanup (long-term). The speed with which the alternatives achieve the cleanup goals is also evaluated. For ease of evaluation, this criterion is subdivided into three separate criteria; short-term effectiveness, time to achieve cleanup goals, and long-term effectiveness.
Regulations	Ability of alternatives to attain federal and state applicable or relevant and appropriate requirements or to provide justification for invoking a waiver.
Public input	Whether the public agrees with, opposes, or has no comment on the preferred alternative. Public input will be evaluated after receipt of the public comments on this proposed plan.

Note:
 DEC - Department of Environmental Conservation

Table 8-2
What are the Key Issues at SWMU 62, New Housing Fuel Leak Site and
How Do the Alternatives Address These Issues?

Issue	How is the Issue Addressed?	
	Alternative 2	Alternative 3
Free product in groundwater and sheen in East Canal	Institutional controls (excavation notification), passive free-product recovery and containment in Eagle Bay and Sandy Cove Housing, and natural recovery	Institutional controls (excavation notification), active free-product recovery and free-product containment in Eagle Bay Housing, passive free-product recovery in Sandy Cove Housing, canal bank excavation, and natural recovery
Unacceptable risks to child residents	Surface soil excavation and disposal	Surface soil excavation and disposal
Groundwater concentrations exceed groundwater cleanup levels (Table C values)	Institutional controls (downtown groundwater use prohibition), passive free-product recovery in Eagle Bay and Sandy Cove Housing, and MNA	Institutional controls (downtown groundwater use prohibition), active free-product recovery in Eagle Bay Housing, passive free-product recovery in Sandy Cove Housing, and MNA

Note:
 MNA - monitored natural attenuation

**Table 8-3
 Summary of Advantages and Disadvantages of Alternatives 2 and 3,
 SWMU 62, New Housing Fuel Leak Site**

Advantages and Disadvantages	Alternative 2 – Institutional Controls, Free-Product Containment and Passive Recovery, Surface Soil Excavation, and MNA for Groundwater	Alternative 3 – Institutional Controls, Free-Product Containment and Active Recovery, Canal Bank Soil and Surface Soil Excavation, and MNA for Groundwater
Advantages	<ul style="list-style-type: none"> • Effectively controls exposure to groundwater through institutional controls • Effectively controls human health risk through surface soil excavation and disposal • Reduces volume of free product in subsurface through passive free-product recovery and containment • Reduces sheen on surface water through free-product containment • Reduces groundwater concentrations through passive free-product recovery and natural attenuation • Less expensive • Easy to implement 	<ul style="list-style-type: none"> • Effectively controls exposure to groundwater through institutional controls • Effectively controls human health risk through surface soil excavation and disposal • Reduces volume of free product in subsurface through active free-product recovery, passive free-product recovery, and containment • Reduces sheen on surface water through canal bank excavation and free-product containment • Reduces groundwater concentrations through active free-product recovery, passive free-product recovery, and natural attenuation
Disadvantages	<ul style="list-style-type: none"> • Passive free-product containment alone (not including canal bank soil excavation, as is included for Alternative 3) may require time to reduce sheen in surface water to below water quality criteria. • Passive free-product recovery may require time to reduce groundwater concentrations to below the Alaska DEC Table C values 	<ul style="list-style-type: none"> • More expensive • Relatively difficult to implement for the following reasons: <ul style="list-style-type: none"> ▪ Canal bank soil excavation below the groundwater table complicated by dewatering and shoring requirements ▪ Soil excavation on Adak complicated by the high rainfall ▪ Treatment of water from excavation dewatering complicated because of the extensive treatment required to meet marine surface water quality criteria ▪ Modification and restart of active free-product recovery system adds complexity

Notes:
 MNA - monitored natural attenuation

9.0 DESCRIPTION OF SELECTED CLEANUP ACTION

Alternative 2 – Institutional Controls, Free-Product Containment and Passive Recovery, Surface Soil Excavation, and MNA for Groundwater - is selected as the remedial alternative for the SWMU 62, New Housing Fuel Leak site. This cleanup alternative was selected for the SWMU 62, New Housing Fuel Leak site based on its ability to meet the four RAOs:

1. Prevent human exposure to petroleum hydrocarbons in surface soil that would result in adverse health effects
2. Reduce petroleum hydrocarbons in groundwater to concentrations less than or equal to the Alaska DEC groundwater cleanup levels established for groundwater used as a drinking water source
3. Minimize exposure to free-phase product in soil, groundwater, and surface water
4. Prevent migration of free product to surface water that would result in an exceedance of the Alaska DEC surface water quality standard (sheen only)

The selected cleanup alternative is shown on Figure 9-1 and described below.

The selected cleanup alternative, Alternative 2, consists of institutional controls for soil, groundwater, and surface water; free-phase product containment and passive recovery; excavation and treatment of surface soil; and MNA for groundwater. A free-product collection/containment trench will be installed to prevent migration of free-phase product to surface water, thus eliminating the source of the sheen to East Canal. Sorbent booms will be used as an interim measure to reduce surface water sheen on East Canal until the free-product collection/containment trench effectively eliminates the source of the sheen. Although operation of the free-product system at SWMU 62, New Housing Fuel Leak site has been discontinued, between 1,400 and 6,900 gallons of recoverable product are estimated to still remain at the site. Therefore, four new wells will be installed, and free-phase product will be removed from the new wells and existing site wells using automated passive skimmers, passive skimmers, or sorbent socks. Surface soil in Sandy Cove Housing 102, 107, and 146 Area with DRO concentrations exceeding the ACLs will be excavated and treated. Petroleum concentrations in groundwater will be reduced through natural attenuation. Finally, institutional controls will be used to protect human health and the environment until groundwater no longer exceeds Alaska DEC groundwater cleanup levels and surface water no longer exceeds the Alaska DEC Water Quality Standard for sheen.

Soil cleanup goals will be achieved immediately after excavation of surface soils. The MNA timeframe for the site cannot be accurately predicted at this time. However, the timeframe needed to achieve the Alaska DEC groundwater cleanup levels will be estimated after 5 years of monitoring has been completed. Surface water cleanup goals for East Canal consist of a requirement for no sheen. Soils between East Canal and the free-product collection/containment trench will not be excavated, and these soils will act as a continuing source of sheen until the remaining free product is flushed from the soils. Very small amounts of free product can result in a sheen on the surface water body. However, the large rainfall amount on Adak is expected to result in relatively quick flushing of the free product from canal bank soils. Based on this, it is anticipated that within approximately 8 years of construction of the free-product collection/containment trenches, no sheen will be visible on East Canal. Recovery from the free-product collection/containment trench will continue until free-product has been reduced to thicknesses less than 0.01 feet or no sounding of the oil/water interface probe has been experienced for 1 year or more (estimated at 20 years). It is anticipated that free-product recovery will be completed within 5 years of the start of recovery operations in the new and existing wells. Short-term risks associated with free-product collection/containment trench installation, new well installation, surface soil excavation, MNA, and product recovery will be controlled through the use of personal protective equipment. Once surface soil has been excavated, groundwater concentrations have been reduced to levels less than the Alaska DEC groundwater cleanup levels established for groundwater used for drinking water, and free product has been removed to the extent practicable in accordance with the OU A ROD, residual risks at the site are expected to be acceptable. Note that pockets of free product may remain at the site, even if none is detected in on-site wells. Therefore, some residual risk may remain at a site once cleanup actions have been completed. However, if groundwater concentrations are below cleanup levels throughout the site, the extent of free product is expected to be very limited.

The institutional controls implemented at this site consist of equitable servitude restrictions including the downtown groundwater use prohibition and soil excavation notification requirements. These institutional controls have already been implemented on Adak Island. The Navy has an established institutional controls program that was developed to ensure that institutional controls, including the equitable servitude restrictions, selected in the OU A ROD remain effective and reliable. The Navy has prepared an ICMP (U.S. Navy 2004) documenting the approach the Navy will use to ensure that the equitable servitude restrictions remain protective. The ICMP provides details of the institutional controls management program, and therefore, a detailed description of the equitable servitude restrictions to be implemented at the SWMU 62, New Housing Fuel Leak site is not included here. Access restrictions including temporary fences and signs will be used to prevent access to contaminated materials during free-product collection/containment trench installation and surface soil excavation. Site inspections will be used to evaluate compliance with equitable servitude restrictions and access restrictions.

Visual site inspections will also be used to evaluate whether surface water no longer exceeds the Alaska DEC Water Quality Standards for sheen in East Canal. Monitoring of groundwater will continue until groundwater cleanup goals are achieved.

Monitoring of natural attenuation will involve periodic groundwater sampling at the site for a period of time sufficient to assess the progress of the natural degradation of petroleum hydrocarbons in groundwater. Details of the monitoring program will be incorporated into subsequent versions of the comprehensive monitoring plan for the Former Adak Naval Complex (CMP) (URS 2004). The CMP describes the existing monitoring program for groundwater as prescribed in the OU A ROD. Groundwater monitoring will be conducted at a frequency to be established by the Navy and Alaska DEC to evaluate whether petroleum-related chemicals in the groundwater are attenuating to concentrations below applicable Alaska DEC groundwater cleanup levels at locations to be specified in the CMP. Concentrations of petroleum-related chemicals currently exceeding the Alaska DEC cleanup levels will be monitored, as well as natural attenuation indicator parameters. Groundwater sampling will be conducted following procedures specified in the appropriate Navy Standard Operating Procedures (SOPs) as specified in future versions of the CMP. Groundwater samples will only be collected for chemical analyses from individual wells if the measured product thickness in the well is less than 0.02 foot. The Navy proposes to initiate remedy-based MNA at this site in conjunction with annual monitoring activities planned for 2006 as specified in the CMP. All groundwater monitoring activities at SWMU 62, New Housing Fuel Leak site will be coordinated with the ongoing annual monitoring activities described in the CMP.

All available site-specific data will be evaluated after each year of monitoring is completed. These data evaluations will be performed to assess whether specified institutional controls are being successfully implemented at the sites, concentrations of petroleum-related chemicals in groundwater are decreasing, and/or free product is being recovered to the extent practicable. These analyses will incorporate historical, site-specific data where appropriate. Once the annual data evaluation is completed, the Navy will make recommendations for modifications to the monitoring program, as appropriate. If the groundwater contaminant plume is shown to be stable or shrinking during three consecutive annual monitoring events, then the Navy will petition Alaska DEC for less frequent monitoring. MNA and free-product monitoring will be discontinued once the Alaska DEC groundwater cleanup levels for groundwater used as drinking water are achieved during three consecutive monitoring events in all site wells selected for monitoring in the CMP.

As part of the 5-year reviews required by Amendment Number 3 to the Adak FFA (U.S. Navy, USEPA, and ADEC 2002) and Amendment Number 0001 to the SAERA between the Navy and ADEC (U.S. Navy and ADEC 2002), the results of monitoring will be summarized by the Navy and submitted for review by the Alaska DEC. The 5-year reviews will evaluate the effectiveness of the selected remedy at the SWMU 62, New Housing Fuel Leak site. Based on these reviews,

the Navy and the Alaska DEC will decide whether continued monitoring, or additional actions, are necessary at the site.

