Human Health and Ecological Risk Assessment
Northeast Cape, St. Lawrence Island, Alaska

Appendices A through I

Final

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APPENDIX A

Description of the Subarctic Coastal Plains Ecoregion, Northeast Cape, St. Lawrence Island, Alaska

109. Subarctic Coastal Plains

- Distinctive Features
- Climate
- Terrain
- Soils
- Vegetation
- Wildfire
- Land Use and Settlement
- Delineation Methods
- References
- A Representative Photo

Distinctive Features

The 91,000 km2 ecoregion mainly includes coastal plains of the Kotzebue Sound area and the Yukon and Kuskokwim River delta area. Flat, lake-dotted coastal plains and river deltas are characteristic of the region (fig. 19). Streams have very wide and serpentine meanders. Soils are wet and the permafrost table is shallow, providing conditions for wet graminoid herbaceous communities, the predominant vegetation type. The region is affected by both maritime and continental climatic influences.

Climate

Climate is transitional between maritime and continental influences. In general, the southern portion of the region has warmer temperatures and receives more precipitation than the northern portion. Average annual precipitation varies from around 250 mm, around Kotzebue Sound, to 500 mm, in the Yukon-Kuskokwim lowlands. Annual snowfall is approximately 100 cm in the north, and ranges from 105 cm to 150 cm in south. Temperatures in winter range from average daily lows of -25øC in the north and -20øC to - 15øC in the south, to average daily maximums of -16øC in the north and -10øC in the south. July and August are usually frost free months over most of the region. Average daily minimum temperatures in summer range from 6øC in the north, to a couple of degrees warmer in the south. Average summer daily maximum temperatures vary from 13øC to 17øC in both the northern and southern sections of the ecoregion, generally increasing inland from the coast.

Terrain

The ecoregion is comprised mainly of flat, poorly drained coastal plains with shallow permafrost tables. Low hills of basalt surmounted by cinder cones and broad shallow volcanic craters occur in some locations, creating a range in regional elevation from sea level to greater than 120 m. Slope gradients in the plains are generally less than 1ø. The region is predominantly covered by older coastal deposits of interstratified alluvial and marine sediments. Quaternary mafic and undifferentiated volcanic rocks occur in the western portion of the Yukon-Kuskokwim lowlands and on Nunivak and St. Lawrence Islands. Cretaceous intermediate volcanic rocks occur in the Selawik Wildlife Refuge Area. Only the northernmost portion of the ecoregion, around

Kotzebue, was subject to Pleistocene glaciation. Continuous thin to moderately thick permafrost currently underlies the entire region. Thaw lakes and thaw sinks are numerous. Pingos are common around the Selawik River area. Streams are sluggish and have very wide meanders.

Soils

Dominant soils are Histic Pergelic Cryaquepts and Pergelic Cryofibrists. Soils are shallow over permafrost and are constantly wet. Soils have formed from stratified silty and sandy alluvial deposits that, in many areas, have additionally incorporated deposits of volcanic ash and loess. Soils on Nunivak Island formed in very gravelly and stony materials derived from basaltic rock.

Vegetation

Standing water is almost always present in this ecoregion. Wet graminoid herbaceous communities, such as wet meadows and bogs, predominate in saturated soils. Peat mounds, barren sand dunes, and volcanic soils support dwarf scrub communities dominated by ericaceous species. In areas where peat or alluvium accumulation and growing season temperatures are sufficient, as in the southern section of the ecoregion, invasion by trees is possible and stands of needleleaf forests occur (fig. 20).

Wet meadows are typically dominated by sedges such as *Eriophorum angustifolium* and *Carex spp.* Mosses such as *Sphagnum spp.* are common and may codominate with sedges.

Bogs develop where peat mounds and polygonal ridges provide drained substrates for woody plants, such as ericaceous shrubs, including *Empetrum nigrum, Ledum decumbens, Loiseleuria procumbens, Vaccinium vitis-idaea,* and *Andromeda polifolia*). Sedges are common or codominant with woody species. Sphagnum species usually dominate the moss layer.

Dwarf scrub communities are typically dominated by crowberry (*Empetrum nigrum*). A number of other ericaceous species, including *Vaccinium vitis-idaea, V. uliginosum, Ledum decumbens, Loiseleuria procumbens*, and *Arctostaphylos alpina* and dwarf willows are common in these communities. Fruticose lichens such as *Alectoria spp., Cladina spp.*, and *Cetraria spp.* often codominate with shrubs. Mosses such as *Rhacomitrium spp., Hypnum spp., Polytrichum spp., Sphagnum spp.*, and *Dicranum spp.* are also common.

Needleleaf forests consist of black spruce (Picea mariana) and white spruce (P. glauca). Alder (Alnus spp.), willow (Salix spp.), birch (Betula glandulosa and B. nana), and ericaceous shrubs (Vaccinium vitis-idaea, Ledum decumbens, and Empetrum nigrum) may be found in the understory. Mosses such as *Sphagnum spp., Dicranum spp., Hypnum spp., Polytrichum spp., Hylocomium splendens,* and *Pleurozium schreberi* cover the ground.

Wildfire

Occurrence of wildfires in the Subarctic Coastal Plains Ecoregion is low. Fires generally range in size from less than 1 ha to 4,050 ha. Mean burn size is 280 ha.

Land Use and Settlement

Small permanent and seasonal settlements occur throughout the region, primarily adjacent to rivers or along the coast. The eastern end of Kotzebue Sound was settled by the Kotzebue Sound Inuit, who rely on small ocean mammals such as seals, land mammals such as caribou, fish such as salmon, and migratory birds and their eggs as important sources of food and materials. The western end of Kotzebue Sound and the northeastern portion of Norton Sound was settled by the Bering Strait Inuit, who depend more heavily on large marine mammals such as beluga whale, bowhead whale, and walrus. The remainder of the ecoregion was settled by the Yup'ik. The Yup'ik of St. Lawrence Island rely on walrus as a main source of food and materials. Bowhead whales and seals are also important. The Yukon-Kuskokwim Delta Yup'ik depend primarily on salmon, but other fish, seals, beluga whales, and terrestrial mammals are also important. Migratory waterfowl and their eggs provide resources during the spring. Edible and medicinal greens and berries are collected during summer.

Though mining is not extensive in this region, gold and silver have been extracted.

Delineation Methods

The ecoregion boundary represents the coincidence of low and very low terrain roughness and the "Wet Tundra" and "Moist Tundra" ecosystems portrayed on the map of "Major Ecosystems of Alaska." In the Yukon-Kuskokwim portion, areas that are north of the Yukon River include both "Wet Tundra" and "Moist Tundra" and exclude the forests of the interior regions. South of the Yukon River, only "Wet Tundra" is included because the "Moist Tundra" grades into the adjacent Ahklun and Kilbuck Mountains Ecoregion. Transition zones eliminate "Moist Tundra" from the periphery of the Subarctic Coastal Plains Ecoregion.

References

The information provided in this regional description has been compiled from: Beikman, 1980; Coulter and others, 1962; Ferrians, 1965; Gabriel and Tande, 1983; Joint Federal-State Land Use Planning Commission for Alaska, 1973; Karlstrom and others, 1964; Langdon, 1993; Larson and Bliss, written commun., 1992; Moore, written commun., 1993, Morgan, 1979; Ping, written commun., 1993; Reiger and others, 1979; Selkregg, 1974; U.S. Geological Survey, 1964; U.S. Geological Survey/EROS Data Center, Alaska Field Office, 1993; Viereck and Little, 1972; Viereck and others, 1992; Wahrhaftig, 1965; WeatherDisc Associates, Inc., 1990; and Wibbenmeyer and others, 1982.

Source: USGS, 1997

110. Seward Peninsula

- Distinctive Features
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- A representative photo

Distinctive Features

Some of the oldest geologic formations in Alaska provide a backdrop for the 47,000 km2, predominantly treeless Seward Peninsula Ecoregion (fig. 21). Mesic graminoid herbaceous communities and low scrub communities occupy extensive areas. The ecoregion is surrounded on three sides by water, yet this has little ameliorating effect on the climate. Winters tend to be long and harsh and summers short and cool.

Climate

Long, severe winters are typical of this ecoregion. Overall climatic characteristics range from maritime (a narrow strip along the coast), to transitional between maritime and continental influences (most of the region), to continental (in the eastern portion). Winds are persistent and strong throughout the region. Approximately ten weeks are frost-free each summer. All weather stations in the region are located at the lower elevations. Annual precipitation is heaviest in late summer and early fall, occurring as rain. Mean annual precipitation ranges from 250 mm to 510 mm at lower elevations, with 100 cm to 190 cm of snowfall occurring. Mean annual precipitation for the highlands, interpolated from lowland data, exceeds 1,000 mm, and snowfall may be as much as 250 cm. Average daily minimum temperature in winter ranges from -24øC to -19øC, and average daily maximum from -16øC to -11øC. Average daily minimum temperature in summer ranges from 1øC to 6øC, and maximum from 13øC to 17øC. Temperatures are generally warmer in the southern portions of the region.

Terrain

The ecoregion has narrow strips of coastal lowlands that grade into extensive uplands of broad convex hills and flat divides. Small, isolated groups of rugged mountains occur in a few locations. Elevation ranges from sea level to 500 m for most of the region; the higher mountains climb to 1,400 m. Slope gradients are generally from 0ø to 5ø in the lowlands and hills, but typically from 5ø to 15ø in the mountains. Geologic parent materials include Paleozoic sediments and metamorphosed volcanic rocks, and Precambrian volcanic rocks. Highland areas are possible Cenezoic uplifts of these formations. An extensive area of Quaternary or Tertiary volcanic rock occurs in the northeastern portion of the ecoregion.

Permafrost is continuous throughout the ecoregion, ranging from a thin to moderately thick layer. Related features, such as gelifluction lobes (fig. 22) and stone stripes on sloping areas, frost scars on low knolls, and polygons in level valley bottoms, are common. Streams draining interior basins travel through narrow canyons across broad uplands. Lowlands have numerous thaw lakes, but lakes are rare in the highlands. Except for the highest elevations, the region was unglaciated during the Pleistocene epoch.

Soils

Predominant soils are Histic Pergelic Cryaquepts, Pergelic Cryaquepts, Typic Cryochrepts, Pergelic Cryumbrepts, Lithic Cryorthents, and Pergelic Cryorthents. Soils are generally poorly drained and shallow over permafrost. Soils on hillslopes and ridges formed in very gravelly residual materials over weathered bedrock. Soils in valleys and on lower slopes formed mainly in colluvial and alluvial sediments.

Vegetation

The coastal beaches, rolling hills, and mountains in this ecoregion provide a variety of climate and substrate characteristics. Mesic graminoid herbaceous communities (fig. 23) and low scrub communities occupy extensive areas on hills and lower mountain slopes. Saturated or flooded soils sustain wet graminoid herbaceous communities. Tall scrub vegetation occurs along streams and on floodplains. Ridgetops and higher elevations are barren or support dwarf scrub communities.

Mesic graminoid herbaceous communities are dominated by tussock-forming sedges. Low scrub communities result when woody species colonize the area between tussocks. Principal sedges are Eriophorum vaginatum and Carex bigelowii. Woody species include dwarf arctic birch (*Betula nana*), resin birch (*B. glandulosa*), mountain-cranberry (*Vaccinium vitis-idaea*), bog blueberry (*V. uliginosum*), diamondleaf willow (*Salix planifolia*), netleaf willow (*S. reticulata*), and crowberry (*Empetrum nigrum*). Mosses such as *Pleurozium schreberi, Hylocomium splendens, Aulacomnium spp.*, and *Sphagnum spp.* are prevalent and lichens such as *Cetraria cucullata, C. islandica, Cladonia spp., Cladina rangiferina*, and *Thamnolia subuliformis* can be common.

Wet graminoid herbaceous communities consist of sedges such as *Carex aquatilis, C. lyngbyaei, C. rostrata, C. saxatilis, C. sitchensis*, and *Eriophorum angustifolium* and grasses including *Calamagrostis canadensis* and *Arctophila fulva.*

Tall scrub communities are dominated by willow species including *Salix alaxensis, S. glauca, S. planifolia*, and *S. lanata*). Birch (*Betula nana*) may codominate with willow in some areas. Other woody constituents include alder (*Alnus sinuata* and *A. crispa*) and shrubby cinquefoil (*Potentilla fruticosa*). A dense herb layer may be present, typically including oxytrope (*Oxytropis spp.*), vetch (*Astragalus spp.*), dwarf fireweed (*Epilobium latifolium*), wormwood (*Artemisia spp.*), and bluejoint (*Calamagrostis canadensis*). Mosses such as *Polytrichum spp., Hylocomium splendens*, and *Drepanocladus uncinatus* can be abundant.

Dwarf scrub communities are composed of low shrubs, grasses, and lichens. Communities are dominated by mountain-avens (*Dryas octopetala* and *D. integrifolia*), or codominated by a combination of mountain-avens and sedges including *Carex scirpoidea*, *C. misandra*, and C. *bigelowii* or mountain-avens and lichens including *Alectoria spp.*, *Cetraria spp.*, and *Cladina spp.*. Other typical shrubs occurring in these communities are willows (*Salix reticulata* and *S. phlebophylla*) and ericads such as *Cassiope tetragona*, *Empetrum nigrum*, *Arctostaphylos spp.*, *Vaccinium vitis-idaea*, and *V. uliginosum*. Mosses including *Tomenthypnum nitens*, *Rhytidium rugosum*, and *Hylocomium splendens* can be common.

Wildfire

Occurrence of wildfires in the Seward Peninsula Ecoregion is common. Burns range in size from less than 1 ha to 109,260 ha, with an average size of 2,815 ha. Mosses and lichens dry out during summer, allowing fire to spread readily through the tundra. Fire season is usually from June through August.

Land Use and Settlement

Population is low and small settlements are scattered throughout the region. The land has been historically used for subsistence hunting and fishing by the Bering Strait Inuit. Their livelihood has depended on large marine mammals, such as bowhead whales, beluga whales, and walrus. Winter ice fishing and seal hunting are important to supplement spring and summer ocean catches. Away from the coast, streams provide sources of salmon and freshwater fish. Large game such as caribou and smaller mammals including rabbits, squirrels, muskrats, and beaver are also taken. Reindeer herding is unique to this area.

A number of metallic elements, including antimony, barium, gold, lead, silver, tin, tungsten, and zinc occur in the region. Numerous mines are scattered throughout large portions of the region, including many gold mining operations. Other important metals include: copper, mercury, platinum, and uranium. Antimony, bismuth, and coal have also been mined.

Delineation Methods

The ecoregion boundary delineates a break between the forested ecosystems of interior Alaska, and the non-forested peninsula. One of the characteristic features of the Seward Peninsula is the age of the bedrock geologic formations; the transitional area on the ecoregion map excludes the more recent geologic formations along the eastern portion of the ecoregion from the older formations throughout the core of the region.

References

The information provided in this regional description has been compiled from: Beikman, 1980; Coulter and others, 1962; Ferrians, 1965; Gabriel and Tande, 1983; Joint Federal-State Land Use Planning Commission for Alaska, 1973; Karlstrom and others, 1964; Langdon, 1993; Larson and Bliss, written commun., 1992; Moore, written commun., 1993; Morgan, 1979; Ping, written

commun., 1993; Reiger and others, 1979; Selkregg, 1974; U.S. Geological Survey, 1964; Viereck and Little, 1972; Viereck and others, 1992; Wahrhaftig, 1965; and WeatherDisc Associates, Inc., 1990.

Source: USGS, 1997

APPENDIX B

USACE Trip Report – Biological Sampling

REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 898
ANCHORAGE, ALASKA 99506-0898

CEPOA-EN-CW-ER (1105-2-10b)

MEMORANDUM FOR RECORD: Final Draft printed, 6 September 2001.

SUBJECT: Northeast Cape, Saint Lawrence Island fish data collection report, August 18 through August 22, 2001.

Introduction
A formally used defense site (FUDS) is located near the Northeast Cape of Saint Lawrence Island, Alaska. The site was abandoned in 1972 and a clean up of the facility is currently underway. Fuel spills were known to exist during the facility's operation and contamination from the spills and other sources may have contaminated fish resources in the Suqitughneq River drainage that originates at the site. The purpose of this field effort was to collect fish samples for human-risk analysis in accordance with the biological sampling plan (BSP). Anadromous Dolly Varden (*Salvelinus malma*), pink salmon (*Onchorhynchus gorbuscha*) and Alaska blackfish (*Dallia pectoralis*) were the target species.

Survey Location
Locations of capture attempts were the Suqitughneq River, Tapisaghak River and the outlet of the Seepanpak Lagoon, Northeast Cape, Saint Lawrence Island, Alaska. The latitude and longitude of each data collection point is listed.

Schedule
The data collection took place between 17 August and 22 August, 2001.

Methods
Dolly Varden and Alaska blackfish were captured in baited hoop nets and minnow traps, and with gillnets. The traps were baited with salmon eggs preserved with a mixture of laundry borax, non-iodized table salt, sugar, and strawberry flavored jello. The salmon eggs used to bait the hoop nets were placed in a container designed to release scent and the fish captured in the hoop nets were not directly exposed to the bait. The blackfish captured in the minnow traps were directly exposed to the bait and could have ingested it while in the traps. Traps were soaked for approximately 24 hours.

