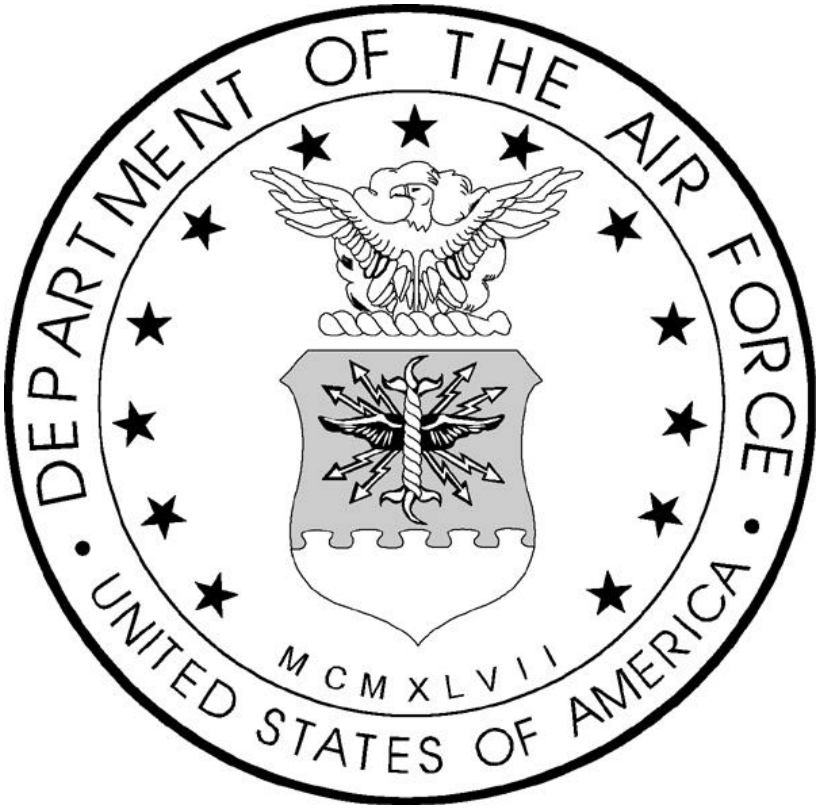

INSTALLATION RESTORATION PROGRAM

RECORD OF DECISION FOR FINAL REMEDIAL ACTION NAKNEK RIVER STORAGE SITES, LANDFILL NO. 5, AND ZONE 4 GROUNDWATER KING SALMON AIRPORT, ALASKA

APRIL 1999

UNITED STATES AIR FORCE

611th Air Support Group

611th Civil Engineer Squadron

21885 Second Street

Elmendorf AFB, Alaska 99506-4420

RECORD OF DECISION
FOR
FINAL REMEDIAL ACTION

NAKNEK RIVER STORAGE SITES,
LANDFILL NO. 5, AND ZONE 4 GROUNDWATER
KING SALMON AIRPORT
KING SALMON, ALASKA

DECLARATION,
DECISION SUMMARY,
AND
RESPONSIVENESS SUMMARY

TECHNICAL DOCUMENT TO SUPPORT
INSTALLATION RESTORATION DECISION

DECLARATION

SITE NAME AND LOCATION

Installation Restoration Program Site
Site SS012, Naknek River Storage
Site LF008, Landfill No. 5 – a capped landfill
Site OT030, Groundwater Zone 4
King Salmon, Alaska

STATEMENT OF BASIS

This decision is based on information contained in the Administrative Record, including but not limited to the results of Installation Restoration Program (IPP) Records Search, a Limited Field Investigation, and a Remedial Investigation/Feasibility Study conducted at King Salmon, AK, with reports dated 1994 and 1995, respectively.

This Decision Document (DD) presents the selected remedial actions for the above listed sites. This DD has been developed in accordance with the Defense Environmental Restoration Program (DERP), 10 United States Code (USC) 2701, consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC 9601 and Executive Order 12580 (52 Federal Register 2923), and to the extent practicable with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300.

ASSESSMENT OF THE SITE(S)

Based on the current conditions at IRP sites SS012, LF008, and OT030, it has been determined that actual or threatened releases of hazardous substances including fuels, fuel constituents, and solvents from these sites, if not addressed by implementing the response actions selected in this DD, could present an imminent or substantial endangerment to public health, welfare, or the environment. Specific hazardous substances include diesel-range organics (DRO) and volatile organic compounds (VOCs) including gasoline-range organics (GRO), benzene, toluene, and trichloroethylene (TCE).