A free-phase product collection trench will be installed in the general area shown on Figure 9-1. This general location was selected based on the occurrence of a sheen on East Canal and free-product thicknesses in groundwater near to East Canal in the Eagle Bay Housing 303 Area based on measurements from 2000 through 2003. The trench will be constructed such that free product will be collected within the maximum range of groundwater fluctuation. The exact dimensions of the trench will be determined during remedial design. Sumps for free-product recovery will be installed in the trench. Because of the uncertainty of the recoverable free-product volume remaining at the SWMU 62, New Housing Fuel Leak site, initially, automated passive skimmers will be installed in each sump to recover free-phase product. Recovery rates are assumed to decline with time, and the automated passive skimmers will be replaced with sorbent socks. Recovery from the free-product trench will continue until product has been reduced to less than 0.01 inches or no sounding of the oil/water interface probe has been experienced for 1 year or more.

Groundwater encountered during trench excavation will be pumped to a water treatment system. Recovered product from the water treatment system will be placed in 55-gallon drums for off-site disposal or recycling on-island. The treated groundwater will be discharged to East Canal. (Note that the conceptual design presentation in the FFS included discharge to an infiltration trench.) The discharged water will meet all Alaska DEC surface water criteria (18 AAC 70). Since EPA has deferred authority to the Alaska DEC and the total volume that will be discharged to surface water is anticipated to be less than 250,000 gallons, Alaska DEC has determined that permits will not be required. However, the discharge must meet the substantive requirements of the Alaska DEC General Excavation Dewatering Permit 2004DB0101. Soil from the free-product collection/containment trench excavation will be shipped to the mainland for treatment and disposal, unless soil treatment using thermal desorption could be timed to coincide with the thermal desorption of soil from other sites on Adak. Estimated costs for this alternative assumed off-site treatment/disposal because thermal desorption for soils from this site alone will not be cost effective, and concurrent work with another site cannot be guaranteed.

Recoverable product will also be removed from new wells and existing site wells using automated passive skimmers, passive skimmers, or sorbent socks (see Figure 9-1). Automated passive skimmers will be installed in existing wells with a maximum free-product thickness greater than 0.5 feet measured between 2000 and 2003. Passive skimmers will be installed in existing wells with a maximum free-product thickness greater than or equal to 0.1 feet and less than or equal to 0.5 feet. Sorbent socks will be installed in existing wells with a maximum free-product thickness less than 0.1 feet. Therefore, automated passive skimmers will be installed in five wells: HMW-139-2, HMW-303-3, MW-303-12, MW-303-8, RW-303-4. Passive skimmers will be installed in 14 wells: HMW-146-1, 03-101, 03-102, 03-518, CTO124-MW15,

HMW-303-11, HMW-303-5, HMW-303-9, MW-303-1, MW-303-10, MW-303-18, MW-303-7, RW-303-6, and RW-303-7. Finally, sorbent socks will be installed in 18 wells: HMW-102-1, MW-102-4, MW-107-11, RW-102-4, MW-187-3, MW-134-10, MW-134-8, 03-696, 03-107, CTO 124-MW14, HMW-303-1, HMW-303-10, HMW-303-2, HMW-303-4, MW-303-5, RW-303-11, RW-303-12, and RW-303-9. Four new wells, NW 1 through NW 4 (Figure 9-1), will be installed in locations between two wells containing product or in locations to be used to better define the extent of free product. The goal of installing new wells will be to increase the effective area of product recovery and decrease the recovery duration, thereby optimizing recovery. If free product is detected in these new wells, passive skimmers will be installed. The new wells will also be used for groundwater monitoring. Free-product recovery in all wells will occur on a schedule commensurate with skimmer capacity. This schedule may be modified to optimize the recovery rate. The wells utilized to recover product may change due to changes in site conditions. In addition, the technology used to recover free product will change with time as free product is recovered at the site. Automated passive skimmers and passive skimmers will be replaced with sorbent socks as the volume of recoverable product declines at the site.

Free product occurrence will be measured in additional wells as part of the monitoring of natural attenuation to assess if free product is migrating and if additional wells should be added to the recovery system in the future. The installation of additional product recovery or monitoring wells, if needed, is considered a contingent component of the selected remedy. Any future decision by the Navy and ADEC to install and operate additional product recovery or monitoring wells will not be considered a basis for amending or reopening this DD. Removal of free-phase product will continue until the technically practicable endpoint for passive free-phase product recovery, as defined in the OU A ROD (U.S. Navy et al. 2000), is achieved. The technically practicable endpoint for product recovery systems not dependent on water table depression is as follows:

When the monthly volume of recovered product averaged over the most recent 6 months (6-month moving average) is less than 5 gallons of product recovered per month, the technically practicable endpoint for recovery has been reached. If this endpoint criterion has been met for a period of 12 months of product recovery, the system is considered to meet the technically practicable endpoint and recovery can be discontinued (URSG 1999b).

To quickly eliminate the unacceptable health risks to children due to exposure to surface soils in Sandy Cove Housing 102, 107, and 146 Area, surface soils with concentrations of DRO greater than the ACL (6,111 mg/kg) will be excavated. The approximate area of the surface soil excavation is shown on Figure 9-1. Soil will be removed to a depth of 2 feet. The limits of excavation will be better defined prior to or during excavation activities. Soil from the surface soil excavation will be combined with the soil excavated during trench installation and will be shipped to the mainland for treatment and disposal, unless thermal desorption could be timed to

coincide with the thermal desorption of soils from other sites on Adak. Clean fill will be used to backfill the surface soil excavation area.

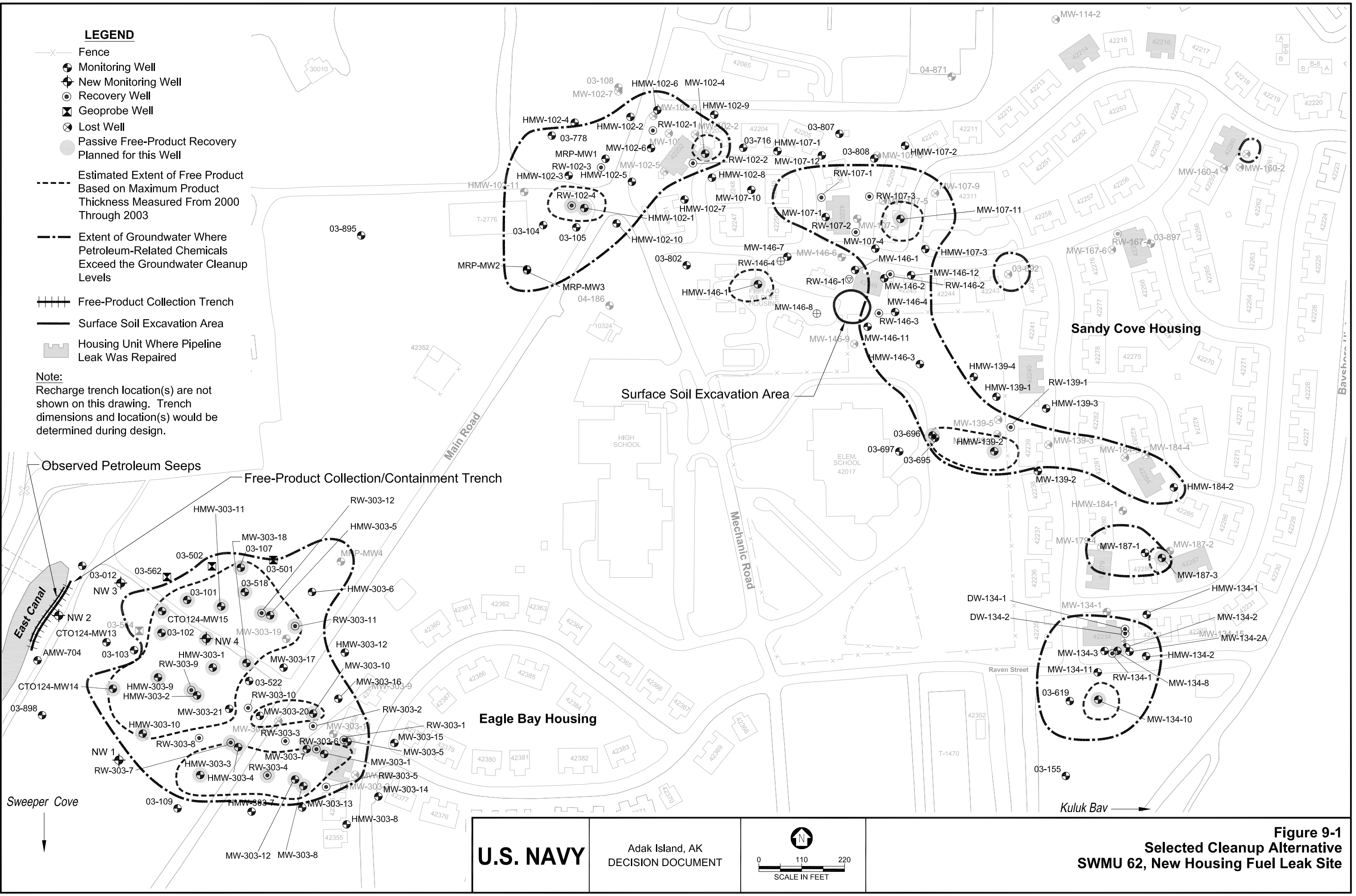
The costs for this alternative are presented in Table 9-2 and are based on the conceptual design presented in the FFS (URS 2005). These cost estimates include capital costs, periodic maintenance, and monitoring. The capital costs for installation of the free-product collection/containment trench with automated passive skimmers, installation of four new wells with passive skimmers, installation of automated passive skimmers, passive skimmers and/or sorbent socks in existing wells, and surface soil excavation, including mobilization and demobilization, are estimated to be \$1.1 million. Annual O&M costs to operate the free-product collection/containment trench are \$150,000 for the first 2 years and \$100,000 for years 3 to 18. Annual O&M costs to recover free product from the 38 wells are \$410,000 for the first 2 years and \$350,000 for years 3 to 5. Annual O&M costs to maintain the sorbent boom are estimated to be \$33,000. Annual costs to implement MNA for groundwater are estimated to be \$70,000. The costs associated with MNA are the incremental costs associated with the SWMU 62, New Housing Fuel Leak site, which are above the base program costs associated with monitoring activities specified in the CMP. The MNA estimate includes the costs associated with sample collection at the SWMU 62, New Housing Fuel Leak site, sample analysis, and the incremental reporting and mobilization costs.