Capture with sport gear was attempted, but no fish were caught with sport tackle.

Results and Discussion
Dolly Varden and Alaska blackfish were caught as in the below table (Table 1). Only the fish listed in table 2 were retained. All others were released.

Table 1. Target species caught during the survey.

Date	Location	Trap #	N Lat.	W Lon.	Gear	Dolly Varden		Blackfish		Pink Salmon
						Num	mm	Num	mm	Num
18 Aug 01	Suqi River	1	63 18 45.0	168 56 38.2	HN	23	118-208	0		
	Suqi River	2	63 18 50.6	168 56 59.9	HN	2	146-207	0		
	Suqi River	3	63 18 52.9	168 56 59.9	HN	1	232	0		
	Suqi River	4	63 19 21.0	168 58 26.8	HN	0		0		
	Suqi Lagoon	5	63 19 36.4	168 57 54.4	HN	0		0		
	Suqi Lagoon	6	63 20 03.6	168 56 45.6	HN	0		0		
	Suqi Ditch	1	63 18 40.5	168 57 42.0	MT	0		0		
	Suqi Ditch	2	63 18 41.4	168 57 46.0	MT	0		0		
	Suqi Ditch	3	63 18 42.6	168 57 50.2	MT			0		
	Suqi Ditch	4	63 18 49.1	168 57 46.6	MT			3	125-137	
	Suqi Ditch	5	63 18 50.4	168 57 45.6	MT			6	117-210	
	Suqi Ditch	6	63 18 50.9	168 57 45.9	MT	0		3	118-134	
19 Aug 01	Suqi River	1-A	63 18 46.1	168 56 41.6	HN	15	82-174	1	62	
	Suqi River	2-A	63 18 50.3	168 57 02.4	HN	28	98-285	0		
	Suqi River	3-A	63 18 52.9	168 57 32.5	HN	0		0		
	Suqi Lagoon	5-A	63 19 36.4	168 57 54.4	HN	1	153	0		
	Suqi Lagoon	6-A	63 20 03.6	168 56 45.6	HN	0		0		
	Suqi Lagoon	7	63 20 01.4	168 56 50.2	HN	0		0		
	Suqi Ditch	1-a	63 18 42.6	168 57 50.2	MT	0		0		
	Suqi Ditch	2-a	63 18 42.6	168 57 50.2	MT	0		0		
	Suqi Ditch	3-a	63 18 49.1	168 57 46.6	MT	0		0		
	Suqi Ditch	4_a	63 18 49.1	168 57 46.6	MT	0		2	110-125	
	Suqi Ditch	5-a	63 18 50.4	168 57 45.6	MT	0		11	107-152	
	Suqi Ditch	6-a	63 18 50.9	168 57 45.9	MT	0				
20 Aug 01	Suqi River	1-B	63 18 45.0	168 56 38.2	HN	51	82-218	0		
	Suqi River	2-B	63 18 50.3	168 57 02.4	HN	21	87-222	0		
	Suqi River	3-B	63 18 53.3	168 57 25.8	HN	4	190-306	0		

	Tap River	4-B	63 18 57.7	168 50 51.7	HN	0		0		
	Tap River	5_b	63 18 57.7	168 50 51.7	HN	0		0		
	Tap River	6-B	63 18 52.0	168 51 174.9	HN	0		0		
	Suqi Ditch	1-b	63 18 53.4	168 57 44.1	MT	3	137-155	16	82-150	
	Suqi Ditch	2-b	63 18 53.4	168 57 44.1	MT					
	Suqi Ditch	3-b	63 18 53.4	168 57 44.1	MT					
	Suqi Ditch	4-b	63 18 53.4	168 57 44.1	MT					
	Suqi Ditch	5-b	63 18 53.4	168 57 44.1	MT					
	Suqi Ditch	6-b	63 18 53.4	168 57 44.1	MT					
	Suqi Lagoon	1	63 19 35.7	168 57 51.4	GN	3	455-480			
	Tap Lagoon	1	63 18 59.5	168 50 49.0	GN	0		0		4
21 Aug 01	Suqi River	3-C	63 18 53.3	168 57 25.8	HN	0		0		
	Suqi River	8-C	63 18 52.4	168 57 21.5	HN	2	124-213	2	132-148	
	Suqi Lagoon	1	63 19 35.7	168 57 51.4	GN	8	415-477	0		
	Tap Lagoon	1	63 18 59.5	168 50 49.0	GN	4	420-464	0		3
	Seep Lagoon	1	63 20 42.7	169 16 12.1	GN	0		0		1
22 Aug 01	Suqi Lagoon	1	63 19 35.7	168 57 51.4	GN	8	420-520	0		0

Suqi = Refers to locations within the Suqitughneq River drainage.
Tap Lagoon = Tapisaghak River Lagoon.
Seep Lagoon = Seepanpak Lagoon

Table 2. Fish from Table 1 that were retained for analysis (all others in Table 1 were released).

Date	Location	Dolly Varden		Blackfish		Pink Salmon	
		Length [a]	Wt. (g)	Length [a]	Wt. (g)[b]	Length [a]	Wt. (g)
18 Aug	Suqi River			125			
	Suqi River			137			
	Suqi River			210			
	Suqi River			135			
	Suqi River			138			
	Suqi River			139	415		
	Suqi River			122			
	Suqi River			117			
	Suqi River			134			
	Suqi River			128			
	Suqi River			118			
19 Aug	Suqi River	285	200	125			
	Suqi River	254	170	110			
	Suqi River	208	80	138			
	Suqi River	240	125	140			
	Suqi River	218	100	122			
	Suqi River	215	90	131			
	Suqi River			125	280		
	Suqi River			152			
	Suqi River			110			
	Suqi River			125			
	Suqi River			45			
	Suqi River			107			
	Suqi River			145			
20 Aug	Suqi River	306	300	128		470	980
	Suqi River	455	800	12		445	880
	Suqi River	470	1100	119		463	1140
	Suqi River	480	1090	124			
	Suqi River			128			
	Suqi River			110			
	Suqi River			117			
	Suqi River			133			
	Suqi River			129	660		
	Suqi River			102			
	Suqi River			142			
	Suqi River			118			
	Suqi River			140			
	Suqi River			128			
	Suqi River			122			
	Suqi River			120			

Continued

Table 2. Continued.

Date	Location	Dolly Varden		Blackfish		Pink Salmon	
		Length	Wt. (g)	Length	Wt. (g)	Length	Wt. (g)
	Suqi River			124			
	Suqi River			112			
	Suqi River			116			
	Suqi River			135			
	Suqi River			135			
	Suqi River			128			
	Suqi River			135			
	Suqi River			112			
	Suqi River			150			
	Suqi River			125			
	Suqi River			138			
	Suqi River			135			
	Suqi River			110			
	Suqi River			119			
	Suqi River			108			
	Suqi River			82			
21 Aug	Suqi River	455	980				
	Suqi River	505	1220				
	Suqi River	450	930				
	Suqi River	415	640				
	Suqi River	445	780				
	Suqi River	477	950				
	Suqi River	448	900				
	Suqi River	420	740				
	Tap River	465	980				
	Tap River	460	860				
	Tap River	490	1240				
22 Aug	Suqi River	450	860				
	Suqi River	440	900				
	Suqi River	420	780				
	Suqi River	480	1090				
	Suqi River	520	1320				
	Suqi River	445	830				
	Suqi River	430	680				
	Suqi River	480	1170				

a. Length is from tip of snout to fork of tail in millimeters for comparison between species (a statistical, mid-eye-to-fork-of-tail measurement was also taken, but not reported).

b. Composite live weight.

Table 3. Summary of sample goals. Anadromous Dolly Varden of subsistence harvest size was preferred for analysis. Resident fish were retained for possible contaminant comparison.

Drainage	Dolly Varden		Blackfish		Pink Salmon	
	Goal	Retained	Goal	Retained	Goal	Retained
Suqi River	10	10	300 grams[a]	1,355 grams[a]	2	0
Tap River	6	3	0	0	2	3
Additional Suqi River Samples	9	9	0	0	0	0
Suqi River Resident Fish Samples	0	8	N/A	N/A	N/A	N/A
Total	25	30	300	1,355	4	3

a Live weight.

The BSP called for sample weights of heads, filets, and roe of 100 grams from anadromous Dolly Varden of a size (approximately 7 + inches) that might typically be retained for human consumption. Recommended sample sizes and weights of Dolly Varden and Alaska blackfish from the Suqitughneq River were met, but the background sample size from the Tapisaghak River was short by three fish.

There is no known discharge data available from the Tapisaghak River, but during this survey it was approximately 30 feet wide and one foot deep when it is contained in one channel. The river appeared to be at normal stage and the water was exceptionally clear. The mouths of all lagoons at Northeast Cape, except perhaps the Seepanpak Lagoon, appear to berm with surf-deposited, sand and gravel during periods of brisk northerly winds. The Seepanpak Lagoon is reported to berm over, but it was open during our visits. The Tapisaghak River and Suqitughneq River lagoons were bermed during the survey, and it was not possible for fresh fish to enter the lagoons from the Bering Sea. Prior to the breaching of the Tapisaghak River berm, only one pink salmon was seen in the lagoon during several visits when we attempted to capture fish with hoop nets and sport tackle. We caught late-run pink salmon and Dolly Varden in the lower lagoon with a gillnet after the berm was breached and fresh fish entered the lagoon, but because of time and weather, only one gillnet set was possible after the berm was breached.

The Tapisaghak River (3.8 miles east of the Suqitughneq River) appears to support a reasonable sized run of pink salmon judged by the few hundred pink salmon estimated spawning up to about 3 miles upstream from the lagoon. The river is braided in places and shows definite signs of scouring, but it is probable that during an even-numbered year, even more pink salmon would spawn in this stream. Pink salmon are of questionable value for this study because of their short resident time in freshwater as fry, but three adult pink salmon were retained as possible background samples. Three sockeye salmon were also seen a few miles upstream in the Tapisaghak River, but they were considered strays to the drainage.

The Suqitughneq River normally lacks the discharge to breach the berm during northerly winds, and probably has never been able to support viable spawning runs of pink salmon because of it. Unlike in the Tapisaghak River where anadromous Dolly Varden that entered prior to berming

had already moved upstream, anadromous Dolly Varden in the Suqitughneq River lagoon had not moved upstream and they were susceptible to the gillnet set in the lagoon.

The Suqitughneq River also supports a stock of resident Dolly Varden that do not appear to migrate to sea. These fish were noted to be sexually mature starting at about 6 inches in length. Resident fish might be expected to have higher contaminant levels present than the anadromous fish because of their continuous residence in the affected drainage. Resident fish from the Suqitughneq River were retained because: 1) we were not catching any anadromous fish during the first few field days and could not guarantee filling the sample goal with anadromous fish, and 2) they spend their lives in the Suqitughneq River, and could possibly be used to help fingerprint any specific Suqitughneq River contaminants that might be found in the anadromous fish.

The mouth of the Seepanpak Lagoon, 9.4 miles west of the Suqitughneq River mouth, was visited on several occasions in an attempt to collect background samples of anadromous Dolly Varden in the event collection attempts at the Tapisaghak River failed. We were informed by the local Natives that, similar to the other streams in the area, the run of anadromous Dolly Varden in the Seepanpak Lagoon drainages was several weeks past peak, but that we may get lucky and catch some late fish. Several angler hours of fishing with sport tackle and one 24 hour set of a 60 foot gillnet produced two strikes from Dolly Varden on sport tackle and the capture of one pink salmon and a large warty sculpin (*Myoxocephalus verrucosus*) in the gill net. According to the local Natives, late July through the first week of August is the best times to catch anadromous salmon and Dolly Varden as they enter the lagoons in this area of Saint Lawrence Island. We appeared to be about two weeks behind the run for this effort, and only low numbers of late-run fish appeared to be entering the rivers once the berms were breached.

A small lake at the head of the Suqitughneq River was visited several times during the survey. This lake appears to be very shallow (no more than about 5 feet deep) with a mud bottom. Although there are reports of fish in the lake, we saw none except the small resident Dolly Varden near the outlet. A flock of several dabbler ducks, possibly pintails, were observed tipping to feed in the center of the lake testifying to its shallowness. Additionally, the water is very clear and the substrate appears to have a uniform, gray appearance with no darker appearing holes when viewed from a higher vantage point. Unless large springs are present, this lake would most likely freeze to the bottom during winter and result in a winterkill of most fish. It is speculated that resident, and perhaps anadromous, Dolly Varden in the Suqitughneq River drainage overwinter in deeper holes and under the abundant cutbanks, or in the lagoon. Alaska blackfish are exceptionally hardy and can overwinter in muddy areas of the drainage with low oxygen concentrations.

A late run of chum salmon reportedly entered the Tapisaghak River and anadromous Dolly Varden were seen upstream in the Suqitughneq River after the COE biologists departed the area on 23 August 2001 (F. Kingeekuk Jr., personal communication to W. O'Connell). The extent of these reported sightings is unknown.

Site Photos

Photo 1. Recovery of a hoop net trap from the Suqitughneq River at Northeast Cape, Saint Lawrence Island, Alaska on 20 August 2001.

Photo 2. Catch of resident and possibly pre-smolt Dolly Varden from the Suqitughneq River at Northeast Cape, Saint Lawrence Island, Alaska on 20 August 2001 with a baited hoop net trap.

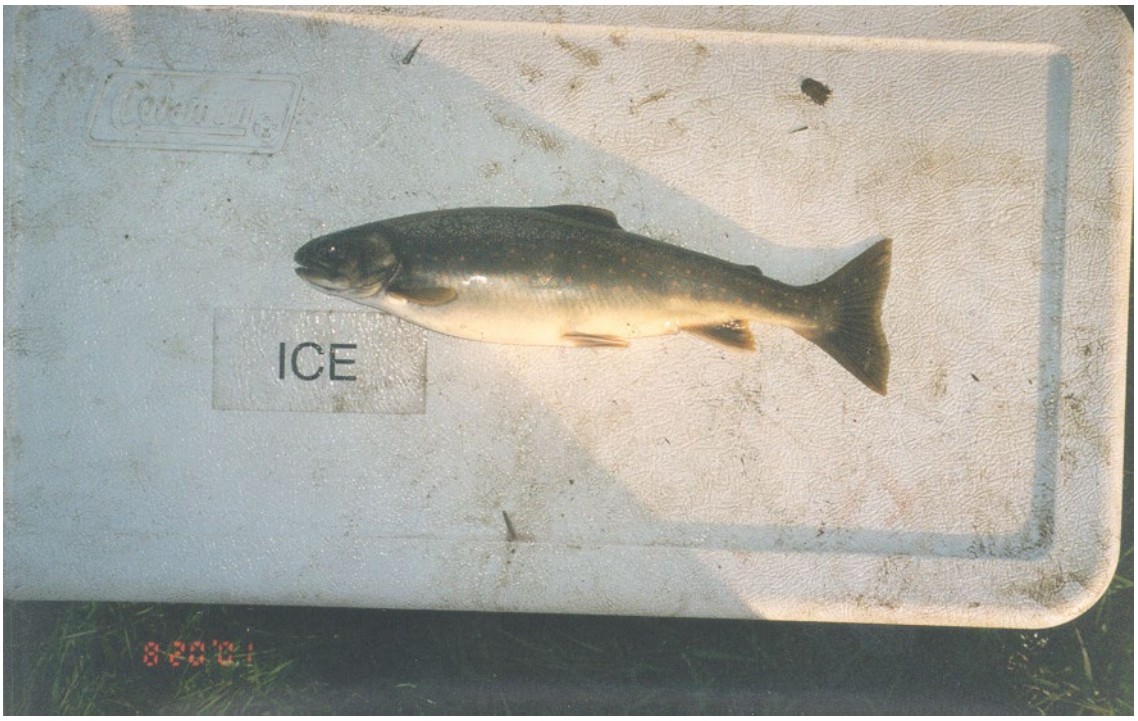

Photo 3. Example of a resident female Dolly Varden (306 mm) in spawning condition from the Suqitughneq River at Northeast Cape, Saint Lawrence Island, Alaska during late August 2001.


Photo 4. Typical Alaska blackfish habitat in the Suqitughneq River drainage ditch at Northeast Cape, Saint Lawrence Island, Alaska during late August 2001.

Photo 5. Recovery of a Dolly Varden from a gillnet in the Suqitughneq River lagoon at Northeast Cape, Saint Lawrence Island, Alaska on 20 August 2001.

Photo 6. Catch of anadromous Dolly Varden from the Suqitughneq River lagoon at Northeast Cape, Saint Lawrence Island, Alaska on 21 August 2001.

Photo 7. Corps of Engineers biologists weighing Dolly Varden caught in the Suqitughneq River lagoon at Northeast Cape, Saint Lawrence Island, Alaska on 21 August 2001.

Photo 8. Berm of sand isolating the Suqitughneq River lagoon at Northeast Cape, Saint Lawrence Island, Alaska from the Bering Sea. This berm is typically present during periods of northerly, onshore winds and prevents the migration of anadromous fish into the lagoon.

Personnel

The following persons conducted this sampling effort in the field.

Larry Bartlett, Corps of Engineers. Lead biologist.
Chris Hoffman, Corps of Engineers. Assisting biologist.
William O'Connell, Montgomery-Watson-Harza. Fish sample recipient and shipping preparation.
Floyd Kingeekuk Jr. Polar bear watch and local guide.