DESCRIPTION OF THE SELECTED REMEDY

For IRP Sites SS012, LF008, and OT030, the selected remedies were chosen from many alternatives as the best methods for addressing contaminated soil, sediment, groundwater, and surface water. The remedies address the risk to health or the environment caused by hypothetical exposure of a future resident to contaminated surface soil, sediment, groundwater, and surface water. The selected remedies address this risk by reducing DRO and VOC contamination to below the cleanup levels established for the Sites.

Remedial Action Goals for Zone 4

				Screening Concentrations				
Media	**Contaminants of Concern**	**Maximum Concentration (1992 to present)**	**Maximum Concentration (1997 or 1998 Sampling)**	**Ecological Risk-Based RG[a]**	**Human Health Risk-Based RG[b]**	**ARARs RG**	**ARARs Basis**	**Cleanup Levels**
A-Aquifer	Benzene	480	97.3	NC	NC	5	ADWS	5
Groundwater	Toluene	1,830	1,830	NC	NC	1000	ADWS	1,000
(µg/L)	TCE	79	9.8	NC	NC	5	ADWS	5
	GRO	7,700	7,700	NC	NC	NONE	N/A	1,300[f]
	DRO	61,000	13,500	NC	NC	NONE	N/A	1,500[f]
Surface Water	TAH (BTEX)[c]	245[e]	5.1	NC	NC	10	AWQS	10
(µg/L)	TAqH (BTEX+PAH)	245[e]	5.1	NC	NC	15	AWQS	15
	DRO	1,500,000[e]	770	NC	NC	NONE	N/A	1,500[f]
Soil	Benzo(a)anthracene	22	0.32	3.52	22	NONE	N/A	3.5
mg/kg	Benzo(a)pyrene	14	0.44	2.24	1.8	NONE	N/A	1.8
	Benzo(b)fluoranthene	16	0.47	2.56	16	NONE	N/A	2.6
	Benzo(k)fluoranthene	14	0.47	2.24	17.5	NONE	N/A	2.24
	Indeno(1,2,3-cd)pyrene	8	0.089	NC	4	NONE	N/A	4
	DRO mg/kg	58,000[e]	13,800	NC	NC	NONE	N/A	2,500[f]

[a]Ecological risk-based RG was calculated only for surface soil. Surface water is regulated by AWQC and ADWS. Subsurface soil is not an exposure pathway.
[b]Concentrations based on 10^{-5} risk
[c]TAH are defined as the sum of BTEX compounds
[d]TAqH are defined as the sum of TAH plus PAHs, as detected by EPA Method 610. The list of PAHs includes: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,I)perylene.
[e]Sample containing these analytical results were collected from the most highly impacted area within the Upper Naknek petroleum hydrocarbon seep, as determined visually. The next highest DRO detection in site soil was 13,800 mg/kg along the pipeline corridor at the eastern edge of Zone 4. The next highest DRO detection in site surface water was 2,700 µg/L in a sample downgradient of Lower Naknek seep. No other surface water samples have exceeded TAH or TAqH standards.
[F]Basis for the GRO and DRO cleanup levels is 18AAC75 method two. The soil DRO cleanup level is based on the "ten times" rule, which allows the migration to groundwater soil cleanup level (250 mg/kg) to be multiplied by ten in instances where the groundwater will not be used as a drinking water source. This ROD establishes that institutional controls will be used to ensure that groundwater is not used, therefore the 10 times rule is applicable.

Definitions:
ADWS - Alaska Drinking Water Standards RG - Remediation goal AWQS - Alaska Water Quality Standards
BTEX - Sum of benzene, toluene, ethylbenzene, and xylene isomers
DRO - Diesel-range organics
NC - Not calculated. Either not a primary risk contributing chemical for this pathway or the chemical was not detected
N/A – The basis for the ARAR is not applicable when no ARAR exists.
TAqH - Total aqueous hydrocarbons (BTEX + PAH) TAH - Total aromatic hydrocarbons (BTEX)
PAH - Polynuclear aromatic hydrocarbons TCE - Trichloroethene

The selected remedies Site SS012 and OT030 are:

GROUNDWATER AND SURFACE WATER

- Groundwater and surface water will be monitored annually to evaluate reduction of the contaminant concentrations by intrinsic remediation. Once contaminant levels in a sampling location are below cleanup levels, the location will be sampled two more times. If no additional contamination is detected above cleanup levels, the monitoring will be discontinued. The cleanup level for both benzene and TCE in groundwater is 5

micrograms per liter (μg/L), the cleanup level for toluene is 1,000 μg/L, the cleanup level for DRO is 1,500 μg/L, and the cleanup level for GRO is 1,300 μg/L.