The present worth cost for this alternative based on the conceptual design presented in the FFS assuming a 5 percent discount rate, a 60-year natural attenuation monitoring period, 20 years of free-product recovery from the free-product collection/containment trenches, and 5 years of passive free-phase recovery from the existing wells is \$5.5 million (URS 2005). Total capital and O&M costs (no present worth) for this alternative are estimated to be \$9.1 million. Costs associated with the implementation of institutional controls at this site were not estimated because existing island-wide institutional controls will cover site-specific restrictions. The duration of monitoring and product recovery may vary substantially from the estimated values used in the cost estimate. Actual duration of monitoring and product recovery will be based on endpoints specified earlier in this section.

LEGEND

- x— Fence
- Monitoring Well
- ⊕ New Monitoring Well
- Recovery Well
- ⊠ Geoprobe Well
- ⊗ Lost Well
- Passive Free-Product Recovery Planned for this Well
- - - - - Estimated Extent of Free Product Based on Maximum Product Thickness Measured From 2000 Through 2003
- — — — — Extent of Groundwater Where Petroleum-Related Chemicals Exceed the Groundwater Cleanup Levels
- ||||| Free-Product Collection Trench
- Surface Soil Excavation Area
- ▣ Housing Unit Where Pipeline Leak Was Repaired

Note:
Recharge trench location(s) are not shown on this drawing. Trench dimensions and location(s) would be determined during design.



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U.S. NAVY

Adak Island, AK
DECISION DOCUMENT

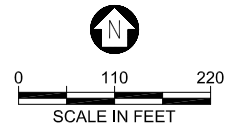


Figure 9-1
Selected Cleanup Alternative
SWMU 62, New Housing Fuel Leak Site

Table 9-1
SWMU 62, New Housing Fuel Leak Site
Cost Estimate For Alternative 2:
Institutional Controls, Free-Product Containment and Passive Recovery,
Surface Soil Excavation, and MNA

Item	Unit Cost	Units	Quantity	Cost
CAPITAL DIRECT COSTS (INSTALLED)				
Free-Product Collection/Containment Trench Installation				
Mobilization of Excavation Equipment				
Mobilize/Demobilize	\$75,000	LS	1	\$75,000
Barge to Adak Island (round trip)	\$150,000	LS	1	\$150,000
Trench Installation				
Excavate/backfill trench with gravel	\$2.75	SF	1,300	\$3,575
12-inch stainless steel sumps	\$350	LF	60	\$21,000
Automated passive skimmers	\$2,500	EA	6	\$15,000
Installation of remote system/battery power	\$4,500	EA	6	\$27,000
Equipment installation	\$8,000	Week	1	\$8,000
Dewatering and Treatment				
Dewatering	\$160	Days	2	\$320
Water distribution infrastructure	\$500	LS	1	\$500
Treatment - Connect to existing OWS	\$2,500	LS	1	\$2,500
Treatment - Bag Filter/Activated Carbon Filtration	\$600	Day	2	\$1,200
Installation of Recharge Trenches	\$10	SF	260	\$2,600
Off-island landfill disposal of trench soil	\$525	CY	190	\$99,750
Sorbent boom installation and disposal	\$4.00	LF	400	\$1,600
Surface Soil Excavation				
Soil Excavation				
2-4 CY Excavator	\$10,000	Week	1	\$10,000
Fill source excavation, placement and haul	\$1,725	Week	1	\$1,725
Misc. Supplies and Labor	\$500	Day	3	\$1,500
Off-island landfill disposal of surface soil	\$525	CY	450	\$236,250
Well Installation Costs				
Mob/Demob crew/equip	\$20,000	LS	1	\$20,000
Per Diem	\$4,700	Week	1	\$4,700
Equipment Rental	\$2,200	Week	1	\$2,200
Well Construction (Labor)	\$15,000	Week	1	\$15,000
Well Construction (Materials)	\$1,000	Well	4	\$4,000
Passive Skimmer and Sorbent Sock Installation				
Automated passive skimmers	\$2,500	Well	5	\$12,500
Passive skimmers	\$450	Well	15	\$6,750
Sorbent socks	\$8.50	Well	18	\$153
Equipment Install	\$8,000	Week	1	\$8,000
Subtotal Capital Costs				\$730,823

Table 9-1 (Continued)
SWMU 62, New Housing Fuel Leak Site
Cost Estimate For Alternative 2:
Institutional Controls, Free-Product Containment and Passive Recovery,
Surface Soil Excavation, and MNA

Item	Unit Cost	Units	Quantity	Cost
Subtotal Capital Costs				\$730,823
Contingency Allowances		%	25	\$182,706
TOTAL CAPITAL DIRECT COSTS (DC)				\$730,000
CAPITAL INDIRECT COSTS				
Preliminary Design	DC	%	5	\$36,500
Engineering Design	DC	%	10	\$73,000
Regulatory Compliance	DC	%	5	\$36,500
Construction QA and Management	DC	%	7	\$51,100
System Startup	DC	%	5	\$36,500
Closure Documentation	DC	%	5	\$36,500
TOTAL CAPITAL INDIRECT COSTS				\$270,000
Total Direct and Indirect Capital Costs				\$1,000,000
Site Inspection and Overhead Costs	Total Costs	%	8	\$80,000
TOTAL CAPITAL COSTS				\$1,100,000
ANNUAL O&M COSTS				
Annual Free-Product Collection/Containement Trench (Years 1-2)				
Mobilization				
Mobilize/Demobilize	\$2,000	Month	12	\$24,000
Shipping	\$7.00	CF	600	\$4,200
Monitoring/Maintenance				
Project Management/Coordination	\$1,440	EA	6	\$8,640
Field Labor	\$2,400	EA	6	\$14,400
Supplies	\$3,000	EA	6	\$18,000
Free Product Recycling/Disposal	\$15,000	YR	1	\$15,000
Battery/remote system repair/replacement	\$25,000	YR	1	\$25,000
SUBTOTAL TRENCH COSTS				\$109,240
Contingency Allowances		%	25	\$27,310
Site Inspection and Overhead Costs		%	8	\$10,924
TOTAL ANNUAL TRENCH COSTS (YRS 1-2)				\$150,000
Cost Projection for 2 years				\$300,000
2-Yr Present Worth Trench Recovery*				\$280,000

Table 9-1 (Continued)
SWMU 62, New Housing Fuel Leak Site
Cost Estimate For Alternative 2:
Institutional Controls, Free-Product Containment and Passive Recovery,
Surface Soil Excavation, and MNA

Item	Unit Cost	Units	Quantity	Cost
Annual Free-Product Collection/Containment Trench (Years 3-18)				
Mobilization				
Mobilize/Demobilize	\$2,000	Month	12	\$24,000
Shipping	\$7.00	CF	400	\$2,800
Monitoring/Maintenance				
Project Management/Coordination	\$1,440	EA	6	\$8,640
Field Labor	\$2,400	EA	6	\$14,400
Supplies	\$2,000	EA	6	\$12,000
Sorbent Disposal	\$15,000	YR	1	\$15,000
SUBTOTAL TRENCH COSTS				\$76,840
Contingency Allowances		%	25	\$19,210
Site Inspection and Overhead Costs		%	8	\$7,684
TOTAL ANNUAL PRODUCT TRENCH RECOVERY				\$100,000
Cost Projection for 18 years				\$1,800,000
18-Yr Present Worth Trench Recovery*				\$1,000,000
Annual Passive Free-Product Recovery in Wells (Years 1-2)				
Mobilization				
Mobilize/Demobilize	\$2,000	Month	12	\$24,000
Shipping	\$7.00	CF	1,000	\$7,000
Monitoring/Maintenance				
Project Management/Coordination	\$1,440	EA	38	\$54,720
Field Labor	\$2,400	EA	38	\$91,200
Supplies	\$3,000	EA	38	\$114,000
Free Product Recycling/Disposal	\$15,000	YR	1	\$15,000
SUBTOTAL RECOVERY COSTS				\$305,920
Contingency Allowances		%	25	\$76,480
Site Inspection and Overhead Costs		%	8	\$30,592
TOTAL PRODUCT RECOVERY COSTS (YRS 1-2)				\$410,000
Cost Projection for 2 years				\$820,000
2-Yr Present Worth Free Product Recovery*				\$760,000

Table 9-1 (Continued)
SWMU 62, New Housing Fuel Leak Site
Cost Estimate For Alternative 2:
Institutional Controls, Free-Product Containment and Passive Recovery,
Surface Soil Excavation, and MNA

Item	Unit Cost	Units	Quantity	Cost
Annual Passive Free-Product Recovery in Wells (Years 3-5)				
Mobilization				
Mobilize/Demobilize	\$2,000	Month	12	\$24,000
Shipping	\$7.00	CF	600	\$4,200
Monitoring/Maintenance				
Project Management/Coordination	\$1,440	EA	38	\$54,720
Field Labor	\$2,400	EA	38	\$91,200
Supplies	\$2,000	EA	38	\$76,000
Sorbent Disposal	\$10,000	YR	1	\$10,000
SUBTOTAL RECOVERY COSTS				\$260,120
Contingency Allowances		%	25	\$65,030
Site Inspection and Overhead Costs		%	8	\$26,012
TOTAL PRODUCT RECOVERY COSTS (YRS 3-5)				\$350,000
Cost Projection for 3 years				\$1,050,000
3-Yr Present Worth Free Product Recovery*				\$820,000
Annual Sorbent Boom Maintenance Costs				
Mobilization				
Mobilize/Demobilize	\$2,000	Month	12	\$24,000
Shipping	\$7	CF	300	\$2,100
Sorbent Boom Replacement and Disposal	\$1,600	EA	4	\$6,400
TOTAL ANNUAL BOOM MAINTENANCE COST				\$33,000
Cost Projection for 8 years				\$260,000
8-Yr Present Worth Boom Maintenance*				\$210,000
Annual MNA Costs				
Mobilization				
Mobilize/Demobilize	\$2,000	LS	1	\$2,000
Shipping	\$7.00	CF	1,000	\$7,000
Monitoring				
Project Management/Coordination	\$120	Well	25	\$3,000
Field Labor	\$480	Well	25	\$12,000
Hydrogeologist	\$100	Well	25	\$2,500
Equipment Rental	\$1,620	Week	2	\$3,240
Sampling Supplies	\$45	Well	25	\$1,125
Analytical (DRO, GRO, BTEX, SVOCs)	\$850	Well	25	\$21,250
SUBTOTAL MNA COSTS				\$52,115
Contingency Allowances		%	25	\$13,029
Site Inspection and Overhead Costs		%	8	\$5,212
TOTAL ANNUAL MNA COST				\$70,000
Cost Projection for 60 years				\$4,200,000
60-Yr Present Worth MNA*				\$1,330,000

Table 9-1 (Continued)
SWMU 62, New Housing Fuel Leak Site
Cost Estimate For Alternative 2:
Institutional Controls, Free-Product Containment and Passive Recovery,
Surface Soil Excavation, and MNA

Item	Unit Cost	Units	Quantity	Cost
TOTAL CAPITAL COSTS				\$1,100,000
TOTAL O&M COSTS (60 YEARS)				\$8,000,000
TOTAL CAPITAL AND O&M COSTS (60 YEARS)				\$9,100,000
PRESENT WORTH O&M COSTS*				\$4,400,000
TOTAL PROJECT PRESENT WORTH*				\$5,500,000

* Present worth costs calculated using a 5% discount rate.