This Trip Report was written by:

Larry D. Bartlett
General Biologist
En-Cw-Er

And review by:

Chris Hoffman
General Biologist
En-Cw-Er

This trip report is electronically filed in:

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APPENDIX C

Community Surveys

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

SUMMARY OF PRELIMINARY SURVEY RESULTS

5 Surveys returned
3 Male (ages 37,35,45), 1 Female (age 43), 1 married couple (no age given)

FISH FROM SUQITUGHNEQ RIVER

The Suqi River currently supports a relatively small population of fish, compared to the Tapisaghak, Seepenpak, or other rivers on St. Lawrence Island.

What kinds of fish do you currently catch from the Suqi River? _____

Male	Female	Married Couple
None (3)	None	Dolly's

How many fish do you currently catch from the Suqi River?_____

Male	Female	Married Couple
None (3)	None	0

What kinds of fish do you catch from other rivers? _____
(including the Tapisaghak, Seepenpak, and others)

Male	Female	Married Couple
Dolly's (3), Silvers (3), Trout (1), Tom Cod (1), Humpies (2)	Dolly's, Tom Cod, Silvers	Dolly's, Humpies, Silvers, White

How many fish do you currently catch from other rivers? _____

Male	Female	Married Couple
About 200 (1), About 100 (2)	About 200	100+

How many people in your family eat the fish that you catch?_____

Male	Female	Married Couple
Whole family (3)	Whole family except 1	Whole family

Do you share the fish you caught with relatives? _____

Male	Female	Married Couple
Yes (3)	Yes	Yes

Before the 1960's, how many fish did you (or your family) catch from the Suqi River?
____ More than today How much more? _____
____ Less than today
____ About the same

Male	Female	Married Couple
Don't know (wasn't born) (2) More than today (1). Don't	More than today. Don't know how much more.	More than today. A lot more, don't fish anymore

know how much more.		

What kinds of fish were caught from the Suqi River before the 1960's? _____

Male	Female	Married Couple
Don't know (2), Dolly's (1)	Doesn't remember	Dolly's

In the future, could the Suqi River support a significantly larger Dolly Varden population?
___ Yes ___ No ___ Don't know/maybe

Male	Female	Married Couple
No (1), Don't know/maybe (2)	No	Yes

In the future, could the Suqi support as many Dolly Varden as the Tapisaghak or Seepenpak rivers?
___ Yes ___ No ___ Hard to Predict Why?_____

Male	Female	Married Couple
No (1), Hard to Predict (2)	Hard to predict	Hard to Predict

Do you harvest fish from the Suqitughneq River?
___ Yes ___ No

Male	Female	Married Couple
No (3)	No	No

What proportion of the total fish you catch on the island comes from the Suqitughneq River only?
___ Less than 25% (specify:_____)
___ Equal to 25%
___ Greater than 25% (specify: _____)

Male	Female	Married Couple
Less than 25% (3). (0%)	Less than 25%	Less than 25% (0%)

What proportion of the fish you catch on the island comes from rivers other than the Suqitughneq?
___ Less than 75% (specify:_____) (for ex: Tapisaghak, Seepenpak, others...)
___ Equal to 75%
___ Greater than 75% (specify: _____)

Male	Female	Married Couple
Greater than 75% (3) (100%)	Greater than 75%	Greater than 75% (100%)

Consumption of fish
Fish are typically prepared as fried or boiled, with the skin on. Fillets represent the main food item.
____ I agree ____ I disagree

Male	Female	Married Couple
Agree (3)	Agree	Agree

I also prepare fish as follows: _____

Male	Female	Married Couple
Dry (2), Bake (2), Fried (1)	Bake, half dried, frozen, etc.	--

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

I eat fresh fish fillets during the summer months (mid-June to mid-September):

____ More than 3 times per week (Please specify how many times per week _____)
____ About 3 times per week
____ Less than 3 times per week (Please specify how many times per week _____)

Male	Female	Married Couple
More than 3x per week (6 times) (1) Less than 3x per week (1 time) (1) About 3 times per week	About 3X per week	Less than 3X per week (1X per week)

How many fish fillets do you consume in a month? _____

Male	Female	Married Couple
24 (1) About 3 (2)	About 12	6

Do you eat fresh fillets at other times of the year? _____

Male	Female	Married Couple
Yes (3)	Yes	Yes

Fish heads are also eaten in late summer, approximately 2 meals per month.
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (2) Disagree (1) – More than 2 meals per month	Agree	Agree

I eat fish heads approximately _____ meals per month, during the following months: _____
or _____ times per year

Male	Female	Married Couple
10 meals per month (June-Sept) (1) 1 meal per month (June-Sept) (1) 2 meals per month (1)	4 meals per month during June, Sept, Oct or 20 times per year	2 meals per month

Fish eggs are also mixed with fish for eating.
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

I eat fish eggs ____ about once every month or two
____ more than once every month or two (How much more? _____)
____ less than once every month or two (How much less? _____)

Male	Female	Married Couple
About once every month or two (2) Less than once every month or two (1) – only on birthdays	More than once every month or two (about 4 to 5 times)	About once every month or two

What other fish parts are eaten?_____
(for example, fish cheeks, heads, cartilage, etc.)

Male	Female	Married Couple
Everything except the guts (1) Everything except the guts, bones (1) Head, whole fish except the cartilage (1)	Fish cheeks, heads	All the parts

I eat these fish parts approximately ____ meals per week, or ____ meals per month during the following months of the year: _____

Male	Female	Married Couple
24 meals per week, during June-Sept (1) 1 meal per week (1) 2/3 meals per month (1)	3 meals per week, during June to September	1 meal per week, 4 meals per month during June through September

Do you dry the fish you catch? _____ If so, how many fish are dried? _____

Male	Female	Married Couple
Yes (3). About 100+ (1) About ½ the catch (2)	Yes. About ½ the catch	Yes. About ½ the catch

List types of fish dried:_____

Male	Female	Married Couple
Dolly's (1) Dolly's, silvers, and trout (1)	Dolly's, Silvers, Bull fish, Tom Cod	--

When do you usually eat dried fish?
___ All year
___ Mostly in the fall/winter/spring (approximately 9 months of the year)
___ Other _____

Male	Female	Married Couple
All year (2) Mostly in the fall/winter/spring (1)	All year	All year.

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

Dried fish are eaten at a rate of 1 meal per week in the non-summer months (mid-September to mid-June).

____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

I eat dried fish approximately ____ meals per week, or ____ meals per month during the following times of the year:_____

Male	Female	Married Couple
1 meal per week (2) 3 meals per month (1)	1 meal per week whenever available	1 meal per week during September to June

Depending on the kind of fish, fish is frozen for future consumption.

____ I agree ____ I disagree

Male	Female	Married Couple
Agree (3)	Agree	Agree

What kinds of fish are frozen for future consumption? _____

Male	Female	Married Couple
Dolly's, Trout (3) Tom Cod (2)	Dolly's, Tom Cod, Silvers, etc.	Dolly's, Steelhead salmon

A portion of fish caught in the summer are frozen for eating during the remainder of the year (9 months). Frozen fish are eaten at a rate of 1 meal per week in the non-summer months.

____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

I eat frozen fish approximately ____ meals per week, or ____ meals per month during the following times of year:_____

Male	Female	Married Couple
1 meal per week (3) during Sept-June (1)	1 meal per week	1 meal per week

Do you age fish for future consumption? What kinds of fish are aged? _____

___ Yes ___ No

Male	Female	Married Couple
No (2) Yes (1). Dolly's, Trout	Yes. Dolly's, Trout	Yes. Just the heads.

I eat aged fish approximately ____ meals per week, or ____ meals per month during the following times of year:_____

Male	Female	Married Couple
1 meal per month (1) Don't eat (2)	2 or 3 times a year	Once in a great while.

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

The average sized edible Dolly Varden collected from the Suqi River in 2001 weighed 2 pounds (whole) and was 18 inches long.

How many people does **1** Dolly Varden usually feed? _____ adults, or _____ children (under age 8)

Male	Female	Married Couple
2 adults or 3 children (1) 1 adult or 2 children (1) 1 or 2 adults or 4 children (1)	2 adults or 3 children	2 adults or 3 children

How many meals (portions) would 1 typical sized Dolly Varden yield?

____ as fresh fillets
____ as dried fish
____ as aged fish
____ as frozen fish

Male	Female	Married Couple
As fresh, frozen (3) As dried (2)	As fresh fillets, dried fish, frozen fish.	As fresh fillets, dried fish, frozen fish.

An adult eats 6 ounces of fish per meal, or approximately 1/3 pound.

____ I agree ____ I disagree. I eat approximately _____ pounds of fish per meal.

Male	Female	Married Couple
Disagree (3) 1 pound of fish per meal (2) ¾ pound of fish per meal (1)	Disagree. 1 pound of fish per meal.	Agree

A child eats 2 ounces of fish per meal, or approximately 1/8 pound.

____ I agree ____ I disagree. Children eat approximately _____ pounds of fish per meal.

Male	Female	Married Couple
Disagree (3) ½ pound of fish per meal (2) ¾ pound of fish per meal (1)	Disagree. ½ pound of fish per meal	Agree

What is the history of the beach berm (physical barrier) at the Suqi River lagoon/estuary?

____ Always occurs at least once in the summer months
____ Sometimes occurs during the summer months
____ Never occurred until recently

Male	Female	Married Couple
Sometimes occurs (3)	Sometimes occurs	Sometimes occurs

Does the beach berm at the Suqi River occur more often today than in previous years?

___ Yes ___ No ___ Don't know

Male	Female	Married Couple
Don't know (3)	Don't know	Don't know

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

Historically, did the Suqi River become periodically blocked by a berm during the summer months?

___ Yes ___ No If yes, how often? _____

Male	Female	Married Couple
No (2) Don't know (1)	Yes. Not very often.	Yes. Once or twice.

When harvesting for subsistence foods at Northeast Cape, where do you stay?_____

Male	Female	Married Couple
Seepenpak (1) Alngiighyak (1) NE Cape uncle's house (1)	Tamniq	Sepenpak

Where do you get your water?_____

Male	Female	Married Couple
Seepenpak (1) Alngiighyak (1) Tapiisak (1)	A small creek by Tamniq Lake	Tapinsak

PLANTS HARVESTED AT NORTHEAST CAPE STUDY AREA
(Drainage Area North of Main Complex)

I eat native plants (greens, roots or berries) during the summer months (mid-June to mid-September):

____ More than 4 times per week (Please specify how many meals per week _____)

____ About 4 times per week

____ Less than 4 times per week (Please specify how many meals per week _____)

Male	Female	Married Couple
About 4x per week (2) Less than 4x per week (1)	About 4X per week	Less than 4X per week

Harvested native plants are frozen for eating during the winter.

____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

I also prepare native plants as follows: _____

Male	Female	Married Couple
N/A – berries (1) Don't know (2) – women usually prepare them	Aqutaq, aged, fresh, frozen	--

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

In the winter months, I eat approximately _____ meals of native plants per week,
or _____ meals of native plants per month.

Male	Female	Married Couple
1 meal per month (1) 2 meals per month (1) 1 meal per week (1)	2 meals per month	2 meals per month

3 categories of native plants are eaten: berries, greens, and roots.
____ I agree ____ I disagree

Male	Female	Married Couple
Agree (3)	Agree	Agree

An average adult eats nearly ½ pound* of native plants per meal.
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

I eat _____ pounds or ____ cups of native plants per meal. (* ½ pound equals about 1 ½ cups of berries)

Male	Female	Married Couple
½ pound (3)	½ pound	½ pound

Children eat native plants at a rate approximately 1/4th of adults.
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (3)	Agree	Agree

Children eat _____ pounds or _____ cups of native plants per meal.

Male	Female	Married Couple
¼ pound (3)	¼ pound	¼ pound

The majority of locally harvested native plants are collected from <u>outside</u> the Northeast Cape Study Area (the drainage north of the Main Complex).
25% of locally harvested native plants and berries are obtained from <u>within</u> the Northeast Cape Area.
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (1) Disagree (2) – don't know/women harvest	Agree	Agree (less than 25%)

Currently, I harvest _____% of my native plants and berries from <u>within</u> the <u>Northeast Cape Study Area</u>.

Male	Female	Married Couple
30% (1) 0% (1) Don't know (1)	10%	0%

NORTHEAST CAPE (FORMER AIR FORCE STATION) – SUBSISTENCE QUESTIONS

Currently, I harvest _____ % of my native plants and berries from areas outside Northeast Cape.

Male	Female	Married Couple
70% (1) 0 % (1) Don't know (1)	90% Comment: very poor with plants, berries	100%

If no contamination was present, I would harvest _____ % of my native plants and berries from within the Northeast Cape Study Area (the drainage north of the Main Complex).

Male	Female	Married Couple
100% (1) 0% (1) -- (1)	100%	50%

People eat succulent greens (roseroot or *nunivak*), other greens (white arctic mountain heather or *kittmik*), berries (blackberry/crowberry, or *ququnqhaq* and *aqavzik*), *saqllak* and *allqegkaq* (sourdough).
____ I agree ____ I disagree.

Male	Female	Married Couple
Agree (2) -- (1)	Agree	Agree

I also harvest and eat the following plants from within the Northeast Cape Study Area: _____

Male	Female	Married Couple
Berries.	Anylugrak	Hardly harvest.

Male ____ **Female** _____ **Age:** _____
Name (optional): _____ **Contact phone (optional):** _____

Northeast Cape Site

The U.S. Army Corps of Engineers is investigating and remediating environmental conditions at the former military installation at Northeast Cape. In addition to the ongoing building demolition and hazardous waste removal activities, the Army Corps is conducting an analysis of potential risks to human health and the environment due to exposure to contaminants remaining at the site. As part of these efforts, additional fish sampling will be conducted in the Suqitughneq River.

Your help in answering the following questions will assist the Corps with planning the field investigation, and analyzing the potential for any site-related risks.

Questions:

1. What fish species are present in the vicinity of Northeast Cape?

   a. Current _____

   b. Historically (pre-1960 spill) _____

2. During what time of year did you historically fish at Northeast Cape?

   _____

   and for how many days per year were they harvested?

   _____

3. During what time of year are fish currently harvested at Northeast Cape?

   _____

   and for how many days per year are they harvested?

   _____

4. Where specifically are the freshwater and saltwater species currently harvested? (Please mark on the attached map where the freshwater and the saltwater fish are harvested. Please use (F) for the freshwater and (S) for the saltwater.)

   _____

5. Do you harvest fish from the estuary/lagoon area at the mouth of the Suqitughneq River drainage?
   a. YES _____
   b. NO _____
   c. If YES, what species?
   _____
   _____
   _____

6. Which freshwater fish species do you normally eat?
   _____
   _____
   _____
   _____

7. How often do you eat freshwater fish? Please indicate the number of:
   _____ meals/day
   _____ meals/week
   _____ meals/month

8. Which saltwater fish species do you normally eat?
   _____
   _____
   _____
   _____

9. How often do you eat saltwater fish? Please indicate the number of:
   _____ meals/day
   _____ meals/week
   _____ meals/month

10. What percentage of your diet is freshwater fish?
    a. less than 25% _____
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

11. What percentage of your diet is saltwater fish?
    a. less than 25% _____
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

12. What percentage of your diet is fish harvested at Northeast Cape?
    a. less than 25% _____
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

13. How do you prepare fish for eating? For each species eaten, please describe what you do and what parts you eat (e.g., whole body, fillets, specific body parts, other).

_____
_____
_____
_____

14. What marine mammal species (e.g., whale, polar bear, walrus, seal) do you harvest from near Northeast Cape for eating?

_____
_____
_____
_____

15. During what time of year are marine mammals harvested at Northeast Cape?

_____
_____

and for how many days per year are they harvested?

_____
_____

16. Where specifically are the marine mammals harvested? (Please mark on the attached map where the marine mammals are harvested. Please use (MM) for the locations.)

_____
_____

17. How do you prepare the marine mammals for eating? Please describe what you do for each species eaten and what parts you eat.

_____
_____
_____
_____

18. How often do you eat marine mammals? Please indicate the number of:

_____ meals/day
_____ meals/week
_____ meals/month

19. What percentage of your diet consists of marine mammal species?

a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

20. What percentage of your diet consists of marine mammals harvested from the Northeast Cape?

a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

21. What land mammal species (e.g., reindeer) do you harvest from the Northeast Cape or from the Island for eating?

_____
_____
_____
_____

22. During what time of year are land mammals harvested at Northeast Cape?

_____
_____

and for how many days per year are they harvested?

_____
_____

23. Where specifically are the land mammals harvested? (Please mark on the attached map where the land mammals are harvested. Please use (LM) for the locations.)

_____
_____

24. How do you prepare the land mammals for eating? Please describe what you do for each species eaten and what parts you eat.

_____
_____
_____
_____

25. How often do you eat land mammals?

_____ meals/day
_____ meals/week
_____ meals/month

26. What percentage of your diet consists of land mammal species?

a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

27. What percentage of your diet consists of land mammal species harvested from the Northeast Cape?

a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

28. What plant species do you harvest from the Northeast Cape for eating?

_____
_____
_____
_____

for other uses (e.g., medicinal, spiritual, smoking, weaving, dying)?