- Groundwater use restrictions are necessary to prevent installation of groundwater supply wells within designated plumes within Zone 4. Upon acceptance of this DD, an order will be issued by the Commander, 611th Air Support Group, prohibiting the construction of wells for any purposes other than groundwater monitoring within Zone 4 until three consecutive monitoring events indicate that cleanup levels have been achieved.
- Recoverable quantities of free product found to be migrating along the top of the groundwater table toward a surface water seep will be intercepted before discharge to the wetlands. Existing product recovery systems will be operated and maintained to remove the free product until no free product is detected by the monitoring program. The free product will be collected and removed using a passive system such as absorbent booms. Recovered product will be utilized for energy recovery or otherwise disposed of consistent with State and Federal regulations.

SOIL

- Soil with DRO contamination above the cleanup level of 2,500 milligrams per kilogram (mg/kg) will be left in-situ (in-place). Groundwater, surface water, and sediments will be monitored annually to evaluate reduction of the contaminant concentrations in soil by intrinsic remediation. Annual monitoring will be discontinued if contaminant levels are below cleanup levels during three consecutive monitoring results. In-situ bioventing of contaminated soils will be implemented after year five if monitoring data indicate that intrinsic remediation will not achieve cleanup levels in site soil and groundwater.
- The landfill cap has already been contoured and vegetated. The cap will be inspected in the spring and fall of each year for evidence of erosion. Existing monitoring wells are downgradient from the landfill. The primary purpose of these wells is documentation of intrinsic remediation process. The wells will also provide a secondary function of monitoring for landfill leachate.
- The institutional control program implemented by the USAF to prohibit the construction of wells for purposes other than groundwater monitoring in Zone 4 will also include the prohibition of soil excavations within Zone 4.
- In situ bioventing may be implemented in areas where significant concentrations of petroleum are present. Bioventing would be started only if the monitoring data indicate that RAOs are not likely to be reached within 25 years. Five years of monitoring data will be collected before evaluating the need for bioventing.

DECLARATION AND STATUTORY DETERMINATIONS

The selected remedies are protective of human health and the environment, comply with federal and state requirements that are legally applicable or relevant and appropriate and are cost-effective. These remedies utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element for soil, sediment, surface water, and groundwater.

Because contaminants will be remaining on-site above health-based levels, a review will be conducted within five years after commencement of remedial action.

William J. Heinen — 16 Jun 99

William Heinen, Colonel, USAF
Commander, 611th Air Support Group
United States Air Force

Date

The State of Alaska concurs with this Decision Document

Lynn J. Tomich Kent — 3/25/99

Lynn J. Tomich Kent
Contaminated Sites Program Manager
Alaska Department of Environmental Conservation

Date

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FINAL REMEDIAL ACTION

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AND
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DECISION SUMMARY

AND

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Prepared by

United States Air Force
611th Civil Engineer Squadron
21885 Second Street
Elmendorf AFB, Alaska 99506-4420

April 1999

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ABBREVIATIONS AND ACRONYMS

611 CES	611th Civil Engineer Squadron
AAC	Alaska Air Command
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
ARARs	Applicable or Relevant and Appropriate Requirements
AST	Aboveground Storage Tank
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
COPCs	Contaminants of Potential Concern
CRP	Community Relations Plan
DRO	Diesel-Range Organics
DWS	Drinking Water Standards
ES	Engineering Science (Parson)
FAA	Federal Aviation Administration
FS	Feasibility Study
HDPE	High-Density Polyethylene
HI	Hazard Index
HVOC	Halogenated Volatile Organic Compound
IRP	Installation Restoration Program
KSA	King Salmon Airport
LFI	Limited Field Investigation
MCL	Maximum Contaminant Level
MEK	Methyl Ethyl Ketone
MRL	Method Reporting Limit
NCP	National Contingency Plan
OSHA	Occupational Safety and Health Act
PCB	Polychlorinated biphenyl
POL	Petroleum, Oil, and Lubricants
PRG	Preliminary Remediation Goals
RAO	Remedial Action Objectives

ABBREVIATIONS AND ACRONYMS (Continued)

RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RPM	Remedial Program Manager
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorization Act
SVOCs	Semivolatile Organic Compounds
TCE	Trichloroethylene
TSCA	Toxic Substances Control Act
USAF	United States Air Force
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WRBC	Water Risk Based Concentration

UNITS OF MEASURE

mg/Kg	Milligrams Analyte per Kilogram of Sample
µg/Kg	Micrograms Analyte per Kilogram of Sample
µg/L	Micrograms Analyte per Liter of Sample
mg/L	Milligrams Analyte per Liter of Sample

DEFINITIONS

611 CES: The civil engineering squadron based at Elmendorf Air Force base responsible for managing and implementing the environmental restoration program at King Salmon Airport. The 611 CES is part of the Pacific Air Command (PAC).

ADEC: The Alaska Department of Environmental Conservation, the regulatory agency for the King Salmon Airport sites.

Attenuation: Natural chemical, physical, or biological processes that reduce or eliminate contaminant concentrations. This method has been relied upon to treat soil, surface water, and groundwater.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund.

Ecological Risk Assessment: A study of the risks to plants and animals that can be attributed to site contamination.

EPA Region 10: The states of Alaska, Washington, Oregon, and Idaho comprise EPA Region 10.

Fuel Constituents: Diesel, gasoline, and jet fuel. These fluids are composed of a number of chemicals. Some of the chemicals in the fuel will volatilize or degrade faster than other chemicals, leaving a solution that slightly differs from the original fuels.

Human Health Risk Assessment: A study of the risks to human health that can be attributed to site contamination. The study can be divided into cancer risks and non-cancer risks.

Institutional Controls: Physical or legal barriers such as fences and deed restrictions that limit access to contaminated areas. They can be applied in a variety of forms to groundwater, soil, and surface water.

Intrinsic Remediation (Natural Attenuation): A natural process where naturally occurring attenuation mechanisms, such as biodegradation, reduce the total mass of contaminant present.

IRA (Interim Remedial Action) : A remedial action taken prior to completion of a comprehensive evaluation of the site risks and final cleanup alternatives.

Leachate: Water that has dissolved or mobilized contamination from buried waste or soil.

MCLs (Maximum Contaminant Levels): Federal drinking water standards established by the EPA.

Modifying criteria: One of three criteria groups used to select a remediation remedy. State and community acceptance are modifying criteria that shall be considered in remedy selection.

Monitoring: Measurements of soil, surface water, and groundwater taken to determine the extent of contamination and the degree to which it is cleaned up.

NCP (National Contingency Plan): The regulations that provide the structure and procedures for responding to discharges of oil and hazardous substances as directed by CERCLA.

PCBs (Polychlorinated Biphenyls): A group of related compounds typically used in transformers that are suspect carcinogens.

PRG (Preliminary Remediation Goal): The target contaminant concentration resulting from remediation activities.

Primary balancing criteria: One of three criteria groups used to select a remediation remedy. The five primary balancing criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

Proposed Plan: A document prepared to inform the public about alternatives that were considered for cleaning up a contaminated site and which alternative has been identified as the preferred alternative. The document encourages public comment on all alternatives.

RCRA (Resource Conservation and Recovery Act): The federal law governing the generation, transporting, and disposal of hazardous waste materials. It is administered by the USEPA.

Remedial Action: Actions taken to eliminate, reduce, or control the hazards posed by a site.

RI/FS (Remedial Investigation/Feasibility Study): Two interrelated CERCLA studies. The RI is conducted to identify the types, amounts, and locations of contamination at a facility. It also evaluates possible risk to the public and environment from exposure to contamination. The FS identifies, screens, and evaluates different alternatives for cleaning up contamination.

ROD (Record of Decision): Documentation of the selected remedy for a site and the rationale for its selection.

SARA: TheSuperfund Ammendments and Reauthorization Act that amended CERCLA and established the Community Right to Know program. :

Seeps: Water flowing from the ground surface down a slope.

Superfund: The federal hazardous waste cleanup program administered by the USEPA. Its formal title is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Threshold criteria: One of three criteria groups used to select a remediation remedy. Overall protection of human health and the environment, and compliance with ARARs (unless a specific ARAR is waived) are threshold requirements that each alternative must meet in order to be eligible for selection.

Water Table: The surface in an unconfined aquifer at which the pore water pressure is atmospheric. It reflects the groundwater level measured in shallow monitoring wells.

Wetland: An area that supports vegetation tolerant of saturated soils, has hydric soils, or is hydraulically connected to a surface water body.