Notes:

- CF = Cubic Feet
- CY = Cubic yard
- EA = Each
- LB = Pound
- LF = Linear Feet
- LS = Lump Sum
- MNA = Monitored natural attenuation
- O&M = Operation and maintenance
- OWS = Oil/Water Separator
- QA = Quality assurance
- SF = Square Feet
- YR = Year

10.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable or relevant and appropriate requirements (ARARs) are promulgated federal and state laws and regulations that are either applicable to the conditions at a cleanup site or are relevant and appropriate. Relevant and appropriate requirements address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the site. Three kinds of ARARs exist for cleanup of petroleum release sites on Adak Island: chemical-specific, location-specific, and action-specific.

10.1 CHEMICAL-SPECIFIC ARARS

Chemical-specific ARARs are generally risk-based concentration limits or discharge limits for specific chemicals. When a specific chemical is subject to more than one discharge or exposure limit, the more stringent requirement is used. Chemical-specific ARARs for the SWMU 62, New Housing Fuel Leak site include Alaska DEC regulations 18 AAC 75 and 18 AAC 70 and the Clean Water Act.

As discussed in Section 6, Alaska DEC regulation 18 AAC 75 specifies soil and groundwater cleanup criteria established for petroleum-release sites located within the State of Alaska. Cleanup levels specified for soil at free-product recovery petroleum sites on the Former Adak Naval Complex are based on Alaska DEC Method Four criteria [18 AAC 75.340(a)(4)]. Cleanup levels specified for groundwater at the South of Runway 18-36 Area are based on the tabulated groundwater cleanup levels [18 AAC 75.345(b)(1), Table C] because groundwater is a potential future source of drinking water. Alaska regulations [18 AAC 75.345(f)] specify that groundwater hydrologically connected to nearby surface water may not cause a violation of the water quality standards in 18 AAC 70 for surface water. In addition, ambient water quality criteria (33 United States Code 1314, Clean Water Act) are relevant and appropriate for surface water that could be impacted by plume migration.

10.2 LOCATION-SPECIFIC ARARS

Location-specific ARARs are those requirements that relate to the geographic position or physical condition of the site. These requirements may limit the type of remedial activities that can be implemented or may impose additional constraints. There are no potential location-specific ARARs for SWMU 62, New Housing Fuel Leak site because remedial actions are not proposed in sensitive environments.

10.3 ACTION-SPECIFIC ARARS

Action-specific ARARs generally set performance, design, or other similar action-specific controls or restrictions on particular kinds of activities. Potentially applicable action-specific ARARs for the selected cleanup alternative include the following:

- Alaska Air Quality Control (18 AAC 50.300 through 50.380)
- Resource Conservation and Recovery Act (RCRA) regulations (40 Code of Federal Regulations [CFR] Parts 261, 262, 268)
- Alaska Hazardous Waste Disposal Regulation (18 AAC 62)
- Alaska Oil and Hazardous Substances Pollution Control (18 AAC 75.325 through 375)
- Alaska Water Quality Standards (18 AAC 70.20)
- Alaska Wastewater Disposal (18 AAC 72.500 through 72.610)
- Federal Clean Water Act – National Pollution Discharge Elimination System (NPDES) Program (40 CFR Part 131)

11.0 PUBLIC INVOLVEMENT

11.1 PUBLIC INVOLVEMENT ACTIVITIES

The Navy established a community involvement program in 1994 to provide interested Alaska citizens and Adak residents with timely and updated information on the environmental cleanup and the transfer and reuse of Navy land and facilities. The community involvement program also provides a mechanism for public input on environmental cleanup decisions. Information is conveyed to the public via fact sheets and newsletters, Restoration Advisory Board (RAB) meetings and other formal public meetings, web site announcements (www.adakupdate.com), information repositories on Adak Island (Bob Reeve High School building, second floor) and in Anchorage (University of Alaska library, reserve room), and the administrative record file located at Naval Facilities Engineering Command Northwest, Silverdale, Washington. In addition, a mailing list is maintained and updated to inform concerned citizens of upcoming meetings and significant activities, such as public comment periods. Public input is obtained through RAB meetings and other formal public meetings, community interviews, requests for public comments, and a telephone hotline.

The proposed plan (U.S. Navy and Alaska DEC 2005a) was provided to the public for review during the 30-day public comment period beginning on December 13, 2005. In addition, TAC (the current landowner) was provided a copy of the FFS report (URS 2005a) and the proposed plan (U.S. Navy and Alaska DEC 2005a) and was invited to comment on these documents. No comments were received.

11.2 FUTURE CONTACTS

Adak community members are encouraged to contact Navy and Alaska DEC site managers with questions or comments. The Navy and Alaska DEC site managers are:

Gary D. Simmons
Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, WA 98370-7570
Phone: (360) 396-0911
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FINAL DECISION DOCUMENT
SWMU 62, New Housing Fuel Leak
Former Adak Naval Complex
U.S. Navy, Naval Facilities Engineering Command Northwest

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12.0 RESPONSIVENESS SUMMARY

No comments received.

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APPENDIX A

Legal Description

APPENDIX A

Legal Description

That portion of Adak Island, State of Alaska, described as follows:

Commencing at U.S. Navy control point H-7 (NAD 83 - N=317,457.30 E=3,135,573.38), which is South 22°36'59" West 1,731.18 feet from U.S. Navy control point H-5; thence South 07°28'46" East 120.62 feet; thence South 27°26'31" West 235.79 feet; thence South 80°39'03" West 566.73 feet; thence North 18°50'29" West 442.33 feet; thence North 19°30'20" East 202.44 feet; thence South 89°29'26" East 390.89 feet; thence South 61°11'42" East 384.07 feet to the POINT OF BEGINNING. Containing 8.58 acres more or less. ALSO

That portion of Adak Island, State of Alaska, described as follows:

Commencing at said U.S. Navy control point H-7 thence North 31°29'08" East 702.85 feet to the POINT OF BEGINNING; thence North 58°28'50" West 198.18 feet; thence North 50°21'26" East 154.51 feet; thence North 10°25'07" East 476.72 feet; thence South 82°20'32" East 989.67 feet; thence South 35°42'47" East 227.90 feet; thence South 06°15'24" East 566.98 feet; thence South 86°20'06" East 327.36 feet; thence South 30°33'14" East 311.41 feet; thence South 03°56'30" East 335.56 feet; thence South 77°57'55" West 663.42 feet; thence North 16°14'39" West 753.41 feet; thence North 38°51'46" West 567.31 feet; thence North 74°50'18" West 342.95 feet; thence South 31°29'08" West 331.99 feet to the POINT OF BEGINNING. Containing 27.09 acres more or less.

APPENDIX B
Analytical Results

Table B-1
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Turnkey Housing Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
472	HMW-67-1	8/21/1993	5 to 5	10	NA	NA	NA	NA	NA
Screening Criteria^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria^b				12,500	1,400	6.4	180	89	81
Screening Criteria^c				230	260	0.02	4.8	5	69

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-2
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Turnkey Housing Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
472	HMW-67-1	AW	8/24/1993	7,220	NA	NA	NA	NA	NA
<i>Primary Groundwater Unit</i>									
470	MW-67-1	LW	7/2/1993	420	NA	NA	NA	NA	NA
471	MW-67-2	AW	7/2/1993	910	NA	NA	NA	NA	NA
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

GW - Geoprobe well

J - estimated concentration

LW - lost well

ug/L - microgram per liter

MW - monitoring well

NA - not analyzed

RW - recovery well

U - not detected at concentration shown

Table B-3
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
125	95	8/1/1993	6 to 8	4,500	NA	NA	NA	NA	NA
126	120	8/1/1993	6 to 8	26	NA	NA	NA	NA	NA
127	121	8/1/1993	6 to 8	52	NA	NA	NA	NA	NA
128	328	8/1/1993	6 to 8	17	NA	NA	NA	NA	NA
129	255	8/1/1993	6 to 8	240	NA	NA	NA	NA	NA
130	325	8/1/1993	6 to 8	66	NA	NA	NA	NA	NA
131	257	8/1/1993	6 to 8	200	NA	NA	NA	NA	NA
100	03-100	6/23/1997	6 to 7	18	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
104	03-104	6/21/1997	18.2 to 19.2	228	26 J	0.01 U	0.01 U	0.87	4.3
105	03-105	6/21/1997	18.3 to 19.3	5 U	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
108	03-108	6/20/1997	16 to 17	5 U	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
602	03-602	2/17/1997	5 to 6.5	16	1.1 U	0.029 U	0.029 U	0.029 U	0.029 U
705	03-705	1/31/1997	21 to 23	13 U	1.3 U	0.032 U	0.032 U	0.032 U	0.032 U
706	03-706	2/3/1997	15 to 17	11 U	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
707	03-707	12/5/1996	14.25 to 16	5 UJ	0.3 U	0.01 UJ	0.01 UJ	0.01 UJ	0.03 U
708	03-708	1/31/1997	3 to 5	13 U	1.3 U	0.031 U	0.034	0.031 U	0.13
709	03-709	3/26/1997	5 to 7	37	1.3 U	0.033 U	0.033 U	0.033 U	0.033 U
			15 to 17	12 U	1.7	0.031 U	0.031 U	0.031 U	0.031 U
710	03-710	3/26/1997	15 to 17	12 U	1.9	0.031 U	0.031 U	0.031 U	0.031 U
711	03-711	3/27/1997	14 to 16	12 U	1.6	0.03 U	0.03 U	0.03 U	0.03 U
712	03-712	3/25/1997	18 to 20	2,700	13 J	0.028 U	0.028 U	0.47 J	2
713	03-713	3/24/1997	19 to 21	1,800	14	0.058 U	0.058 U	0.51	1.8

Table B-3 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
716	03-716	6/23/1997	17.5 to 19.5	21	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
778	03-778	5/12/1997	15 to 16	5.1	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
779	03-779	5/13/1997	3.5 to 3.5	2,400	7.6	0.028 U	0.028 U	0.028 U	0.028 U
			16 to 17	4.4 U	2.7 U	0.027 U	0.027 U	0.027 U	0.027 U
802	03-802	2/18/1997	5 to 6	14 U	4.9	0.034 U	0.034 U	0.034 U	0.047
			14.5 to 16	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
804	03-804	2/15/1997	8 to 9	700	4.5 U	0.11 U	0.11 U	0.11 U	0.61
805	03-805	2/16/1997	7 to 8	94	4.3 U	0.11 U	0.11 U	0.11 U	0.11 U
			17 to 18	10,000	37 J	0.06 U	1.4 J	0.079 J	5.5
807	03-807	6/20/1997	16 to 17	5 U	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
808	03-808	6/20/1997	16 to 17	981	16 J	0.01 U	0.01 U	0.59	2.19
809	03-809	4/28/1997	7 to 9	4.7 U	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
810	03-810	3/29/1997	6 to 8	9,700	19	0.059 U	0.059 U	1	1.7
			16 to 18	12 U	1.2 U	0.03 U	0.03 U	0.03 U	0.03 U
886	03-886	6/20/1997	16 to 17	965	13	0.01 U	0.01 U	0.36	1.9
895	03-895	7/16/1998	17 to 18	4.8 U	3 U	0.03 U	0.12	0.031	0.28
185	04-185	9/23/1996	8 to 10	38	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
			20 to 22	23	0.3 U	0.01 U	0.01 U	0.01 U	0.01 U
186	04-186	9/24/1996	5 to 7	21	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
			19 to 21	15	0.3 U	0.01 U	0.01 U	0.01 U	0.01 U
187	04-187	9/24/1996	18 to 20	12	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
188	04-188	9/24/1996	15 to 17	34	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U