29. What parts of the plants are consumed (e.g., leaves, stems, roots, berries)?

30. Which plants are usually found in lowland areas or near streams?

31. From where are the plants harvested? (Please mark on the attached map where the plants are harvested. Please use (P) for the plant locations.)

32. During what months are the plants harvested?

33. How often do you eat plants harvested from the Northeast Cape?
    _____ meals/day
    _____ meals/week
    _____ meals/month

34. What percentage of your diet consists of plants?
    a. less than 25% _____
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

35. What percentage of your diet consists of the plant species harvested from the Northeast Cape?
    a. less than 25% _____
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

36. Other than those food items already listed in you answers above, please list any other food items that are harvested from the Island's land or freshwater, or from the ocean surrounding the Island.

37. Please provide any other observations, comments?

38. Date the survey was completed.

39. Your name and age (optional).

40. May we contact you with questions? How may we reach you?

P. & A. Kingowiyi

2- person

Northeast Cape Site

The U.S. Army Corps of Engineers is investigating and remediating environmental conditions at the former military installation at Northeast Cape. In addition to the ongoing building demolition and hazardous waste removal activities, the Army Corps is conducting an analysis of potential risks to human health and the environment due to exposure to contaminants remaining at the site. As part of these efforts, additional fish sampling will be conducted in the Suqitughneq River.

Your help in answering the following questions will assist the Corps with planning the field investigation, and analyzing the potential for any site-related risks.

Questions:

1. What fish species are present in the vicinity of Northeast Cape?

   a. Current Salmon, Dolly Varden

   b. Historically (pre-1960 spill) NA

2. During what time of year did you historically fish at Northeast Cape?

   NA

   and for how many days per year were they harvested?

   NA

3. During what time of year are fish currently harvested at Northeast Cape?

   Summer

   and for how many days per year are they harvested?

   2 months July August

4. Where specifically are the freshwater and saltwater species currently harvested? (Please mark on the attached map where the freshwater and the saltwater fish are harvested. Please use (F) for the freshwater and (S) for the saltwater.)

   ✓ - Saltwater Only

5. Do you harvest fish from the estuary/lagoon area at the mouth of the Suqitughneq River drainage?
   a. YES _____
   b. NO X
   c. If YES, what species?

6. Which freshwater fish species do you normally eat?

   NA

7. How often do you eat freshwater fish? Please indicate the number of:
   NA meals/day
   _____ meals/week
   _____ meals/month

8. Which saltwater fish species do you normally eat?
   Salmon, Dolly Varden

9. How often do you eat saltwater fish? Please indicate the number of:
   _____ meals/day
   _____ meals/week
   2 meals/month

10. What percentage of your diet is freshwater fish?
    a. less than 25% X
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

11. What percentage of your diet is saltwater fish?
    a. less than 25% X
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

12. What percentage of your diet is fish harvested at Northeast Cape?
    a. less than 25% X
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

13. How do you prepare fish for eating? For each species eaten, please describe what you do and what parts you eat (e.g., whole body, fillets, specific body parts, other).

Fillet, Heads, Eggs, Raw, Cooked, Fried,

14. What marine mammal species (e.g., whale, polar bear, walrus, seal) do you harvest from near Northeast Cape for eating?

Walrus
Seal

15. During what time of year are marine mammals harvested at Northeast Cape?

April May

and for how many days per year are they harvested?

2 / Month

16. Where specifically are the marine mammals harvested? (Please mark on the attached map where the marine mammals are harvested. Please use (MM) for the locations.)

✓

17. How do you prepare the marine mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Walrus - liver, sediment, intestine, heart, blubber Boiled, Fried
Seal - " " " " ", Kidney Boiled, Fried, Dried

18. How often do you eat marine mammals? Please indicate the number of:

_____ meals/day
__2__ meals/week year round
_____ meals/month

19. What percentage of your diet consists of marine mammal species?

a. less than 25% X
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

20. What percentage of your diet consists of marine mammals harvested from the Northeast Cape?

a. less than 25% X
b. 26-50% _____
c. 51-75% _____
d. greater than 75% _____

21. What land mammal species (e.g., reindeer) do you harvest from the Northeast Cape or from the Island for eating?

Reindeer

22. During what time of year are land mammals harvested at Northeast Cape?

Fall - Thanksgiving

and for how many days per year are they harvested?

23. Where specifically are the land mammals harvested? (Please mark on the attached map where the land mammals are harvested. Please use (LM) for the locations.)

✓

24. How do you prepare the land mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Reindeer, FAT, MEAT, Heart, liver - Boiled, Fried

25. How often do you eat land mammals?

_____ meals/day
_____ meals/week
__1__ meals/month

26. What percentage of your diet consists of land mammal species?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

27. What percentage of your diet consists of land mammal species harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75% ~~X~~
d. greater than 75%

28. What plant species do you harvest from the Northeast Cape for eating?

Salmon Berries
Crow Berries

for other uses (e.g., medicinal, spiritual, smoking, weaving, dying)?

ϕ

29. What parts of the plants are consumed (e.g., leaves, stems, roots, berries)?

Berries

30. Which plants are usually found in lowland areas or near streams?

Salmon Berries, Crowberries

31. From where are the plants harvested? (Please mark on the attached map where the plants are harvested. Please use (P) for the plant locations.)

✓

32. During what months are the plants harvested?

July - August

33. How often do you eat plants harvested from the Northeast Cape?
    _____ meals/day
    _____ meals/week
    ___1___ meals/month

34. What percentage of your diet consists of plants?
    a. less than 25% ___X___
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

35. What percentage of your diet consists of the plant species harvested from the Northeast Cape?
    a. less than 25% ___X___
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

36. Other than those food items already listed in you answers above, please list any other food items that are harvested from the Island's land or freshwater, or from the ocean surrounding the Island.

ϕ

37. Please provide any other observations, comments?

ϕ

38. Date the survey was completed.

6/22/01

39. Your name and age (optional).

Adeline Pungowiyi, Perry Pungowiyi

40. May we contact you with questions? How may we reach you?

Yes 984-6311

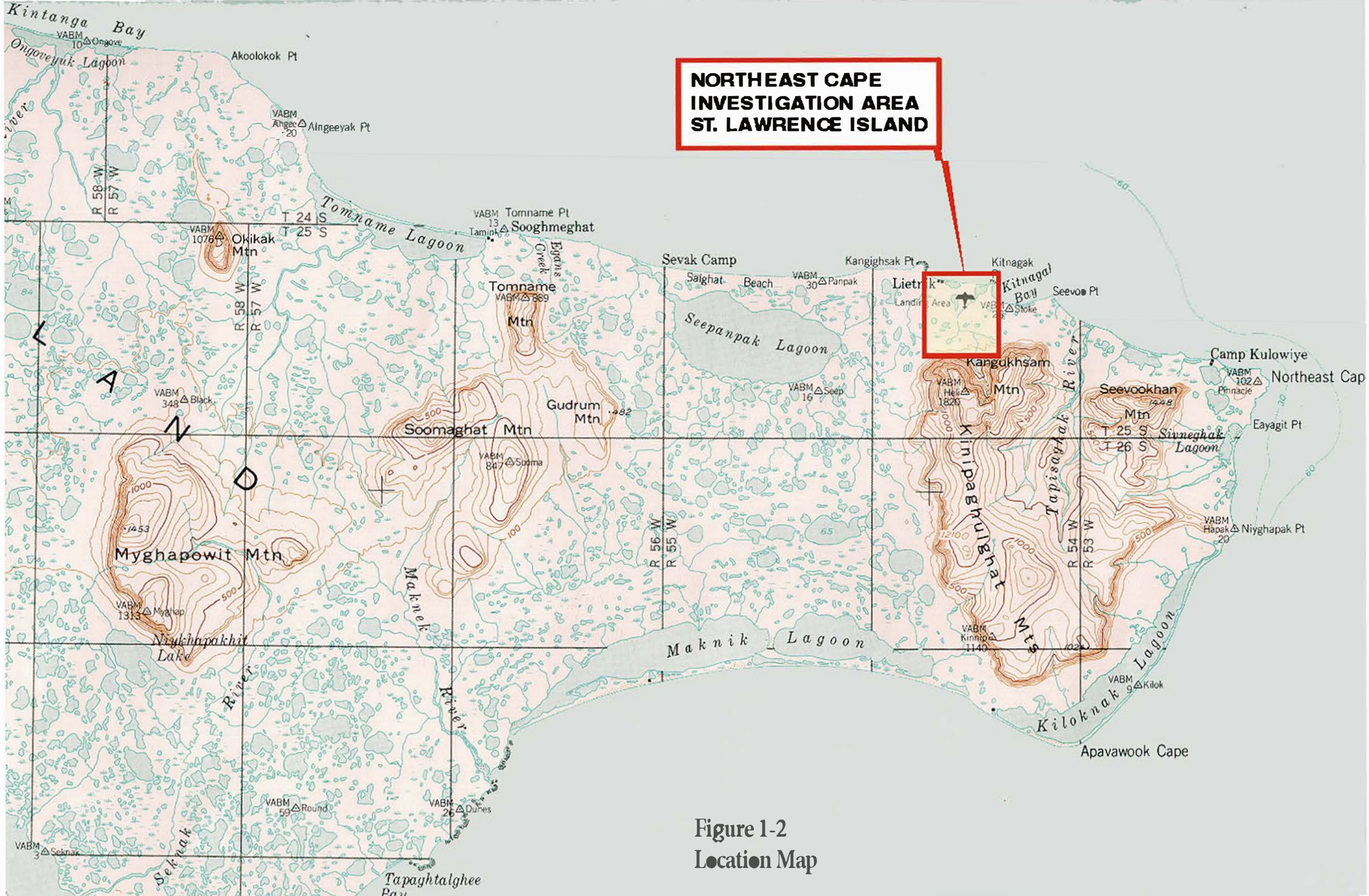
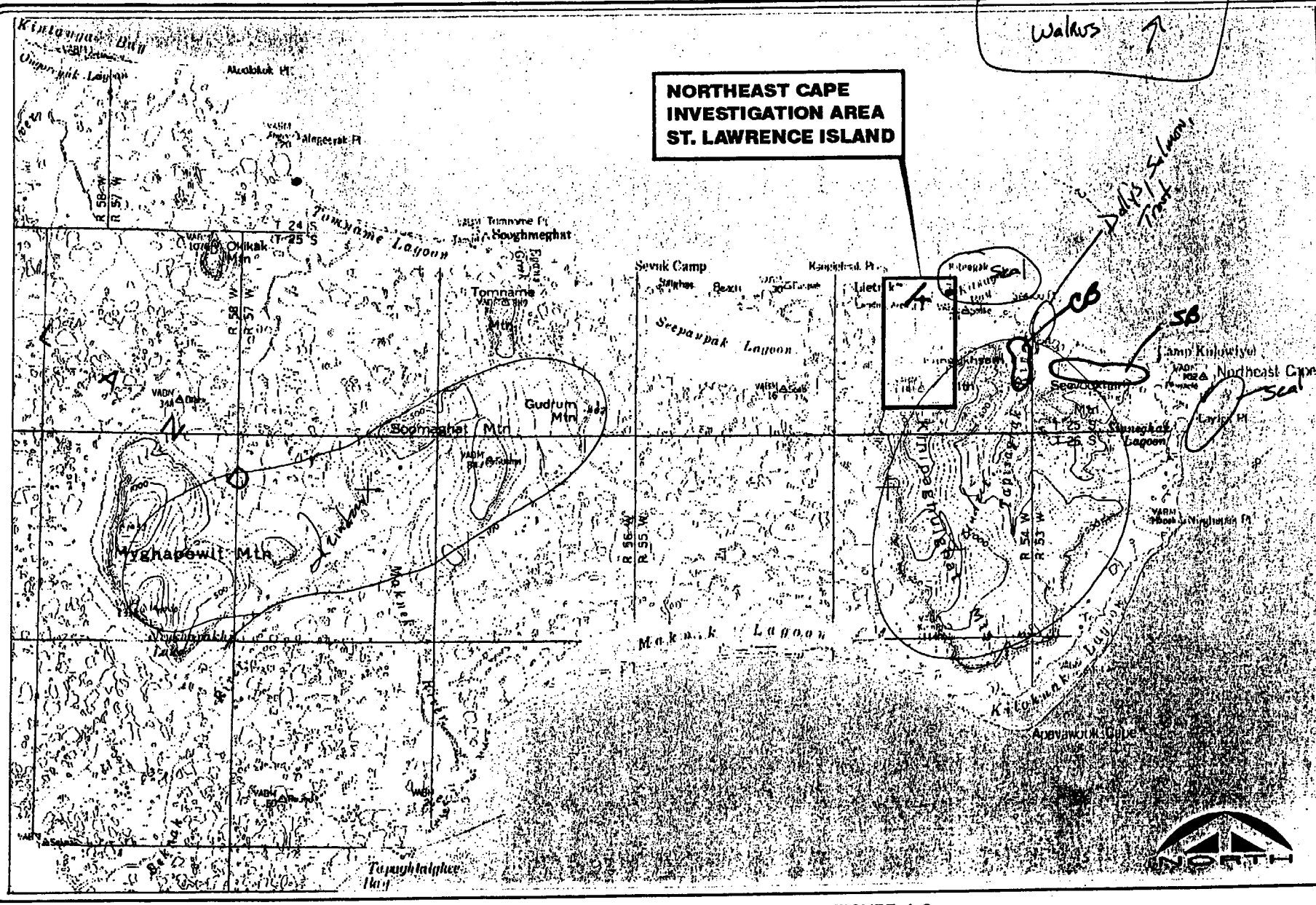


Figure 1-2
Location Map

JOB No. 883098.050140 TIME: 03-AUG-2000 16:44 FILE: e:\cad\proj\usace\necape\00ri_fs\draft\fig1_2.dgn



MONTGOMERY WATSON

Anchorage, Alaska

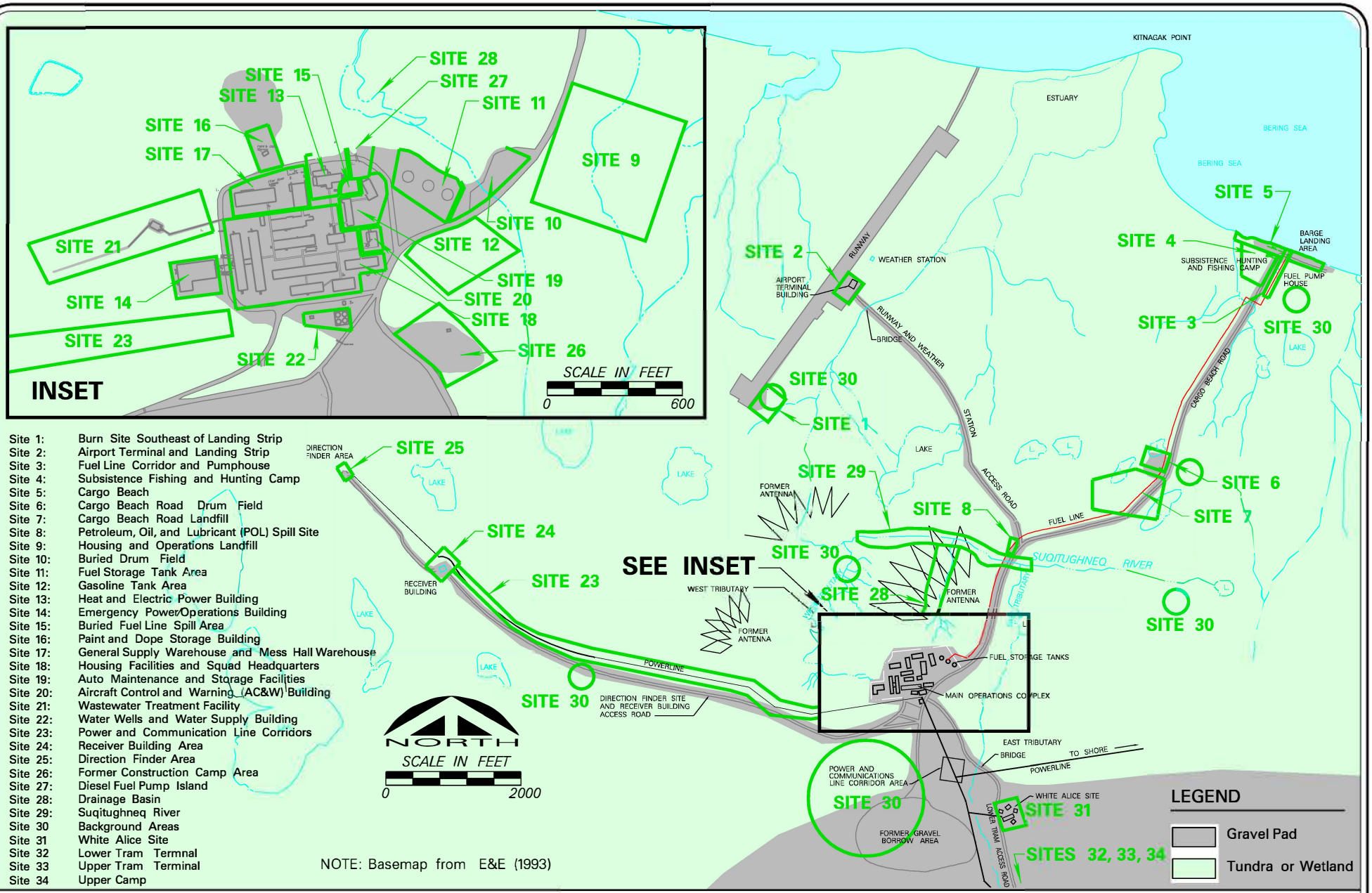
SOURCE: U.S. Geological Survey
Reston, Virginia 22092, 1976
St. Lawrence, Alaska
N6252 – W16830 /60x210
Surveyed 1948, Compiled 1957
Minor Revisions 1974
Scale 1:250,000, Contour Interv 00 Ft., Varies

FIGURE 1-2

U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

LOCATION MAP
NORTHEAST CAPE INVESTIGATION AREA

JOB No. 1189098.050140 TIME: 16-JAN-2002 13:08 FILE: E:\usace\necape\01rl_ph3\draft final\fig2-1.dgn



Site 1: Burn Site Southeast of Landing Strip
Site 2: Airport Terminal and Landing Strip
Site 3: Fuel Line Corridor and Pumphouse
Site 4: Subsistence Fishing and Hunting Camp
Site 5: Cargo Beach
Site 6: Cargo Beach Road Drum Field
Site 7: Cargo Beach Road Landfill
Site 8: Petroleum, Oil, and Lubricant (POL) Spill Site
Site 9: Housing and Operations Landfill
Site 10: Buried Drum Field
Site 11: Fuel Storage Tank Area
Site 12: Gasoline Tank Area
Site 13: Heat and Electric Power Building
Site 14: Emergency Power/Operations Building
Site 15: Buried Fuel Line Spill Area
Site 16: Paint and Dope Storage Building
Site 17: General Supply Warehouse and Mess Hall Warehouse
Site 18: Housing Facilities and Squad Headquarters
Site 19: Auto Maintenance and Storage Facilities
Site 20: Aircraft Control and Warning (AC&W) Building
Site 21: Wastewater Treatment Facility
Site 22: Water Wells and Water Supply Building
Site 23: Power and Communication Line Corridors
Site 24: Receiver Building Area
Site 25: Direction Finder Area
Site 26: Former Construction Camp Area
Site 27: Diesel Fuel Pump Island
Site 28: Drainage Basin
Site 29: Suqitughneq River
Site 30 Background Areas
Site 31 White Alice Site
Site 32 Lower Tram Termnal
Site 33 Upper Tram Terminal
Site 34 Upper Camp

NOTE: Basemap from E&E (1993)

MONTGOMERY WATSON

Anchorage, Alaska

FIGURE 1–3

U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

SITE MAP

[illegible] + Eugene [illegible]
2-people

Northeast Cape Site

The U.S. Army Corps of Engineers is investigating and remediating environmental conditions at the former military installation at Northeast Cape. In addition to the ongoing building demolition and hazardous waste removal activities, the Army Corps is conducting an analysis of potential risks to human health and the environment due to exposure to contaminants remaining at the site. As part of these efforts, additional fish sampling will be conducted in the Suqitughneq River.

Your help in answering the following questions will assist the Corps with planning the field investigation, and analyzing the potential for any site-related risks.

Questions:

1. What fish species are present in the vicinity of Northeast Cape?

   a. Current Salmon, Dolly Varden (Silvers, Chinooks, Reds, Pinks) Herring, Tom Cod, from Sesepaupak + Tapisaghak Rivers

   b. Historically (pre-1960 spill) Sugi - Salmon + Dollys.

2. During what time of year did you historically fish at Northeast Cape?

   Summer

   and for how many days per year were they harvested?

   All Summer 2 months

3. During what time of year are fish currently harvested at Northeast Cape?

   Summer

   and for how many days per year are they harvested?

   2 months.

4. Where specifically are the freshwater and saltwater species currently harvested? (Please mark on the attached map where the freshwater and the saltwater fish are harvested. Please use (F) for the freshwater and (S) for the saltwater.)

   No Freshwater only Saltwater

4/17/01

5. Do you harvest fish from the estuary/lagoon area at the mouth of the Suqitughneq River drainage?
   a. YES X
   b. NO _____
   c. If YES, what species?

Salmon, Dollys Not much since spill

6. Which freshwater fish species do you normally eat?

ϕ

7. How often do you eat freshwater fish? Please indicate the number of:
   ϕ meals/day
   _____ meals/week
   _____ meals/month

8. Which saltwater fish species do you normally eat?

Salmon, Dolly Varden, Herring, Tom Cod

9. How often do you eat saltwater fish? Please indicate the number of:
   _____ meals/day
   2-3 meals/week Summer / 1 meal/week Dried
   _____ meals/month

10. What percentage of your diet is freshwater fish?
    a. less than 25% Not
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

11. What percentage of your diet is saltwater fish?
    a. less than 25% X
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

12. What percentage of your diet is fish harvested at Northeast Cape?
    a. less than 25% X NEC
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% X Seepanpak, Tapisaghak Rivers

13. How do you prepare fish for eating? For each species eaten, please describe what you do and what parts you eat (e.g., whole body, fillets, specific body parts, other).

Fillets, Eggs, Heads — Dried, Cooked, Fried, Boiled, Raw — Salmon, Dollys
Whole — fried, Cooked — Herring, Tom Cod

14. What marine mammal species (e.g., whale, polar bear, walrus, seal) do you harvest from near Northeast Cape for eating?

Walrus
Seal
Polar Bear - very Rare

15. During what time of year are marine mammals harvested at Northeast Cape?

Walrus & Seal April/May
Polar Bear rare but in April May before the ice goes out, or any time if stranded.

and for how many days per year are they harvested?

2 / Month

16. Where specifically are the marine mammals harvested? (Please mark on the attached map where the marine mammals are harvested. Please use (MM) for the locations.)

✓

17. How do you prepare the marine mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Walrus - liver, Redmeat, intestins, heard, blubber — Boil, Fry,
Seal - liver, Redmeat, intestins, heart, blubber, Kidneys — Boil, Fry, Dried
Polar Bear - Red Meat very rarely. Cooked very well

18. How often do you eat marine mammals? Please indicate the number of:

_____ meals/day
3 meals/week year round
_____ meals/month

19. What percentage of your diet consists of marine mammal species?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

20. What percentage of your diet consists of marine mammals harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

21. What land mammal species (e.g., reindeer) do you harvest from the Northeast Cape or from the Island for eating?

Reindeer Only

22. During what time of year are land mammals harvested at Northeast Cape?

July August

and for how many days per year are they harvested?

1 or 2 Reindeer per household per year

23. Where specifically are the land mammals harvested? (Please mark on the attached map where the land mammals are harvested. Please use (LM) for the locations.)

✓

24. How do you prepare the land mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Redmeat, heart, Kidney, Fat Boiled, Fried, Roasted, Dried

25. How often do you eat land mammals?

_____ meals/day
__2__ meals/week July / August
_____ meals/month

26. What percentage of your diet consists of land mammal species?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

27. What percentage of your diet consists of land mammal species harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

28. What plant species do you harvest from the Northeast Cape for eating?

Crowberries, Salmonberries, Cloudberries
Roseroot, Siberian Spring Beauty, Dock, Willow, Saxifrage, Lousewort, Shakoreed
Lowbush cranberry.

for other uses (e.g., medicinal, spiritual, smoking, weaving, dying)?
Willow - Medicinal

29. What parts of the plants are consumed (e.g., leaves, stems, roots, berries)?

Leaves, Roots, Berries.

30. Which plants are usually found in lowland areas or near streams?

Cranberries, Salmonberries, Cloudberries,
Roseroot / Mountains - Tapisaghak River

31. From where are the plants harvested? (Please mark on the attached map where the plants are harvested. Please use (P) for the plant locations.)

✓

32. During what months are the plants harvested?

July / August - Freeze for Winter

33. How often do you eat plants harvested from the Northeast Cape?

_____ meals/day
_____ meals/week
3 meals/month

34. What percentage of your diet consists of plants?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

35. What percentage of your diet consists of the plant species harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

36. Other than those food items already listed in you answers above, please list any other food items that are harvested from the Island's land or freshwater, or from the ocean surrounding the Island.

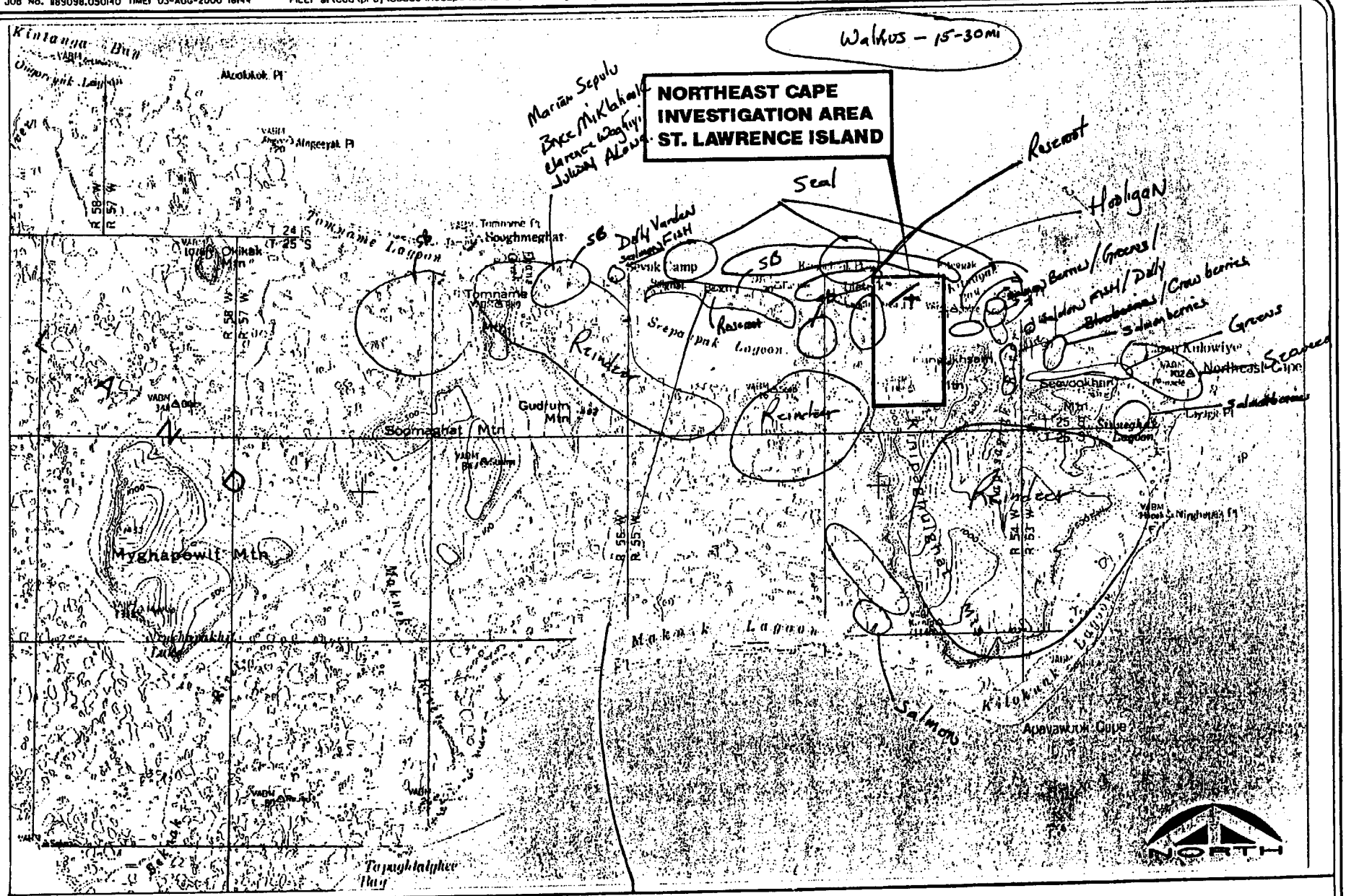
✓

37. Please provide any other observations, comments?

38. Date the survey was completed.
6/22/01

39. Your name and age (optional).
Marie Toelit 53, Eugene Toelit 62

40. May we contact you with questions? How may we reach you?
Yes 984-624



MONTGOMERY WATSON

Anchorage, Alaska

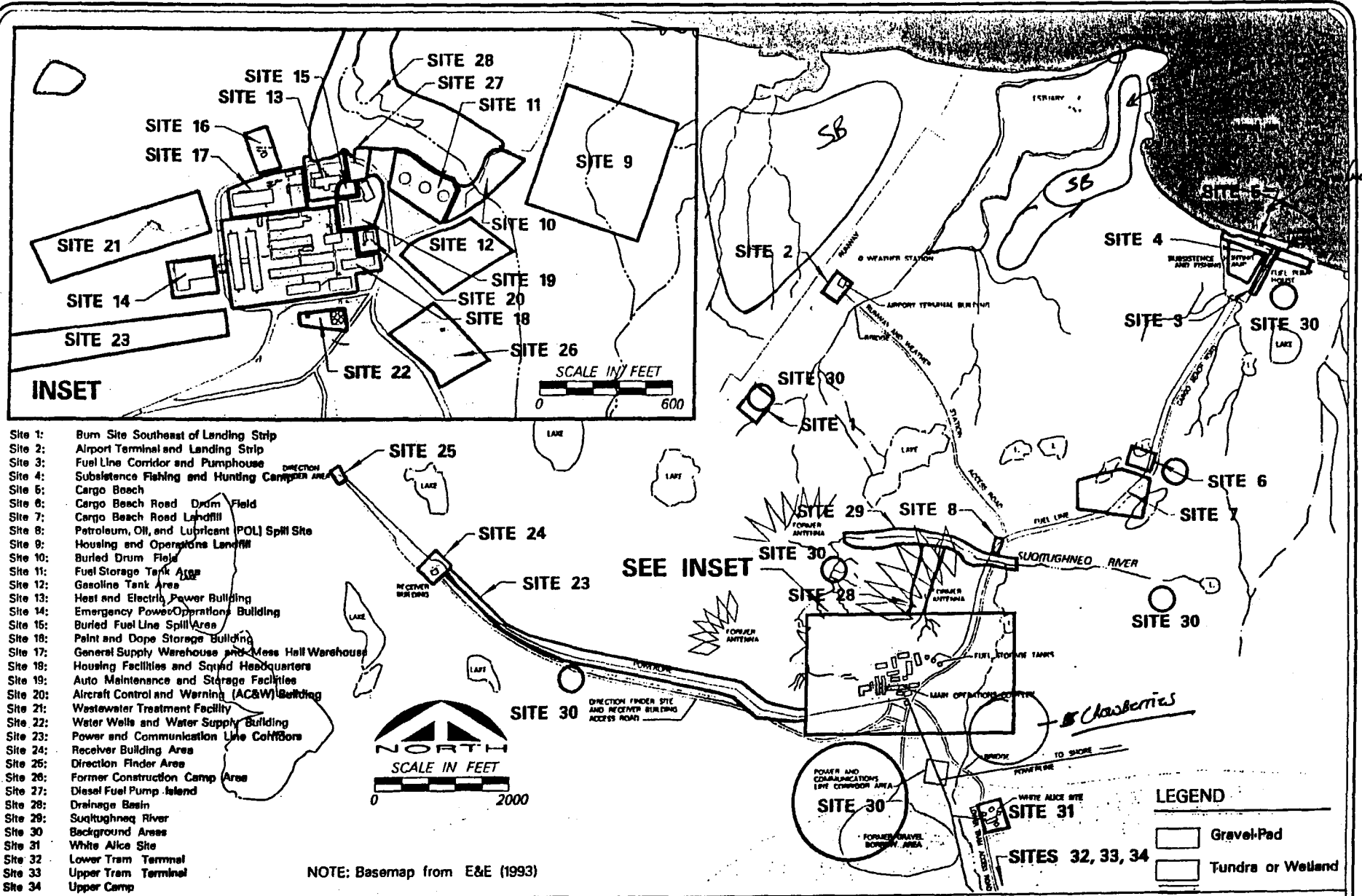
SOURCE: U.S. Geological Survey
Reston, Virginia 22092, 1976
St. Lawrence, Alaska
N6252 – W16830 /60x210
Surveyed 1948, Compiled 1957
Minor Revisions 1974
Scale 1:250,000, Contour Interv 00 Ft., Varies

FIGURE 1–2

U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

LOCATION MAP
NORTHEAST CAPE INVESTIGATION AREA

JOB No. 189098.050140 TIME: 03-AUG-2000 16:45 FILE: s:\cad\proj\usace\necape\00rl_fs\draft\fig1_3.dgn



Site 1: Burn Site Southeast of Landing Strip
Site 2: Airport Terminal and Landing Strip
Site 3: Fuel Line Corridor and Pumphouse
Site 4: Subsistence Fishing and Hunting Camp
Site 5: Cargo Beach
Site 6: Cargo Beach Road Drum Field
Site 7: Cargo Beach Road Landfill
Site 8: Petroleum, Oil, and Lubricant (POL) Spill Site
Site 9: Housing and Operations Landfill
Site 10: Buried Drum Field
Site 11: Fuel Storage Tank Area
Site 12: Gasoline Tank Area
Site 13: Heat and Electric Power Building
Site 14: Emergency Power/Operations Building
Site 15: Buried Fuel Line Spill Area
Site 16: Paint and Dope Storage Building
Site 17: General Supply Warehouse and Mess Hall Warehouse
Site 18: Housing Facilities and Squad Headquarters
Site 19: Auto Maintenance and Storage Facilities
Site 20: Aircraft Control and Warning (AC&W) Building
Site 21: Wastewater Treatment Facility
Site 22: Water Wells and Water Supply Building
Site 23: Power and Communication Line Corridors
Site 24: Receiver Building Area
Site 25: Direction Finder Area
Site 26: Former Construction Camp Area
Site 27: Diesel Fuel Pump Island
Site 28: Drainage Basin
Site 29: Suqtughneq River
Site 30: Background Areas
Site 31: White Alice Site
Site 32: Lower Tram Terminal
Site 33: Upper Tram Terminal
Site 34: Upper Camp

NOTE: Basemap from E&E (1993)

MONTGOMERY WATSON
Anchorage, Alaska

FIGURE 1-3
U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

SITE MAP

Clarence Waghiyi

Northeast Cape Site

The U.S. Army Corps of Engineers is investigating and remediating environmental conditions at the former military installation at Northeast Cape. In addition to the ongoing building demolition and hazardous waste removal activities, the Army Corps is conducting an analysis of potential risks to human health and the environment due to exposure to contaminants remaining at the site. As part of these efforts, additional fish sampling will be conducted in the Suqitughneq River.