Table B-3 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
871	04-871	7/20/1999	15 to 17	4 U	5 U	0.05 U	0.1 U	0.1 U	0.1 U
			18 to 20	4 U	5 U	0.05 U	0.1 U	0.1 U	0.1 U
880	FS-001	9/30/1996	2 to 2.4	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
881	FS-006	9/30/1996	1.3 to 1.7	12,000 J	29 J	0.27 U	0.27 U	1.3 J	3.2
882	FS-007	9/30/1996	1.3 to 1.7	11,000 J	27 J	0.27 U	0.27 U	1.2 J	4.4
883	FS-008	9/30/1996	2.8 to 3.2	19,000 J	36 J	0.28 U	0.28 U	2.4 J	6.8
884	FS-011	9/30/1996	1.6 to 2	17,000 J	41 J	0.29 U	0.29 U	2 J	4.5
885	FS-012	9/30/1996	2.1 to 2.5	37	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
764	HMW-102-5	8/13/1993	7.5 to 8.5	175	NA	NA	NA	NA	NA
			17.5 to 18.5	30,000 J	NA	NA	NA	NA	NA
765	HMW-102-6	8/13/1993	7.5 to 7.5	36	NA	NA	NA	NA	NA
767	HMW-102-8	8/13/1993	10 to 10	10 U	NA	NA	NA	NA	NA
769	HMW-102-10	8/21/1993	7.5 to 7.5	10 U	NA	NA	NA	NA	NA
			17.5 to 17.5	5,330 J	NA	NA	NA	NA	NA
202	HMW-102-11	8/31/1993	7.5 to 7.5	15	NA	NA	NA	NA	NA
841	HMW-107-2	8/18/1993	5 to 5	10 U	NA	NA	NA	NA	NA
842	HMW-107-3	8/18/1993	12.5 to 12.5	10 U	NA	NA	NA	NA	NA
750	MRP-MW1	8/1/1993	8 to 10	34	NA	NA	NA	NA	NA
			12 to 14	160	NA	NA	NA	NA	NA
			16 to 18	20,000	410	NA	NA	NA	NA
			18 to 20	16	NA	NA	NA	NA	NA
			22 to 24	50	NA	NA	NA	NA	NA

Table B-3 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
751	MRP-MW2	8/1/1993	5 to 7	450	NA	NA	NA	NA	NA
			9 to 11	24	NA	NA	NA	NA	NA
			14 to 15	50 U	NA	NA	NA	NA	NA
			17 to 19	33	43	NA	NA	NA	NA
			21 to 23	50 U	NA	NA	NA	NA	NA
770	RW-102-1	8/14/1996	0	1,070	5 U	0.05 U	0.05 U	0.05 U	0.05 U
850	RW-107-1	8/14/1996	0	72	5 U	0.05 U	0.05 U	0.05 U	0.05 U
851	RW-107-2	8/14/1996	0	333	7	0.05 U	0.05 U	0.05 U	0.05 U
852	RW-107-3	8/14/1996	0	284	5 U	0.05 U	0.05 U	0.05 U	0.05 U
Screening Criteria^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria^b				12,500	1,400	6.4	180	89	81
Screening Criteria^c				230	260	0.02	4.8	5	69

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Table B-3 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-4
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
100	03-100	MW	7/13/1997	50 UJ	5 U	0.2 U	0.2 U	0.2 U	0.2 U
692	03-692	MW	2/11/1997	2,100 J	100 U	1 U	1 U	1 U	3.4
708	03-708	GW	2/5/1997	760	470	4.6 J	10 J	3.3 J	48
752	MRP-MW3	MW	2/5/1997	17,000	23,000	55	1,300	2,600	7,500
			11/5/1997	5,600	37,000 J	5.1	3,700	1,900 J	9,100
			9/3/2001	6,930 UJ	44,100	40 U	5,690	1,860	10,100
<i>Primary Groundwater Unit</i>									
104	03-104	MW	9/3/2001	11,500	199 UJ	0.2 U	0.684	2.24	18.6
108	03-108	MW	8/4/1997	270 J	100 U	1 U	1 U	1 U	1 U
185	04-185	AW	10/18/1996	630	232	0.2 U	2	1	2
186	04-186	MW	10/18/1996	400	147	0.2 U	0.2 U	0.2 U	2
			9/7/1998	400	150	1.7	1 U	3.8	3.3
188	04-188	AW	10/18/1996	250 U	204	0.2 U	0.2 U	0.2 U	2
269	03-269	GB	1/23/1997	2,300	100 U	1 U	1.2	1.4	13
347	03-347	GW	1/2/1997	290 J	930	4.2	3.3	2	2.4
705	03-705	GW	2/4/1997	250 U	100 U	1 U	1 U	1 U	1 U
706	03-706	GW	2/4/1997	250 U	100 U	1 U	1 U	1 U	1 U
707	03-707	GW	12/7/1996	250 U	100 U	1 U	1 U	1 U	1 U
712	03-712	GW	5/1/1997	7,800	130	1 U	3.2	8.4	66
713	03-713	GW	5/1/1997	2,700	100 U	1 U	1 U	1	22
716	03-716	MW	7/14/1997	50 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U
778	03-778	MW	5/16/1997	430	100 U	0.5 U	0.5 U	0.55	1.7
			8/11/1998	200 UJ	100 U	1 U	1 U	1 U	1 U
			9/3/2001	4,620	101	0.238	0.597	8.73	12.8

Table B-4 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
779	03-779	MW	7/14/1997	50 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U
802	03-802	MW	7/14/1997	50 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U
807	03-807	MW	8/6/1997	690	100 UJ	1 U	1 U	1 U	1 U
			9/15/1997	1,100	100 U	1 U	1 U	1 U	1 U
886	03-886	MW	7/30/1997	5,500 J	160	1 U	3.7	17	100
			9/3/2001	6,700	443 J	1.96 J	5.05 J	26.7 J	106 J
895	03-895	MW	8/10/1998	190 U	100 U	1 U	1 U	1 U	1 U
			8/25/1999	NA	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			11/19/1999	180 UJ	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			2/21/2000	150 U	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			10/8/2001	568 U	90 U	0.5 U	2 U	2 U	2U
			10/1/2002	170 U	50 U	1 U	1 U	1 U	3 U
755	CTO124-MW4	MW	2/14/1997	250 U	100 U	1 U	1 U	1 U	1 U
			5/1/1997	260 U	100 U	1 U	1 U	1 U	1 U
760	HMW-102-1	MW	2/13/1997	12,000 J	250	1 U	6.8	9.8	96
			9/3/2001	15,800 J	111 UJ	0.2 U	0.805	2.91	25.2
761	HMW-102-2	MW	8/20/1993	43,000	NA	NA	NA	NA	NA
763	HMW-102-4	MW	8/20/1993	4,310	NA	NA	NA	NA	NA
			2/6/1997	1,000	100 U	1 U	3.5	1 U	11
764	HMW-102-5	MW	8/20/1993	42,000	NA	NA	NA	NA	NA
765	HMW-102-6	MW	8/20/1993	15,000	NA	NA	NA	NA	NA
766	HMW-102-7	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
			2/7/1997	250 U	100 U	1 U	1 U	1 U	1 U
767	HMW-102-8	MW	8/20/1993	280	NA	NA	NA	NA	NA
			2/7/1997	250 U	100 U	1 U	1 U	1 U	1 U

Table B-4 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
768	HMW-102-9	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
			2/7/1997	250 U	100 U	1 U	1 U	1 U	1 U
769	HMW-102-10	MW	8/24/1993	17,300	NA	NA	NA	NA	NA
202	HMW-102-11	MW	9/6/1993	4,030	NA	NA	NA	NA	NA
			11/8/1996	3,500	100 U	1.3	1.7	10	44
840	HMW-107-1	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
			2/12/1997	310 J	100 U	1 U	1 U	1 U	1 U
841	HMW-107-2	MW	8/21/1993	270	NA	NA	NA	NA	NA
			2/12/1997	250 U	100 U	1 U	1 U	1 U	1.6
842	HMW-107-3	MW	8/21/1993	2,200	NA	NA	NA	NA	NA
855	HMW-146-1	MW	9/6/1993	420	NA	NA	NA	NA	NA
			2/15/1997	250 U	280	1 U	1 U	2	1.3
856	HMW-146-2	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
			2/15/1997	250 U	100 U	1 U	1 U	1 U	1 U
750	MRP-MW1	MW	2/5/1997	18,000	620	5 U	28	18	220
			9/3/2001	9,790	359 J	0.435 J	2.02 J	25.6 J	93.3 J
751	MRP-MW2	MW	11/6/1992	8,600	NA	NA	NA	NA	NA
			2/5/1997	3,200	7,500	220	620	20	3,500
			11/5/1997	1,400	9,400 J	180	25	720 J	2,606
			9/3/2001	2,590 UJ	18,200	137	25 U	440	3,040
757	MW-102-4	MW	2/12/1997	16,000 J	410	1 U	1.5	18	80
			9/3/2001	18,700	101	0.2 U	0.5 U	5.03	9
758	MW-102-6	MW	7/2/1993	220,000	NA	NA	NA	NA	NA
7	MW-102-7	LW	7/2/1993	660	NA	NA	NA	NA	NA
759	MW-102-8	AW	7/2/1993	270	NA	NA	NA	NA	NA
9	MW-107-9	LW	7/11/1993	580	NA	NA	NA	NA	NA