Your help in answering the following questions will assist the Corps with planning the field investigation, and analyzing the potential for any site-related risks.

Questions:

1. What fish species are present in the vicinity of Northeast Cape?

   a. Current Dolly, Trout, Arctic Char

   b. Historically (pre-1960 spill) Salmon, Dolly

2. During what time of year did you historically fish at Northeast Cape?

   July / August

   and for how many days per year were they harvested?

3. During what time of year are fish currently harvested at Northeast Cape?

   and for how many days per year are they harvested?

   July / August

4. Where specifically are the freshwater and saltwater species currently harvested? (Please mark on the attached map where the freshwater and the saltwater fish are harvested. Please use (F) for the freshwater and (S) for the saltwater.)

   All Saltwater

5. Do you harvest fish from the estuary/lagoon area at the mouth of the Suqitughneq River drainage?
   a. YES ____
   b. NO X
   c. If YES, what species?
   _____

6. Which freshwater fish species do you normally eat?
   Fish

7. How often do you eat freshwater fish? Please indicate the number of:
   X meals/day
   ____ meals/week
   ____ meals/month

8. Which saltwater fish species do you normally eat?
   Dolly, Trout

9. How often do you eat saltwater fish? Please indicate the number of:
   ____ meals/day
   ____ meals/week
   2 meals/~~month~~ year

10. What percentage of your diet is freshwater fish?
    a. less than 25% X NA
    b. 26-50% ____
    c. 51-75% ____
    d. greater than 75% ____

11. What percentage of your diet is saltwater fish?
    a. less than 25% X
    b. 26-50% ____
    c. 51-75% ____
    d. greater than 75% ____

12. What percentage of your diet is fish harvested at Northeast Cape?
    a. less than 25% X
    b. 26-50% ____
    c. 51-75% ____
    d. greater than 75% ____

13. How do you prepare fish for eating? For each species eaten, please describe what you do and what parts you eat (e.g., whole body, fillets, specific body parts, other).

Meat, Head, Eggs, Occasional Arctic Char

14. What marine mammal species (e.g., whale, polar bear, walrus, seal) do you harvest from near Northeast Cape for eating?

Walrus
Seal

15. During what time of year are marine mammals harvested at Northeast Cape?

Spring Only. April May

and for how many days per year are they harvested?

2 Months.

16. Where specifically are the marine mammals harvested? (Please mark on the attached map where the marine mammals are harvested. Please use (MM) for the locations.)

✓

17. How do you prepare the marine mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Walrus, Lard, Redmeat intestine, head, blubber. Kidneys (rarely),
Seal, " " " " " , Kidneys
X

18. How often do you eat marine mammals? Please indicate the number of:

_____ meals/day
3 meals/week –
_____ meals/month

19. What percentage of your diet consists of marine mammal species?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

20. What percentage of your diet consists of marine mammals harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

21. What land mammal species (e.g., reindeer) do you harvest from the Northeast Cape or from the Island for eating?

Reindeer

22. During what time of year are land mammals harvested at Northeast Cape?

August / Nov.

and for how many days per year are they harvested?

23. Where specifically are the land mammals harvested? (Please mark on the attached map where the land mammals are harvested. Please use (LM) for the locations.)

✓

24. How do you prepare the land mammals for eating? Please describe what you do for each species eaten and what parts you eat.

Reindeer Only
Meat, Heart, Liver, Fat, Raw, Cooked, Boiled, Fried

25. How often do you eat land mammals?

_____ meals/day
_____ meals/week
1 meals/month

26. What percentage of your diet consists of land mammal species?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

27. What percentage of your diet consists of land mammal species harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

28. What plant species do you harvest from the Northeast Cape for eating?

Salmon Berries, Cloud Berries.

for other uses (e.g., medicinal, spiritual, smoking, weaving, dying)?

29. What parts of the plants are consumed (e.g., leaves, stems, roots, berries)?

Berry).

30. Which plants are usually found in lowland areas or near streams?

SB, CB Salmonberries, Crowberries.

31. From where are the plants harvested? (Please mark on the attached map where the plants are harvested. Please use (P) for the plant locations.)

✓

32. During what months are the plants harvested?

August

33. How often do you eat plants harvested from the Northeast Cape?

_____ meals/day
_____ meals/week
_2_ meals/month save for winter

34. What percentage of your diet consists of plants?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

35. What percentage of your diet consists of the plant species harvested from the Northeast Cape?

a. less than 25% X
b. 26-50%
c. 51-75%
d. greater than 75%

36. Other than those food items already listed in you answers above, please list any other food items that are harvested from the Island's land or freshwater, or from the ocean surrounding the Island.

37. Please provide any other observations, comments?

38. Date the survey was completed.

6/22/01

39. Your name and age (optional).

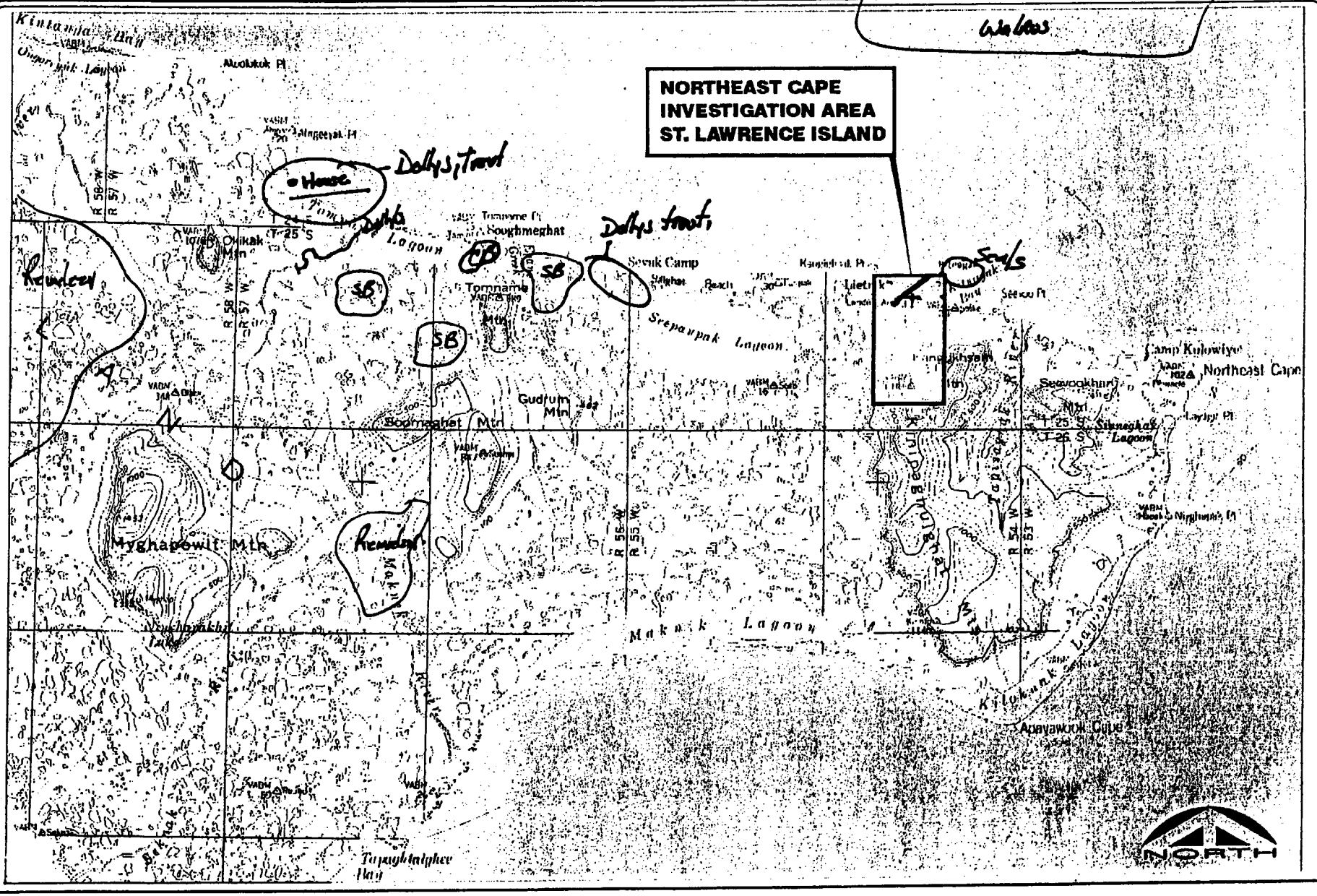
Clarence Waghiyi / 69 3/4

40. May we contact you with questions? How may we reach you?

Yes 784 6226

Clarence Waghiyi

JOB No. 889098.050140 TIME: 03-AUG-2000 16:44 FILE: s:\cad\proj\usace\necape\00ri_fs\draft\fig1_2.dgn



MONTGOMERY WATSON

Anchorage, Alaska

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N6252 – W16830 /60x210
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Scale 1:250,000, Contour Interv 00 Ft., Varies

FIGURE 1-2

U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

LOCATION MAP
NORTHEAST CAPE INVESTIGATION AREA

Northeast Cape Site

The U.S. Army Corps of Engineers is investigating and remediating environmental conditions at the former military installation at Northeast Cape. In addition to the ongoing building demolition and hazardous waste removal activities, the Army Corps is conducting an analysis of potential risks to human health and the environment due to exposure to contaminants remaining at the site. As part of these efforts, additional fish sampling will be conducted in the Suqitughneq River.

Your help in answering the following questions will assist the Corps with planning the field investigation, and analyzing the potential for any site-related risks.

Questions:

1. What fish species are present in the vicinity of Northeast Cape?

   a. Current _____

   b. Historically (pre-1960 spill) trout, white fish

2. During what time of year did you historically fish at Northeast Cape?
   year round

   and for how many days per year were they harvested?
   Summer - 4-5 days. fall - 4-5 days
   winter 4-5 days

3. During what time of year are fish currently harvested at Northeast Cape?
   winter

   and for how many days per year are they harvested?
   4-5 days

4. Where specifically are the freshwater and saltwater species currently harvested? (Please mark on the attached map where the freshwater and the saltwater fish are harvested. Please use (F) for the freshwater and (S) for the saltwater.)

5. Do you harvest fish from the estuary/lagoon area at the mouth of the Suqitughneq River drainage?
   a. YES _____
   b. NO _____
   c. If YES, what species?
   _____

6. Which freshwater fish species do you normally eat?
   trout, white fish

7. How often do you eat freshwater fish? Please indicate the number of:
   _____ meals/day
   _____ meals/week
   3 meals/month

8. Which saltwater fish species do you normally eat?
   sculpin, halibut, salmon, rainbow trout, tom cods

9. How often do you eat saltwater fish? Please indicate the number of:
   _____ meals/day
   _____ meals/week
   3 meals/month

10. What percentage of your diet is freshwater fish?
    a. less than 25% _____
    b. 26-50% X
    c. 51-75% _____
    d. greater than 75% _____

11. What percentage of your diet is saltwater fish?
    a. less than 25% _____
    b. 26-50% X
    c. 51-75% _____
    d. greater than 75% _____

12. What percentage of your diet is fish harvested at Northeast Cape?
    a. less than 25% X
    b. 26-50% _____
    c. 51-75% _____
    d. greater than 75% _____

13. How do you prepare fish for eating? For each species eaten, please describe what you do and what parts you eat (e.g., whole body, fillets, specific body parts, other).
tom cods - eggs and liver
salmon eggs - age them
these and all over species everything except eggs and livers

14. What marine mammal species (e.g., whale, polar bear, walrus, seal) do you harvest from near Northeast Cape for eating?
minke whale; Gray whale; walrus, seals; muckluks; murres & eggs; ducks;

15. During what time of year are marine mammals harvested at Northeast Cape?
year round

and for how many days per year are they harvested?
2-3 days a month

16. Where specifically are the marine mammals harvested? (Please mark on the attached map where the marine mammals are harvested. Please use (MM) for the locations.)

17. How do you prepare the marine mammals for eating? Please describe what you do for each species eaten and what parts you eat.
whales - meat; walrus everything except the balls and ovaries; seals; muckluk same as walrus; birds meat & back and breast

18. How often do you eat marine mammals? Please indicate the number of:
1 meals/day
5 meals/week
_____ meals/month

19. What percentage of your diet consists of marine mammal species?
a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% X

20. What percentage of your diet consists of marine mammals harvested from the Northeast Cape?
a. less than 25% _____
b. 26-50% _____
c. 51-75% _____
d. greater than 75% X

21. What land mammal species (e.g., reindeer) do you harvest from the Northeast Cape or from the Island for eating?

reindeer

22. During what time of year are land mammals harvested at Northeast Cape?

spring and November

and for how many days per year are they harvested?

2-3

23. Where specifically are the land mammals harvested? (Please mark on the attached map where the land mammals are harvested. Please use (LM) for the locations.)

24. How do you prepare the land mammals for eating? Please describe what you do for each species eaten and what parts you eat.

reindeer - everything but the innards

25. How often do you eat land mammals?

_____ meals/day
_____ meals/week
3 meals/month

26. What percentage of your diet consists of land mammal species?

a. less than 25% _____
b. 26-50% X
c. 51-75% _____
d. greater than 75% _____

27. What percentage of your diet consists of land mammal species harvested from the Northeast Cape?

a. less than 25% _____
b. 26-50% _____
c. 51-75% X
d. greater than 75% _____

28. What plant species do you harvest from the Northeast Cape for eating?

for other uses (e.g., medicinal, spiritual, smoking, weaving, dying)?

______

29. What parts of the plants are consumed (e.g., leaves, stems, roots, berries)?

______

30. Which plants are usually found in lowland areas or near streams?
Nunivak
Kiglluk
river greens after the river dries up

31. From where are the plants harvested? (Please mark on the attached map where the plants are harvested. Please use (P) for the plant locations.)

______

32. During what months are the plants harvested?
Spring; summer

33. How often do you eat plants harvested from the Northeast Cape?
______ meals/day
______ meals/week
4 meals/month

34. What percentage of your diet consists of plants?

a. less than 25% ______
b. 26-50% ______
c. 51-75% X
d. greater than 75% ______

35. What percentage of your diet consists of the plant species harvested from the Northeast Cape?

a. less than 25% ______
b. 26-50% ______
c. 51-75% X
d. greater than 75% ______

36. Other than those food items already listed in you answers above, please list any other food items that are harvested from the Island's land or freshwater, or from the ocean surrounding the Island.
seafood peaches; cucumber
seaweed

37. Please provide any other observations, comments?

fish depleted at N.E. Cape
Dolphin carrier are tissues and high
for the last 3yrs
People that lived or worked at N.E have
died ? cancer, liver dysfunction or
Kidney dysfunction

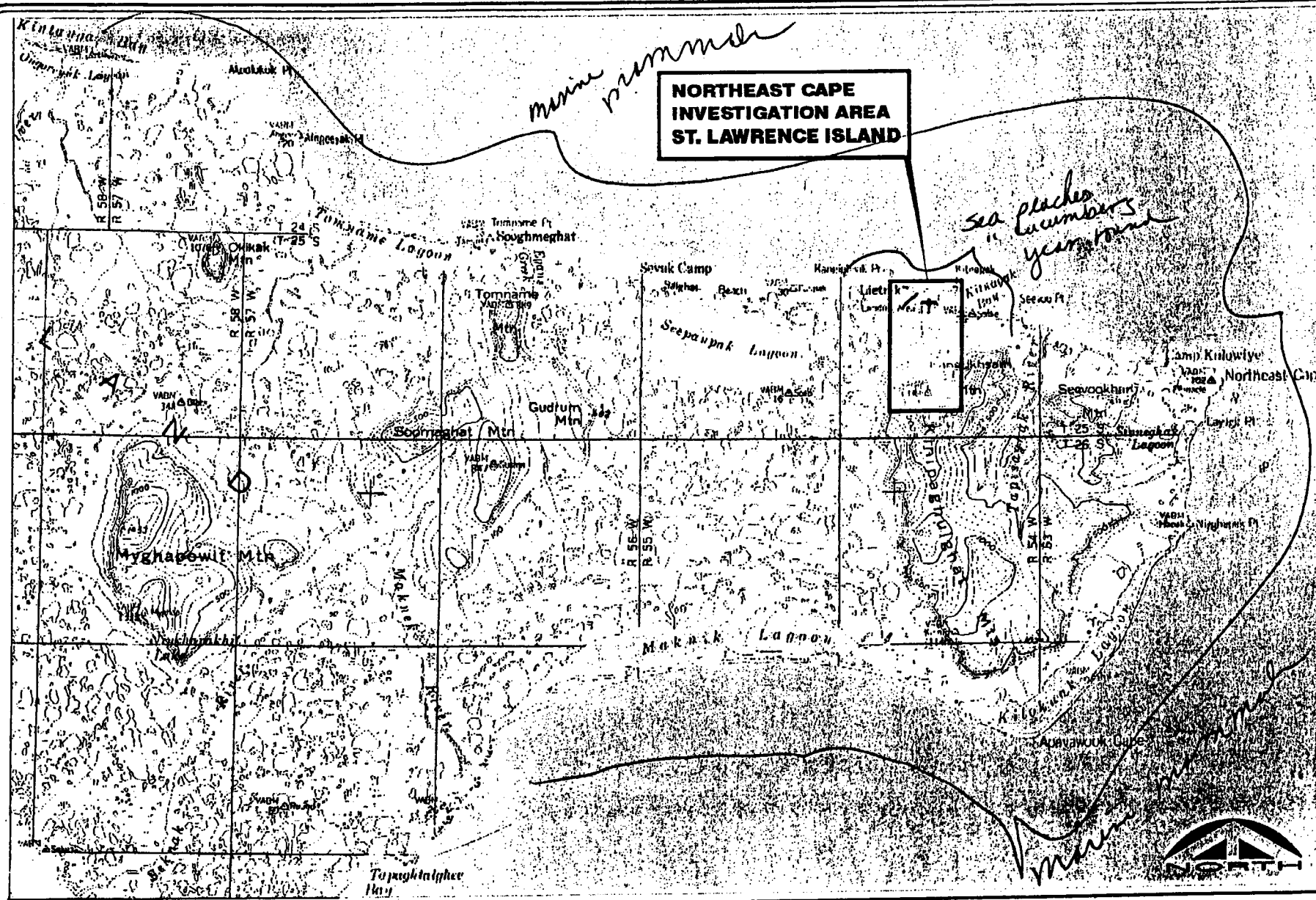
38. Date the survey was completed.