Table B-4 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 102, 107, and 146 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
846	MW-107-10	MW	7/2/1993	930	NA	NA	NA	NA	NA
			2/12/1997	250 UJ	100 U	1 U	1 U	1 U	1 U
849	MW-107-13	MW	2/12/1997	14,000	100 UJ	1 U	1 U	1.2	15
858	MW-146-1	MW	7/3/1993	250 U	NA	NA	NA	NA	NA
872	MW-146-3	MW	9/3/2001	15,900	350 UJ	0.4 U	5.34	19.3	72.1
860	MW-146-4	MW	8/3/1997	4,800 J	1,800 UJ	100 U	100 U	100 U	300
			9/3/2001	6,250 J	114 UJ	0.2 U	0.5 U	3.57 J	16.3 J
864	MW-146-8	MW	7/3/1993	500	NA	NA	NA	NA	NA
9	MW-146-9	LW	7/11/1993	320	NA	NA	NA	NA	NA
865	MW-146-11	MW	7/3/1993	11,600	NA	NA	NA	NA	NA
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well
 BTEX - benzene, toluene, ethylbenzene, and xylenes
 DEC - Department of Environmental Conservation
 DRO - diesel-range organics
 GRO - gasoline-range organics
 GW - Geoprobe well
 J - estimated concentration

LW - lost well
 ug/L - microgram per liter
 MW - monitoring well
 NA - not analyzed
 RW - recovery well
 U - not detected at concentration shown

Table B-5
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 114, 116, 160, and 167 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
896	03-896	7/15/1998	13.5 to 14	5 UJ	3.1 U	0.03 U	0.03 U	0.03 U	0.03 U
897	03-897	8/4/1998	17 to 19	4.8 U	3 U	0.03 U	0.03 U	0.03 U	0.03 U
686	HMW-114-1	8/19/1993	7.5 to 7.5	172	NA	NA	NA	NA	NA
689	HMW-116-1	8/19/1993	7.5 to 7.5	10 U	NA	NA	NA	NA	NA
660	HMW-160-1	8/18/1993	7.5 to 7.5	10 U	NA	NA	NA	NA	NA
663	HMW-167-2	8/18/1993	10 to 10	10 U	NA	NA	NA	NA	NA
Screening Criteria^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria^b				12,500	1,400	6.4	180	89	81
Screening Criteria^c				230	260	0.02	4.8	5	69

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-6
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 114, 116, 160, and 167 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
686	HMW-114-1	MW	8/21/1993	250 U	NA	NA	NA	NA	NA
689	HMW-116-1	MW	8/21/1993	320	NA	NA	NA	NA	NA
660	HMW-160-1	MW	8/21/1993	320	NA	NA	NA	NA	NA
664	HMW-167-3	MW	8/21/1993	250 U	NA	NA	NA	NA	NA
			1/24/1997	260 U	100 U	1 U	1 U	1 U	1 U
684	MW-114-1	MW	7/3/1993	740	NA	NA	NA	NA	NA
685	MW-114-5	MW	7/3/1993	250 U	NA	NA	NA	NA	NA
688	MW-116-2	MW	7/3/1993	250 U	NA	NA	NA	NA	NA
3	MW-160-3	AW	7/2/1993	25,000	NA	NA	NA	NA	NA
666	MW-167-2	AW	7/2/1993	250 U	NA	NA	NA	NA	NA
			1/24/1997	240 U	100 U	1 U	1 U	1 U	1 U
667	MW-167-3	AW	7/3/1993	2,060	NA	NA	NA	NA	NA
			1/24/1997	250 U	100 U	1 U	1 U	1 U	1 U
670	MW-167-5	AW	7/11/1993	900	NA	NA	NA	NA	NA
<i>Primary Groundwater Unit</i>									
896	03-896	MW	8/25/1999	NA	20 U	0.2 U	0.3 U	0.2 U	0.6
			11/18/1999	270 UJ	21	0.2 U	0.3 U	0.2 U	0.41
			2/10/2000	480	28	0.2 U	0.3 U	0.2 U	0.46
			7/1/2000	160 UJ	25	0.2 U	0.3 U	0.2 U	0.74 J
			10/8/2001	543 U	90 U	0.5 U	2 U	2 U	2 U
			10/3/2002	160 U	35 J	1 U	1 U	0.64	3 U

Table B-6 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 114, 116, 160, and 167 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
897	03-897	MW	9/5/1998	1,100	120	1.1	1 U	12	8.3
			8/25/1999	NA	65 J	0.98 J	0.3 UJ	15	3.81
			11/19/1999	390 UJ	91	0.76	0.3 U	10	3.4 J
			2/10/2000	160 U	120	0.98	0.3 U	9.9	3.5
			7/1/2000	560 J	150	0.6	0.3 U	14	3.7
			10/8/2001	969	100	0.5 U	2 U	6.92	2.57
			10/2/2002	730	220	0.39 J	1 U	14	5.3
663	HMW-167-2	MW	8/21/1993	250 U	NA	NA	NA	NA	NA
			1/24/1997	270 U	100 U	1 U	1 U	1 U	1 U
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

GW - Geoprobe well

J - estimated concentration

LW - lost well

ug/L - microgram per liter

MW - monitoring well

NA - not analyzed

RW - recovery well

U - not detected at concentration shown

Table B-7
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 134, 179, and 187 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
606	03-606	2/18/1997	10 to 12	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
			15 to 16	11 U	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
609	03-609	2/17/1997	17 to 18	12,000	95	0.15 U	4.3	0.54	16
610	03-610	2/17/1997	3 to 5	56	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
			17 to 19	11 U	1.1 U	0.029 U	0.029 U	0.029 U	0.029 U
619	03-619	2/13/1997	15 to 16	4.9 U	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
630	HMW-134-1	8/18/1993	7.5 to 7.5	46	NA	NA	NA	NA	NA
632	HMW-134-3	8/18/1993	1.5 to 1.5	434	NA	NA	NA	NA	NA
			7.5 to 7.5	133	NA	NA	NA	NA	NA
674	HMW-179-1	8/18/1993	7.5 to 7.5	55	NA	NA	NA	NA	NA
Screening Criteria^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria^b				12,500	1,400	6.4	180	89	81
Screening Criteria^c				230	260	0.02	4.8	5	69

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Table B-7 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 134, 179, and 187 Area

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-8
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 134, 179, and 187 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
639	MW-134-4	AW	7/11/1993	410,000	NA	NA	NA	NA	NA
682	MW-187-2	MW	7/3/1993	790	NA	NA	NA	NA	NA
683	MW-187-3	MW	7/3/1993	1,090	NA	NA	NA	NA	NA
<i>Primary Groundwater Unit</i>									
606	03-606	AW	9/16/1997	200	100 U	1 U	1 U	1 U	1 U
619	03-619	MW	8/25/1999	NA	250	10	2.5	10	11.5
			11/18/1999	240 UJ	420	12	2.4	5.5	11
			2/21/2000	150 U	650	3.9 J	4.8	9	9
			6/28/2000	180 J	1,700	32	43	73	46
			9/2/2001	2,600	124 J	1.34	0.5 U	0.5 U	1 U
			10/8/2001	1,280	203	0.954	2 U	2 U	2 U
	10/1/2002	1,600	250	3.8	1 U	1.3	2.8 J		
649	DW-134-2	RW	9/2/2001	5,840	264	1.14	1 U	9.95	30.6
630	HMW-134-1	MW	8/21/1993	370	NA	NA	NA	NA	NA
631	HMW-134-2	MW	8/21/1993	2,640	NA	NA	NA	NA	NA
			1/23/1997	3,200	3,300	240	200	240	910
			11/10/1997	3,900	4,900 J	250	100 J	400 J	1,140
			11/24/1997	3,400	NA	NA	NA	NA	NA
			9/2/2001	2,870	3,850 J	152	32.2	302	373
632	HMW-134-3	AW	8/20/1993	2,850	NA	NA	NA	NA	NA
			1/23/1997	2,700	100 U	1 U	1 U	13	31

Table B-8 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 134, 179, and 187 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
674	HMW-179-1	AW	8/21/1993	250 U	NA	NA	NA	NA	NA
			1/24/1997	250 U	100 U	1 U	1 U	1 U	1 U
641	MW-134-6	AW	1/23/1997	19,000 J	190	1 U	3.1	11	78
643	MW-134-8	MW	7/3/1993	24,000	NA	NA	NA	NA	NA
644	MW-134-9	MW	7/3/1993	8,030	NA	NA	NA	NA	NA
			1/23/1997	23,000	100 U	1 U	2.5	2.1	8.5
645	MW-134-10	MW	7/3/1993	27,000	NA	57	25 U	74	150
			9/27/1996	2,700	150	4.6 J	2	15	31
			9/2/2001	5,030	689	7.22 J	3.56 J	44.2 J	156 J
646	MW-134-11	MW	7/11/1993	3,600	NA	NA	NA	NA	NA
			9/27/1996	2,600	980 J	65 J	9.9	130	70
			8/11/1998	2,600 J	200	3.7	1 U	1 U	22
			9/2/2001	7,450	214	3.56	1.24	14.3	34.1
675	MW-179-1	AW	7/2/1993	260	NA	NA	NA	NA	NA
677	MW-179-3	AW	7/2/1993	270	NA	NA	NA	NA	NA
4	MW-179-4	AW	7/11/1993	3,600	NA	NA	NA	NA	NA
681	MW-187-1	MW	7/3/1993	5,870	NA	NA	NA	NA	NA
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

Table B-8 (Continued)
**Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 134, 179, and 187 Area**

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

GW - Geoprobe well

J - estimated concentration

LW - lost well

MW - monitoring well

ug/L - microgram per liter

NA - not analyzed

RW - recovery well

U - not detected at concentration shown

Table B-9
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 139 and 184 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
21/22	OX-6-11-21	5/17/1997	13.5 to 14.5	12 U	6.5 U	0.032 U	0.032 U	0.032 U	0.032 U
			15.5 to 16.5	12 U	5.7 U	0.029 U	0.029 U	0.029 U	0.029 U
			16.5 to 17.5	11 U	5.6 U	0.028 U	0.028 U	0.028 U	0.028 U
			18.5 to 19.5	11 U	5.7 U	0.028 U	0.028 U	0.028 U	0.028 U
			19.5 to 20.5	11 U	5.5 U	0.027 U	0.027 U	0.027 U	0.027 U
603	03-603	1/24/1997	3 to 5	5,900	2.8 U	0.028 U	0.028 U	0.028 U	0.028 U
604	03-604	12/6/1996	21 to 23	4.8 U	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
695	03-695	7/2/1999	2 to 4	4,120	5 U	0.05 U	0.1 U	0.1 U	0.1 U
			5.5 to 6	257	5 U	0.05 U	0.1 U	0.1 U	0.1 U
			16 to 18	10 U	5 U	0.05 U	0.1 U	0.1 U	0.1 U
			18 to 19	12,000	60	0.2 U	0.4 U	0.7	2.7
696	03-696	7/2/1999	16 to 18	10 U	5 U	0.05 U	0.1 U	0.1 U	0.1 U
			18 to 19	12,000	60	0.2 U	0.4 U	0.7	2.7
652	HMW-139-2	8/17/1993	16 to 16	31,000 J	NA	NA	NA	NA	NA
857	HMW-146-3	8/17/1993	7.5 to 7.5	326	NA	NA	NA	NA	NA
678	HMW-184-1	8/18/1993	7.5 to 7.5	11	NA	NA	NA	NA	NA
679	HMW-184-2	8/21/1993	12.5 to 12.5	847 J	NA	NA	NA	NA	NA
Screening Criteria ^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria ^b				12,500	1,400	6.4	180	89	81
Screening Criteria ^c				230	260	0.02	4.8	5	69