6-22-01

39. Your name and age (optional).

40. May we contact you with questions? How may we reach you?

JOB No. 889098.050040 TIME: 03-AUG-2000 16:44 FILE: s:\cad\proj\usace\necape\00rl_fs\draft\fig1_2.dgn



MONTGOMERY WATSON

Anchorage, Alaska

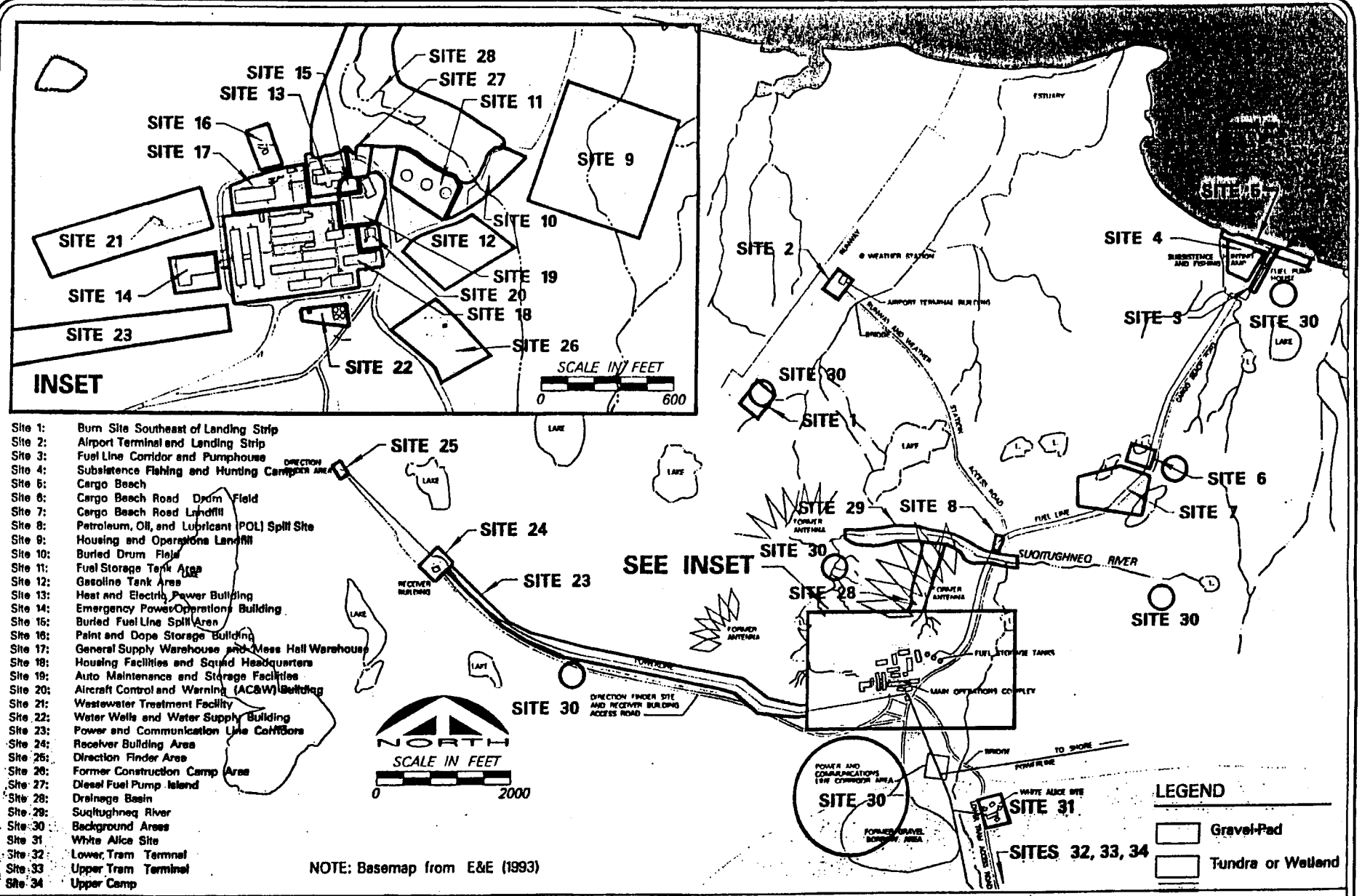
SOURCE: U.S. Geological Survey
Reston, Virginia 22092, 1976
St. Lawrence, Alaska
N6252 – W16830 /60x210
Surveyed 1948, Compiled 1957
Minor Revisions 1974
Scale 1:250,000, Contour Interv 00 Ft., Varies

FIGURE 1-2

U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

LOCATION MAP
NORTHEAST CAPE INVESTIGATION AREA

JOB No. 189098.050140 TIME: 03-AUG-2000 16:45 FILE: e:\cad\proj\usace\necape\00rl_fs\draft\fig1_3.dgn



Site 1: Burn Site Southeast of Landing Strip
Site 2: Airport Terminal and Landing Strip
Site 3: Fuel Line Corridor and Pumphouse
Site 4: Subsistence Fishing and Hunting Camps
Site 5: Cargo Beach
Site 6: Cargo Beach Road Drum Field
Site 7: Cargo Beach Road Landfill
Site 8: Petroleum, Oil, and Lubricant (POL) Spill Site
Site 9: Housing and Operations Landfill
Site 10: Buried Drum Field
Site 11: Fuel Storage Tank Area
Site 12: Gasoline Tank Area
Site 13: Heat and Electric Power Building
Site 14: Emergency Power/Operations Building
Site 15: Buried Fuel Line Spill Area
Site 16: Paint and Dope Storage Building
Site 17: General Supply Warehouse and Mess Hall Warehouse
Site 18: Housing Facilities and Squad Headquarters
Site 19: Auto Maintenance and Storage Facilities
Site 20: Aircraft Control and Warning (AC&W) Building
Site 21: Wastewater Treatment Facility
Site 22: Water Wells and Water Supply Building
Site 23: Power and Communication Line Corridors
Site 24: Receiver Building Area
Site 25: Direction Finder Area
Site 26: Former Construction Camp Area
Site 27: Diesel Fuel Pump Island
Site 28: Drainage Basin
Site 29: Suqitughneq River
Site 30: Background Areas
Site 31: White Alice Site
Site 32: Lower Tram Terminal
Site 33: Upper Tram Terminal
Site 34: Upper Camp

NOTE: Basemap from E&E (1993)

MONTGOMERY WATSON
Anchorage, Alaska

FIGURE 1-3
U.S. ARMY ENGINEER DISTRICT, ALASKA
N.E. CAPE – ST. LAWRENCE ISLAND, ALASKA

SITE MAP

APPENDIX D

Example Dose and Risk Calculations for Human and Ecological Receptors

HUMAN HEALTH EXPOSURE DOSE EQUATIONS

The example calculations below derive the total chemical-specific risk for Arsenic in soil at Site 9. This is a cancer risk calculation for a future permanent resident. Exposure parameters for this receptor are available in Table 3-6, Table 3-9, Table D-1 and Table D-2, where applicable.

- **INGESTION EXPOSURE PATHWAY**

$$\text{Ingestion Intake of Soil/Sediment/Dust (mg/kg-day)} = \frac{CS \times IR \times CF \times EF \times ED}{BW \times AT}$$

Where:

CS	= Concentration in soil (milligrams per kilogram [mg/kg])
IR	= Ingestion rate (milligrams [mg] soil/day)
CF	= Conversion factor (10^{-6}kg/mg)
EF	= Exposure frequency (days/year)
ED	= Exposure duration (years)
BW	= Body weight (kilogram [kg])
AT	= Averaging time (period over which exposure is averaged – days)

The ingestion equation is used for both the adult and then the child receptors. The results are added together to attain an overall ingestion exposure pathway for human receptors.

Adult: $\frac{(17 \text{ mg/kg} \times 100 \text{ mg/kg-day} \times 10^{-6}\text{kg/mg} \times 270 \text{ days/year} \times 24 \text{ years})}{(70 \text{ kg} \times 25{,}550 \text{ days})} = 6.2\text{E-}06 \text{ mg/kg-d}$

Child: $\frac{(17 \text{ mg/kg} \times 200 \text{ mg/kg-day} \times 10^{-6}\text{kg/mg} \times 270 \text{ days/year} \times 6 \text{ years})}{(15 \text{ kg} \times 25{,}550 \text{ days})} = 1.4\text{E-}05 \text{ mg/kg-d}$

The adult and child soil ingestion doses are then added together to arrive at 2.1E-05 mg/kg-day. That value is then multiplied by the oral cancer slope factor for arsenic, 1.5E+00 $(\text{mg/kg-day})^{-1}$, to arrive at the pathway-specific cancer risk of 3.0E-05.

Soil ingestion pathway specific cancer risk	=	Soil Ingestion dose (mg/kg-day)	x	CSF $(\text{mg/kg-day})^{-1}$
3.1E-05	=	2.1E-05 mg/kg-d	x	1.5E+00 $(\text{mg/kg-day})^{-1}$

CSF = Cancer Slope Factor

- **DERMAL EXPOSURE PATHWAY**

$$\text{Dermal Intake for Soil/Sediment/Dust (mg/kg-day)} = \frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

CS	= Concentration in soil (mg/kg)
CF	= Conversion factor (10^{-6} kg/mg)
SA	= Skin surface area exposed (square centimeter [cm^2])
AF	= Adherence factor of soil (mg/cm^2-day)
ABS	= Skin absorption factor (unitless)
EF	= Exposure frequency (days/year)
ED	= Exposure duration (years)
BW	= Body weight (kg)
AT	= Averaging time (period over which exposure is averaged–days)

The dermal equation is used for both the adult and then the child receptors. The results are added together to attain an overall dermal exposure pathway for human receptors.

Adult: $\frac{(17\ mg/kg \times 10^{-6}\ kg/mg \times 3{,}300\ cm^2 \times 0.2\ mg/cm^2\text{-day} \times 0.03 \times 270\ days/yr \times 24\ yrs)}{(70\ kg \times 25{,}550\ days)} = 1.2E\text{-}06\ mg/kg\text{-}d$

Child: $\frac{(17\ mg/kg \times 10^{-6}\ kg/mg \times 2{,}800\ cm^2 \times 0.2\ mg\ cm^2\text{-day} \times 0.03 \times 270\ days/yr \times 6\ yrs)}{(15\ kg \times 25{,}550\ days)} = 1.2E\text{-}06\ mg/kg\text{-}d$

The adult and child soil dermal doses are then added together to arrive at 2.4E-06 mg/kg-day. That value is then multiplied by the dermal cancer slope factor for arsenic, 1.5E+00 $(mg/kg\text{-}day)^{-1}$, to arrive at the pathway-specific cancer risk of 3.6E-06.

Soil dermal pathway specific cancer risk	=	Soil Dermal dose (mg/kg-day)	x	CSF $(mg/kg\text{-}day)^{-1}$
3.6E-06	=	2.4E-06 (mg/kg-day)	x	1.5E+00 $(mg/kg\text{-}day)^{-1}$

- **INHALATION EXPOSURE PATHWAY**

$$\text{Inhalation Intake for Indoor Dust (mg/kg-day)} = \frac{CS \times (1/PEF) \times InhR \times EF \times ED}{BW \times AT}$$

Where:

CS	= Concentration in soil (mg/kg)
PEF	= Particulate emission factor (1.3E+09) (cubic meters [m^3]/kg)
InhR	= Inhalation rate (m^3/day)
EF	= Exposure frequency (days/year)
ED	= Exposure duration (years)
BW	= Body weight (kg)
AT	= Averaging time (period over which exposure is averaged – days)

The inhalation equation is used for both the adult and then the child receptors. The results are added together to attain an overall inhalation exposure pathway for human receptors.

Adult: $\frac{(17mg/kg \times (1/1.3E{+}09\ m^3/kg) \times 20\ m^3/day \times 270\ days/yr \times 24\ yrs)}{(70\ kg \times 25{,}550\ days)} = 9.5E\text{-}10\ mg/kg\text{-}d$

Child: $\frac{(17mg/kg \times (1/1.3E{+}09\ m^3/kg) \times 10\ m^3/day \times 270\ days/yr \times 6\ yrs)}{(15\ kg \times 25{,}550\ days)} = 5.5E\text{-}10\ mg/kg\text{-}d$

The adult and child soil inhalation doses are then added together to arrive at 1.5E-09 mg/kg-day. That value is then multiplied by the inhalation cancer slope factor for arsenic, 1.5E+01 $(mg/kg\text{-}day)^{-1}$, to arrive at the pathway-specific cancer risk of 2.3E-08.

Soil inhalation pathway specific cancer risk	=	Soil inhalation dose (mg/kg-day)	x	CSF $(mg/kg\text{-}day)^{-1}$
2.3E-08	=	1.5E-09 (mg/kg-day)	x	1.5E+01 $(mg/kg\text{-}day)^{-1}$

All three pathway-specific cancer risk values are then added together to obtain the chemical-specific risk for arsenic of 3.4E-05.

Ingestion risk(mg/kg-d)	+	Dermal risk(mg/kg-d)	+	Inhalation risk (mg/kg-d)	=	Chemical specific risk
3.1E-05	+	3.6E-06	+	2.3E-08	=	3.4E-05

This value is then summed with all other chemical-specific risks to attain the final incremental lifetime cancer risk (ILCR) for a particular receptor in a particular medium.

ECOLOGICAL EXPOSURE DOSE EQUATIONS

The example calculations below derive the total chemical-specific risk for Arsenic in soil at Site 9. Exposure parameters for ecological receptors are available in Table 3-21, Bioaccumulation Factors for use in Modeling Food Chain Exposures for Ecological Receptors are available in Table 3-22, and Ecological Toxicity Reference Values for Indicator Receptors are available in Tables 3-32 and 3-24, where applicable.

FOOD INGESTION RATE CALCULATIONS

Food ingestion rates (FIR) for each indicator receptor were calculated using allometric equations provided in USEPA's *Wildlife Exposure Factors Handbook* (USEPA, 1993) that are based on established relationships between body size and metabolic requirements. Food ingestion rates expressed in grams of food per day were calculated based on the following equations: 3-9 for the tundra vole 3-6 for the glaucous-winged gull, and 3-7 for the cross fox.

Equation 3-6 seabirds
FIR (g/day) = 0.495 x $Wt^{0.704}$ (g)

Equation 3-7 all mammals
FIR (g/day) = 0.235 x $Wt^{0.822}$ (g) or
FIR (kg/day) = 0.0687 x $Wt^{0.822}$ (kg)

Equation 3-9 herbivores
FIR (g/day) = 0.577 x $Wt^{0.727}$ (g)

SKIN SURFACE AREA CALCULATIONS

The skin surface area (SSA) is an exposure parameter used to estimate dermal exposure of indicator receptors to soil COPECs. This parameter was calculated based on methods outlined in the *Wildlife Exposure Factors Handbook* (USEPA, 1993). Equation 3-22 was used to calculate exposure for mammals. Equation 3-21 was used to calculate exposure for birds. Exposed skin surface area was calculated assuming the area of the feet (4 percent of total skin surface area) for the tundra vole and the beak and legs (8 percent of total surface area) for the glaucous-winged gull. It was assumed that for the indicator receptors selected, fur or feathers would tend to protect other body surfaces from dermal exposure.