Table B-9 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 139 and 184 Area

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-10
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 139 and 184 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
603	03-603	GW	1/27/1997	500	100 U	1 U	1 U	1 U	1 U
695	03-695	MW	11/17/1999	210	20 U	0.2 U	0.3 U	0.2 U	0.2
			2/27/2000	160 U	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			10/8/2001	959	90 U	0.5 U	2 U	2 U	2 U
			10/2/2002	740	50 U	1 U	1 U	1 U	3 U
680	MW-184-2	AW	7/3/1993	7,630	NA	NA	NA	NA	NA
<i>Primary Groundwater Unit</i>									
604	03-604	GW	12/7/1996	250 U	100 U	1 U	1 U	1 U	1 U
696	03-696	MW	2/25/2000	150 U	110 J	0.2 U	0.3 U	0.84 J	1.1 J
			9/2/2001	1,870	162 UJ	0.2 U	0.5	9.19	28.8
			10/8/2001	1,980	394	0.5 U	2 U	17.8	38
			10/2/2002	780	520	1 U	1 U	16	65
697	03-697	MW	10/14/2001	556 U	90 U	0.5 U	2 U	2 U	2 U
			10/2/2002	160 U	7 J	1 U	1 U	1 U	3 U
652	HMW-139-2	MW	8/22/1993	51,000	NA	NA	NA	NA	NA
			1/23/1997	7,700	330	14	4.9	43	230
			11/8/1997	NA	564 J	6.9	5 U	53	230
			9/2/2001	8,940	961	19.4	4.32	43.4	193
653	HMW-139-3	MW	8/20/1993	410	NA	NA	NA	NA	NA
654	HMW-139-4	MW	9/6/1993	350	NA	NA	NA	NA	NA
			9/2/2001	178	50 U	0.2 U	0.5 U	0.5 U	1 U

Table B-10 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples,
SWMU 62, New Housing Fuel Leak Site, Sandy Cove Housing 139 and 184 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
857	HMW-146-3	MW	8/22/1993	1,620	NA	NA	NA	NA	NA
			2/15/1997	2,300	100 U	1 U	1 U	1 U	1.4
			9/2/2001	2,070	50 U	0.2 U	0.5 U	0.5 U	1.07
678	HMW-184-1	MW	8/24/1993	250 U	NA	NA	NA	NA	NA
679	HMW-184-2	MW	8/24/1993	11,300	NA	NA	NA	NA	NA
656	MW-139-2	MW	7/2/1993	250 U	NA	NA	NA	NA	NA
3	MW-139-3	LW	7/2/1993	57,000	NA	NA	NA	NA	NA
657	MW-139-6	MW	7/2/1993	420	NA	NA	NA	NA	NA
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

GW - Geoprobe well

J - estimated concentration

LW - lost well

MW - monitoring well

µg/L - microgram per liter

NA - not analyzed

RW - recovery well

U - not detected at concentration shown

Table B-11
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
12	03-012	8/22/1998	5.5 to 6	4.9 U	3 U	0.03 U	0.03 U	0.03 U	0.03 U
101	03-101	6/18/1997	17.5 to 18.5	15,000	150	0.01 U	0.3	2	10
102	03-102	6/18/1997	10 to 11	8,600	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
103	03-103	6/18/1997	12.5 to 13.5	11	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
107	03-107	6/18/1997	22.5 to 23.5	7,500 J	79	0.01 U	0.01 U	0.41	5.1
109	03-109	6/23/1997	25 to 25.5	5 U	0.3 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.03 U
154	03-154	3/31/1998	21 to 24	1,400	2.5	0.02 U	0.02 U	0.02	0.15
501	03-501	2/19/1997	3 to 5	12 U	1.2 U	0.03 U	0.03 U	0.03 U	0.03 U
502	03-502	2/15/1997	24 to 26	120	110	0.032 U	0.49 J	0.27 J	0.77
503	03-503	5/8/1997	10 to 12	13 U	1.3 U	0.031 U	0.031 U	0.031 U	0.031 U
504	03-504	2/15/1997	4 to 5	11 U	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
505	03-505	4/30/1997	4 to 6	5 U	3 U	0.03 U	0.03 U	0.03 U	0.03 U
506	03-506	5/8/1997	9 to 11	13 U	1.3 U	0.032 U	0.032 U	0.032 U	0.032 U
507	03-507	6/9/1997	19 to 21	5 U	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
508	03-508	2/17/1997	21 to 23	11 U	1.1 U	0.029 U	0.029 U	0.029 U	0.029 U
510	03-510	2/18/1997	21 to 23	12 U	1.2 U	0.031 U	0.031 U	0.031 U	0.031 U
511	03-511	2/15/1997	23 to 25	4,700	20 J	0.064 U	0.73 J	0.064 U	3.6
512	03-512	2/19/1997	23 to 24	15,000	81	0.14 U	2.6	0.22	14
513	03-513	2/18/1997	0.5 to 1	13	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
			2.5 to 3	11 U	1.1 U	0.028 U	0.028 U	0.028 U	0.028 U
			5 to 7	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
514	03-514	2/18/1997	0.5 to 1.2	41	1.2 U	0.029 U	0.029 U	0.029 U	0.029 U
			2.5 to 3.5	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
			5 to 6	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
517	03-517	5/5/1997	18 to 20	4,800	17	0.055 U	0.062	0.19	1.2
518	03-518	4/28/1997	25 to 27	240	14	0.031 U	0.031 U	0.063	0.66

Table B-11 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Sampling Date	Depth Range (feet bgs)	Diesel-Range Organics (mg/kg)	Gasoline-Range Organics (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
522	03-522	4/29/1997	24 to 26	61	3 U	0.03 U	0.03 U	0.03 U	0.03 U
559	03-559	5/1/1997	0 to 1	12	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
560	03-560	4/30/1997	4 to 6	4.7 U	2.8 U	0.028 U	0.028 U	0.028 U	0.028 U
561	03-561	5/1/1997	9 to 11	1,900	2.9 U	0.029 U	0.029 U	0.029 U	0.029 U
562	03-562	5/2/1997	9 to 11	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
563	03-563	5/2/1997	14 to 16	18,000	51	0.15 U	0.24	1.2	2.1
564	03-564	5/3/1997	8 to 10	11 U	1.1 U	0.027 U	0.027 U	0.027 U	0.027 U
			15 to 17	13 U	1.3 U	0.031 U	0.031 U	0.031 U	0.031 U
565	03-565	5/3/1997	15 to 17	1,200	11	0.063 U	0.063 U	0.16	1.3
898	03-898	7/17/1998	12.5 to 13	31	2.9 U	0.03 U	0.03 U	0.03 U	0.03 U
617	28-617	12/4/1996	4 to 6	12 J	0.3 U	0.01 U	0.01 U	0.01 U	0.03 U
621	28-619	12/10/1996	1.75 to 2.5	4.5 U	NA	NA	NA	NA	NA
620	28-620	12/10/1996	0.5 to 1.1	6.2	NA	NA	NA	NA	NA
575	HMW-303-5	8/10/1993	7.5 to 7.5	11 U	NA	NA	NA	NA	NA
576	HMW-303-6	8/10/1993	7.5 to 7.5	10 U	NA	NA	NA	NA	NA
582	HMW-303-12	8/31/1993	2.5 to 2.5	964	NA	NA	NA	NA	NA
Screening Criteria^a				8,250	1,400	120	17,000	8,300	166,000
Screening Criteria^b				12,500	1,400	6.4	180	89	81
Screening Criteria^c				230	260	0.02	4.8	5	69

^aAlaska DEC Method 2 soil criteria for human ingestion.

^bAlaska DEC Method 2 soil criteria for human inhalation.

^cAlaska DEC Method 2 soil criteria to prevent migration to groundwater.

Table B-11 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Soil Samples,
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Notes:

Shading indicates detected concentrations that exceed the most stringent Alaska DEC Method 2 soil criteria.

bgs - below ground surface

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated concentration

mg/kg - milligram per kilogram

NA - not analyzed

U - not detected at concentration shown

Table B-12
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
<i>Perched Groundwater</i>									
501	03-501	GW	4/30/1997	280 U	100 U	1 U	1 U	1 U	1 U
<i>Primary Groundwater Unit</i>									
12	03-012	MW	10/14/1998	200 U	100 U	1 U	1 U	1 U	1 U
			8/25/1999	NA	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			11/18/1999	160 UJ	20 U	0.2 U	0.3 U	0.2 U	0.2
			2/14/2000	160 UJ	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			7/4/2000	160 UJ	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			9/4/2001	100 U	50 U	0.2 U	0.5 U	0.5 U	1 U
			10/4/2001	549 U	90 U	0.5 U	2 U	2 U	2 U
			10/1/2002	160 U	50 U	1 U	1 U	1 U	3 U
103	03-103	MW	10/22/1997	12,000	298	5 U	5 U	19	86
			9/4/2001	744	50 U	0.2 U	0.5 U	0.5 U	3.5
107	03-107	MW	1/14/1998	3,000	10,000	21	1,100	730	2,000
			9/3/2001	19,300	10,600	82.1	938	712	1,820
109	03-109	MW	1/13/1998	260	100 U	1 U	1 U	1 U	1 U
			8/26/1999	NA	28	0.2 U	0.3 U	0.2 U	0.44
			11/18/1999	290 UJ	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			2/27/2000	150 U	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			7/10/2000	160 UJ	20 U	0.2 UJ	0.3 U	0.2 U	0.2
			9/4/2001	100 U	50 U	0.2 U	0.5 U	0.5 U	1 U
			10/4/2001	588 U	90 U	0.5 U	2 U	2 U	2 U
			10/2/2002	160 U	6.1 J	1 U	1 U	1 U	3 U

Table B-12 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
502	03-502	GW	1/14/1998	1,700	1,400	1 U	2.5	12	36
503	03-503	AW	5/15/1997	250 U	100 U	1 U	1 U	1 U	1 U
504	03-504	AW	4/29/1997	280 U	100 U	1 U	1 U	1 U	1 U
505	03-505	AW	5/14/1997	260 U	100 U	1 U	1 U	1 U	1 U
			7/13/1998	240 U	100 U	1 U	1 U	1 U	1 U
506	03-506	AW	5/30/1997	250 U	100 U	1 U	1 U	1 U	1 U
508	03-508	AW	4/30/1997	280 U	100 U	1 U	1 U	1 U	1 U
510	03-510	AW	4/29/1997	280 U	100 U	1 U	1 U	1 U	1 U
517	03-517	AW	5/31/1997	5,800	600	6.4	5 U	43	170
			10/14/1997	3,150,000 J	1,180	6.2 J	12 J	45 J	208
522	03-522	MW	5/15/1997	3,500	100 U	1 U	1 U	1 U	24
559	03-559	AW	5/16/1997	250 U	100 U	0.5 U	0.5 U	0.5 U	0.5 U
560	03-560	AW	5/16/1997	260 U	100 U	0.5 U	0.5 U	0.5 U	0.5 U
561	03-561	AW	5/16/1997	250 U	100 U	0.5 U	0.5 U	0.5 U	0.5 U
562	03-562	GW	5/31/1997	250 U	100 U	1 U	1.2	1 U	1.4
			9/4/2001	100 U	50 U	0.2 U	0.5 U	0.5 U	1 U
563	03-563	AW	5/16/1997	7,500	180	2.7	0.6 U	6	33
564	03-564	GW	5/30/1997	2,500	100 U	1 U	1 U	1 U	6.9
565	03-565	GW	5/31/1997	800	100 U	1 U	1 U	1 U	20
898	03-898	MW	8/10/1998	200 U	100 U	1 U	1 U	1 U	1 U
			8/27/1999	NA	27 J	0.2 U	0.3 U	0.2 U	0.4 U
			11/19/1999	160 UJ	33	0.2 U	0.3 U	0.2 U	0.4 U
			2/21/2000	150 U	20 U	0.2 U	0.3 U	0.2 U	0.4 U

Table B-12 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
			6/26/2000	160 UJ	20 U	0.2 U	0.3 U	0.2 U	0.4 U
			9/4/2001	135	50 U	0.2 U	0.5 U	0.5 U	1 U
			10/4/2001	581 U	90 U	0.5 U	2 U	2 U	2 U
617	28-617	AW	12/7/1996	840	3,600	97	110	160	250
553	AMW-704	MW	8/27/1993	250 U	250 U	1 U	1 U	1 U	2 U
			2/13/1997	240 UJ	100 U	1 U	1 U	1 U	1 U
			7/13/1998	540	100 U	1 U	1 U	2.6	8.9
			8/27/1999	NA	88 J	0.2 U	0.3 U	1.5 J	17
			11/20/1999	370 UJ	42	0.2 U	0.3 U	0.67	5.8 J
			2/14/2000	340 J	48	0.2 U	0.3 U	0.54	4.2
			7/3/2000	480 J	82	0.2 U	0.3 U	0.78	11.3
			9/4/2001	4,170	150	0.337	0.5 U	1.51	15.6
			10/4/2001	2,110	101	0.5 U	2 U	2.74	7.59
			10/1/2002	1,200	99	0.39 J	1 U	6.5	7.6
554	CTO124-MW13	MW	2/13/1997	500 J	100 U	1 U	1 U	1 U	1 U
			7/13/1998	780	100 U	1 U	1 U	1 U	5.7
555	CTO124-MW14	MW	2/13/1997	770 J	100 U	1 U	1 U	1 U	2.8
			7/13/1998	1,900	100 U	1.4	1 U	2.3	2.6
556	CTO124-MW15	MW	2/13/1997	14,000 J	120	1.6	1 U	8.9	70
			11/9/1997	5,000	262	5 U	5 U	9.7 J	28
			9/3/2001	9,820	551	1.16	3.48	23.9	136
571	HMW-303-1	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
			9/4/2001	313	50 U	0.2 U	0.5 U	0.5 U	1 U

Table B-12 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
572	HMW-303-2	MW	2/17/1997	23,000	180	1.5	20	3.2	86
			9/4/2001	13,900 J	551	0.92	0.754	4.44	58.5
573	HMW-303-3	MW	8/20/1993	550	NA	NA	NA	NA	NA
			2/17/1997	4,500	100 U	1 U	2.3	1.0	21
574	HMW-303-4	MW	9/4/2001	19,900	421	1 U	3.56	6.72	33.4
576	HMW-303-6	MW	4/29/1997	9,900	1,100	10 U	14	100	400
577	HMW-303-7	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
578	HMW-303-8	MW	8/20/1993	250 U	NA	NA	NA	NA	NA
579	HMW-303-9	MW	9/4/1993	3,940	NA	NA	NA	NA	NA
580	HMW-303-10	MW	9/4/1993	660	NA	NA	NA	NA	NA
			2/13/1997	1,500	100 U	1 U	1 U	1 U	1 U
			9/4/2001	4,850	60.3	1.99	0.5 U	3.84	3.93
581	HMW-303-11	MW	9/6/1993	11,300	NA	NA	NA	NA	NA
582	HMW-303-12	MW	9/4/1993	330	NA	NA	NA	NA	NA
550	MRP-MW4	MW	11/6/1992	4,200	NA	NA	NA	NA	NA
			7/5/1993	2,160	NA	NA	NA	NA	NA
4	MW-303-4	LW	7/1/1993	55,000	NA	NA	NA	NA	NA
540	MW-303-13	MW	7/1/1993	250 U	NA	NA	NA	NA	NA
			9/4/2001	100 U	50 U	0.2 U	0.5 U	0.5 U	1 U
541	MW-303-14	MW	7/1/1993	910	NA	NA	NA	NA	NA
542	MW-303-15	MW	7/1/1993	250 U	NA	NA	NA	NA	NA
543	MW-303-16	MW	7/3/1993	250 U	NA	NA	NA	NA	NA
			9/3/2001	100 U	50 U	0.2 U	0.5 U	0.5 U	1 U

Table B-12 (Continued)
Summary of Analytical Results for DRO, GRO, and BTEX in Groundwater Samples
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location ID	Location Cross-Reference	Location Type	Sampling Date	Diesel-Range Organics (ug/L)	Gasoline-Range Organics (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
544	MW-303-17	MW	7/2/1993	2,030	NA	NA	NA	NA	NA
			9/4/2001	155	50 U	0.2 U	0.5 U	0.5 U	1 U
545	MW-303-18	MW	7/1/1993	20,700	NA	NA	NA	NA	NA
Cleanup Criteria^a				1,500	1,300	5	1,000	700	10,000

^a Alaska DEC criteria for groundwater used as a drinking water source

Notes:

Shading indicates detected concentrations that exceed Alaska DEC criteria for groundwater used as a drinking water source

AW - abandoned well

BTEX - benzene, toluene, ethylbenzene, and xylenes

DEC - Department of Environmental Conservation

DRO - diesel-range organics

GRO - gasoline-range organics

GW - Geoprobe well

J - estimated concentration

LW - lost well

MW - monitoring well

µg/L - microgram per liter

NA - not analyzed

RW - recovery well

U - not detected at concentration shown

Table B-13
Summary of Analytical Results for Sediment Samples from the East Canal
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location Number Location Cross-Reference Sample Date Sample Depth (feet bgs) Units	754 E DITCH (N T-1451) 8/29/1997 0 to 0.33 (mg/kg)	618 28-618 12/4/1996 0.3 to 0.5 (mg/kg)
Petroleum Hydrocarbons		
Gasoline-range organics	5 U	0.3 U
Diesel-range organics	1,660	215 J
Residual-range organics	280 J	102 J
BTEX		
Benzene	0.05 U	0.01 UJ
Ethylbenzene	0.1 U	0.01 UJ
Toluene	0.1 U	0.01 UJ
Xylenes (total)	0.1 U	0.03 U
Noncarcinogenic PAHs		
2-Methylnaphthalene	0.2 U	0.2 U
Acenaphthene	0.2 U	0.3
Acenaphthylene	0.2 U	0.2 U
Anthracene	0.2 U	0.4
Benzo(g,h,i)perylene	0.2 U	0.3
Fluoranthene	0.2 U	1.5
Fluorene	0.2 U	0.3
Naphthalene	0.2 U	0.2 U
Phenanthrene	0.2 U	1.6
Pyrene	0.2 U	1.1
Carcinogenic PAHs		
Benzo(a)anthracene	0.2 U	0.5
Benzo(a)pyrene	0.2 U	0.5
Benzo(b)fluoranthene	0.2 U	0.5
Benzo(k)fluoranthene	0.2 U	0.5
Chrysene	0.2 U	0.6
Dibenz(a,h)anthracene	0.2 U	0.2 U
Indeno(1,2,3-cd)pyrene	0.2 U	0.4

Notes:

- bgs - below ground surface
- BTEX - benzene, toluene, ethylbenzene, and xylenes
- J - estimated concentration
- mg/kg - milligram per kilogram
- PAH - Polycyclic Aromatic Hydrocarbons
- NA - not analyzed
- U - not detected at concentration shown

Table B-14
Summary of Analytical Results for Surface Water Samples from the East Canal
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

Location Number Location Cross-Reference Sample Date Sample Depth (feet bws) Units	513 CH-703 7/20/1997 0 (ug/L)	513 CH-703 7/20/1997 1 (ug/L)
Petroleum Hydrocarbons		
Gasoline-range organics	100 U	100 U
Diesel-range organics	250 UJ	250 UJ
Residual-range organics	NA	NA
Volatile Organic Compounds		
Benzene	0.78 J	0.86 J
Ethylbenzene	2.9	3.1
Toluene	2.3	2.5
Xylenes (total)	5.4	6
Total aromatic hydrocarbons (TAH) ^a	11.4	12.5
cis-1,2-Dichloroethene	0.94 J	1.1
All other VOCs	< 5 U	< 5 U
Noncarcinogenic PAH		
2-Methylnaphthalene	5 U	5 U
Acenaphthene	5 U	5 U
Acenaphthylene	5 U	5 U
Anthracene	5 U	5 U
Benzo(g,h,i)perylene	5 U	5 U
Fluoranthene	5 U	5 U
Fluorene	5 U	5 U
Naphthalene	5 U	5 U
Phenanthrene	5 U	5 U
Pyrene	5 U	5 U
Carcinogenic PAH		
Benzo(a)anthracene	5 U	5 U
Benzo(a)pyrene	5 U	5 U
Benzo(b)fluoranthene	5 U	5 U
Benzo(k)fluoranthene	5 U	5 U
Chrysene	5 U	5 U
Dibenz(a,h)anthracene	5 U	5 U
Indeno(1,2,3-cd)pyrene	5 U	5 U
Total aqueous hydrocarbons (TAqH) ^b	13.9	15
All other SVOCs	< 20 U	< 20 U

Table B-14 (Continued)
Summary of Analytical Results for Surface Water Samples from the East Canal
SWMU 62, New Housing Fuel Leak Site, Eagle Bay Housing 303 Area

^a TAH means the sum of benzene, toluene, ethylbenzene, and total xylene concentrations. One half the reported detection limit is used for compounds reported as not detected.

^b TAqH means the sum of TAH and PAH concentrations. One half the reported detection limit is used for compounds reported as not detected.

Notes:

bws - below water surface

J - estimated concentration

NA - not analyzed

PAH - Polycyclic Aromatic Hydrocarbons

SVOCs - Semivolatile Organic Compounds

TAH - total aromatic hydrocarbons

TAqH - total aqueous hydrocarbons

U - not detected at concentration shown

µg/L - microgram per liter

VOCs - Volatile Organic Compounds