Equation 3-21 all birds
SSA_{skin} (cm^2) = 10 x $Wt^{0.667}$ (g)

Equation 3-22 all mammals
SSA_{skin} (m^2) = 0.11 x $Wt^{0.65}$ (kg) or
SSA_{skin} (cm^2) = 12.3 x $Wt^{0.65}$ (g)

Notes:

FIR	= Food Ingestion Rate
g/day	= Grams per day
kg/day	= Kilograms per day
Wt	= Average weight of indicator receptor
SSA_{skin}	= Surface area of the receptor

WATER INGESTION RATE CALCULATIONS

The water ingestion rate is an exposure parameter used to estimate exposure of indicator receptors to surface water COPECs. This parameter was calculated based on methods outlined in the *Wildlife Exposure Factors Handbook* (USEPA, 1993). Equation 3-17 was used to calculate exposure for mammals. Equation 3-15 was used to calculate exposure for birds.

Equation 3-15 all birds
$WI\ (L/day) = 0.059 \times Wt^{0.67}\ (kg)$

Equation 3-17 all mammals
$WI\ (L/day) = 0.099 \times Wt^{0.90}\ (kg)$

Notes:

WI	= Water Ingestion Rate
L/day	= Liters per day
kg	= Kilograms
Wt	= Average weight of indicator receptor

EXPOSURE DOSE CALCULATIONS

The initial step in calculating indicator receptor exposure doses is calculation of concentration in food items.

Average Concentrations of Chemicals of Potential Ecological Concern (COPEC) in Food Items

Food items include terrestrial plant tissues and herbivorous prey tissues. Actual concentrations in food items were used where available (i.e., plant and fish tissue sampled in site 28). For sites other than Site 28 – Drainage Basin (where plant and fish tissue concentrations were measured), estimating contaminant concentrations in plants is necessary for evaluating exposures to terrestrial indicator receptors. Estimating EPCs in plant and animal tissues were based on guidance in Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (USEPA, 1999a). The media transfer and exposure dose equations presented in USEPA (1999a) are generic in nature, and are not specific to products of combustion (e.g., oxidized chemicals). USEPA (1999a) lists a variety of chemical classes that these methods are applicable to; these chemical classes are representative of the contaminant types present at the Northeast Cape Installation.

Contaminant Concentration in Terrestrial Plant Tissues

For the ecological assessment, COPEC concentrations in terrestrial plants (C_{PLANTS}) were assumed to equal plant concentrations due to root uptake (Pr). The equation used to compute COPEC concentrations in terrestrial plants due to root uptake is:

$$C_{PLANTS} = 0.12 \times Pr$$

Where:

C_{PLANTS}	=	Total COPEC concentration in the plant (mg COPEC/kg wet tissue).
Pr	=	Concentration of COPEC in the plant due to root uptake (mg/kg dry tissue)
0.12	=	Converts from dry tissue concentration to wet tissue concentration (USEPA, 1999a)

The concentration taken up by the roots is calculated by:

$$Pr = C_{SOIL} \times BCF_{S\text{-}P}$$

Where:

Pr	=	COPEC concentration in plant due to root uptake (mg/kg tissue)
C_{SOIL}	=	COPEC concentration in soil (mg/kg dry soil)
$BCF_{S\text{-}P}$	=	Soil-to-terrestrial plant bioconcentration factor (kg dry soil/kg wet or dry tissue)

Because actual measured plant tissue concentrations were not taken at Site 9, we used the above presented equations to estimate plant concentrations.

$0.12 \times (C_{SOIL} \times BCF_{S\text{-}P}) = C_{PLANTS}$
$0.12 \times (17\ mg/kg \times 0.036) = 0.073\ mg/kg$

Contaminant Concentrations in Herbivorous Prey Tissues

The food chain model for indicator receptors considers one herbivorous prey species, the tundra vole. COPEC concentrations in herbivores depend on ingestion of abiotic media and plant matter. The equation for calculating COPEC concentrations in herbivores is:

$$C_{HERB} = (C_{PLANT} \times BCF_{TL2/TL1}) + (C_{SOIL} \times BCF_{S\text{-}H})$$

Where:

C_{HERB}	=	COPEC concentration in herbivore (mg/kg wet tissue)
C_{PLANTS}	=	Total COPEC concentration in the plant (mg COPEC/kg wet tissue)
$BCF_{TL2/TL1}$	=	Plant-to-herbivore bioconcentration factor (kg wet plant tissue/kg wet herbivore tissue)
C_{SOIL}	=	COPEC concentration in soil (mg/kg dry soil or dry sediment)
$BCF_{S\text{-}H}$	=	Bioconcentration factor for soil-to-herbivore (kg dry media/kg wet tissue)

(0.073 mg/kg x 2.0E-03 + 17 mg/kg x 2.0E-03) = 0.034 (mg/kg wet tissue)

Ingestion Dose Calculation

Exposure dose calculation consolidates exposure pathways and routes, exposure point concentrations (EPCs), and exposure parameters into an equation that provides an exposure dose estimate in units of mg/kg-day.

Ingestion dose estimates were calculated using the following general equations derived from USEPA's Wildlife Exposure Factors Handbook (USEPA, 1993):

$$Dose_{Ingestion} = \frac{[(IR_{Biotic} \times C_{Biotic}) + (IR_{Abiotic} \times EPC_{Abiotic})] \times ED \times SUF \times UC}{BW}$$

Where:

$Dose_{Ingestion}$	= Estimated exposure dose from ingestion of food and ingestion of abiotic media (mg/kg-day)
IR_{Biotic}	= Food ingestion rate (mg/day)
C_{Biotic}	= Average concentration of COPEC in food items (mg/kg)
$IR_{Abiotic}$	= Abiotic media ingestion rate (mg/day)
$EPC_{Abiotic}$	= Concentration of COPEC in abiotic media (mg/kg) (referred to as C_{SOIL} below)
ED	= Exposure duration (unitless)
SUF	= Site utilization factor (unitless)
UC	= Unit conversion 10^{-6} kg/mg
BW	= Body weight (kg)

Ingestion Dose for the Tundra Vole

$$= \frac{[(IRplant \times Cplant) + (IRsoil \times Csoil) + (IRwater \times Cwater)] \times ED \times SUF \times 10^{-6}}{(BW)}$$

$$= \frac{[(1.03E+04 \text{ mg/d} \times 0.073 \text{ mg/kg}) + (2.47E+02 \text{ mg/d} \times 17 \text{ mg/kg}) + (6.98E-03 \text{ L/d} \times 0 \text{ mg/L})] \times 1 \times 1 \times 10^{-6}}{(5.25E-02 \text{ kg})}$$

= 9.4E-02 mg/kg

Ingestion Dose for the Cross Fox

The ingestion dose equation for the Cross Fox includes modeling the concentration in the herbivore consumed by the fox. This concentration in represented by Canimal in the below presented dose equation. Canimal is calculated as follows:

$C_{animal} = C_{plant} * BCF_{TL2/TL1} + C_{soil} * BCF_{S-H}$

Where:

C_{animal} = Modeled concentration in herbivorous prey
C_{plant} = Concentration in plant
$BCF_{TL2/TL1}$ = Biomagnification factor from trophic level 1 to trophic level 2
C_{soil} = Concentration in soil
BCF_{S-H} = Bioconcentration factor from soil to herbivore

Canimal = 0.073 mg/kg x 0.002 mg tissue/kg herbivore tissue + 17 mg/kg x 0.002 mg tissue/kg herbivore tissue
= 0.034 mg/kg

$$= \frac{[(IRplant \times Cplant) + (IRanimal \times Canimal) + (IRsoil \times Csoil) + (IRwater \times Cwater)] \times ED \times SUF \times 10^{-6}}{(BW)}$$

$$= \frac{[(2.47E+05 \text{ mg/d} \times 0.073 \text{ mg/kg}) + (2.23E+05 \text{ mg/d} \times 0.034 \text{ mg/kg}) + (6.93E+03 \text{ mg/d} \times 17 \text{ mg/kg}) + (4.02E-01 \text{ L/d} \times 0 \text{ mg/L})] \times 1 \times 6.80E-03 \times 10^{-6}}{(4.75E+00 \text{ kg})}$$

= 1.8E-04 mg/kg

Ingestion Dose for the Glaucous-Winged Gull

$$= \frac{[(IRplant \times Cplant) + (IRanimal \times Cfish) + (IRsoil \times Csoil) + (IRwater \times Cwater)] \times ED \times SUF \times 10^{-6}}{(BW)}$$

$$= \frac{[(4.08E+03 \text{ mg/d} \times 0.073 \text{ mg/kg}) + (7.76E+04 \text{ mg/d} \times 0 \text{ mg/kg}) + (7.80E+03 \text{ mg/d} \times 17 \text{ mg/kg}) + (7.44E-02 \text{ L/d} \times 0 \text{ mg/L})] \times 0.5 \times 9.5E-05 \times 10^{-6}}{(1.41 \text{ kg})}$$

= 1.0E-08 mg/kg

Estimated exposure doses for each chemical and indicator receptor were compared to ecological TRVs to calculate a chemical-specific HQ and a total cumulative HI for each site. The equation for calculating HQ is:

$$HQ = \frac{Dose}{TRV}$$

Where:

HQ = Hazard quotient (unitless)
Dose = Modeled exposure dose for indicator species (mg/kg-day)
TRV = Toxicity reference value for the indicator species (mg/kg-day)

Tundra Vole:
= 9.4E-02 mg/kg = 0.019
4.9E+00 mg/kg-d

Cross Fox:
= 1.8E-04 mg/kg = 0.00064
2.8E-01 mg/kg-d

Glaucous-Winged Gull:
= 1.0E-08 mg/kg = 0.000000010
1.1E+00 mg/kg-d

HI were calculated by summing the HQs obtained from food chain modeling for all COPECs identified at Northeast Cape for each indicator receptor.

NOTES
Please note that the HQ calculations shown above include only two significant digits consistent with ADEC risk assessment policy. However actual calculations presented in Appendices F and H used more significant digits and rounding to two significant digits was not done at each step, but rather only done for presentation of the chemical-specific ecological HQ or cumulative human health HI.

TABLE D-1

DERMAL ABSORPTION FACTORS FOR CHEMICALS IN SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Compound	ABS (unitless)	Source
Inorganics		
Arsenic	0.03	a
Cadmium	0.001	a
All other inorganics	0	a
Organics		
Pentachlorophenol	0.25	a
Semivolatile organic compounds	0.10	a
All other Organic Compounds	0	a
PAHs		
Benzo(a)pyrene & other PAHs	0.13	a
PCBs		
Aroclors 1254/1242 & other PCBs	0.14	a
Dioxins & Furans		
TCDD and other dioxins	0.03	a
Pesticides		
Chlordane	0.04	a
DDT	0.03	a
Lindane	0.04	a
Petroleum Hydrocarbons		
GRO (AK101)		
GRO Aliphatic	NA [b]	
GRO Aromatic	NA [b]	
DRO (AK102)		
DRO Aliphatic	NA [b]	
DRO Aromatic	NA [b]	
RRO (AK103)		
DRO Aliphatic	NA [b]	
DRO Aromatic	NA [b]	

Notes:

[a] Exhibit 3-4 from USEPA, 2001a. Risk Assessment Guidance for Superfund Voluem I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. Review Draft. September.

[b] Potential dermal exposures to DRO, GRO and RRO were not quantified in the HHRA due to uncertainties in route-to-route extrapolation methods (refer to Section 3.1.2.3.3).
ABS - Dermal absorption factor.

DERMAL ABSORPTION FACTORS FOR CHEMICALS IN SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Compound	ABS (unitless)	Source

DRO - Diesel range organics.
DDT - Dichlorodiphenyltrichloroethane.
GRO - Gasoline range organics.
NA - Not applicable.
PAHs - Polynuclear aromatic hydrocarbons.
PCBs - Polychlorinated biphenyls.
RRO - Residual range organics.
TCDD - Tetrachlorodibenzo-p-dioxin.

TABLE D-2

PERMEABILITY COEFFICIENTS AND VOLATILITY FACTORS FOR COPCs IN WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Compound	Volatility Factor (m^3/L) [a]	Permeabiltiy Coefficient (Kp) (cm/hr)	Kp Source
Inorganics			
Cadmium	NA	1.0E-03	b
Chromium VI	NA	2.0E-03	b
Cobalt	NA	4.0E-04	b
Lead	NA	1.0E-04	b
Mercury	NA	1.0E-03	b
Nickel	NA	2.0E-04	b
Potassium	NA	2.0E-03	b
Silver	NA	6.0E-04	b
Zinc Chloride	NA	6.0E-04	b
All other inorganics	NA	1.0E-03	b
Volatile Organic Compounds			
4-Isopropyltoluene	2.5E-03 [c]	1.2E-01	b
Benzene	1.2E-03	2.1E-02	b
Ethylbenzene	1.8E-03	7.4E-02	b
Methylene Chloride	4.8E-04	4.5E-03	b
n-Propylbenzene (Isocumene)	2.9E-03	3.1E-01	b
sec-Butylbenzene	4.1E-03 [d]	8.0E-02	b
Toluene	1.4E-03	4.5E-02	b
Trichloroethylene (TCE)	2.3E-03	1.6E-02	b
Semivolatile Organic Compounds	na	na	
bis(2-ethylexyl)phthalate (DEHP)	5.9E-08	2.5E-02	b
Polychlorinated Biphenyls			
Aroclor 1260	na	4.3E-01	b
Polynuclear Aromatic Hydrocarbons			
Naphthalene	NA	6.9E-02	b
Pesticides	NA	na	
Dioxins & Furans			
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	NA	8.1E-01	b
Petroleum Hydrocarbons			
GRO (AK101)	1.9E-03		
GRO Aliphatic	NA	Inc	
GRO Aromatic	NA	Inc	
DRO (AK102)	9.6E-05		
DRO Aliphatic	NA	Inc	
DRO Aromatic	NA	Inc	
RRO (AK103)	1.0E-07		
DRO Aliphatic	NA	Inc	
DRO Aromatic	NA	Inc	

TABLE D-2

PERMEABILITY COEFFICIENTS AND VOLATILITY FACTORS FOR COPCs IN WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Compound	Volatility Factor (m^3/L) [a]	Permeabiltiy Coefficient (Kp) (cm/hr)	Kp Source

Notes:
cm/hr - Centimeters per hour.
DRO - Diesel range organics.
GRO - Gasoline range organics.
Kp - Permeability coefficient.
m^3/L - Cubic meters per liter.
na - Not available.
NA - Not applicable.
RRO - Residual range organics.
[a] Calculated based on the methods of Andelman (1990).
[b] Calculated with Equation 3.8 from USEPA, 2001. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. Review Draft - For Public Comment. September, 2001.
[c] Isopropylbenzene was used as a surrogate, based on similarities in chemical structure.
[d] Butylbenzene was used as a surrogate based on similar chemical structure.

APPENDIX E

Human Health Tier 1 Screening Tables

Table E-1
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 3
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics										
Chromium	12	9.8	2	2	1.0	48	50	26	2.6	No
Copper	22	9	2	2	1.0	107	44	4,060	406	No
Lead	119	27	3	3	1.0	106	112	400 [d]	40	Yes
Nickel	16	8	2	2	1.0	59	30	87	8.7	No
Zinc	118	35	2	2	1.0	615	157	9,100	910	No
VOCs										
Methylene chloride	0.0093	0.0093	1	1	1.0	nc	nc	0.015	0.0015	Yes
PCBs										
PCB-1260 (Aroclor 1260)	0.75	0.29	2	2	1.0	nc	nc	10	1	No
PAHs										
Anthracene	10.29	10.29	3	1	0.3	nc	nc	4,300	430	No
Naphthalene	50.8	50.8	4	1	0.3	nc	nc	21	2.1	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3,760	314	6	5	0.8	nc	nc	250	25	Yes
TRPH	6,550	393	3	3	1.0	nc	nc	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

Table E-1
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 3
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:
1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-2
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 3
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data					Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Maximum Detect (mg/L)	Minimum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
VOCs										
Ethylbenzene	0.066	0.066	1	1	1.0	nc	nc	0.7	0.07	No
Xylenes	0.54	0.54	1	1	1	nc	nc	10	1	No
PAHs										
Fluorene	0.0012	0.0012	1	1	1.0	nc	nc	1.46	0.146	No
Naphthalene	0.013	0.013	1	1	1.0	nc	nc	1.46	0.146	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	14	1.8	4	4	1.0	nc	nc	1.5	0.15	Yes
Residual Range Organics (RRO)	8.1	1.3	3	3	1.0	nc	nc	1.1	0.11	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

na - Not available.

nc - Not calculated.

PAH - Polynuclear Aromatic Hydrocarbons

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-3
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 4
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Lead	160	7.4	2	2	1.0	na	na	na	na	na	106	112	400 [d]	40	Yes
PAHs															
Anthracene	na	na	na	na	na	14	14	1	1	1.0	nc	nc	4,300	430	No
Chrysene	na	na	na	na	na	11	11	1	1	1.0	nc	nc	620	62	No
Fluorene	na	na	na	na	na	13	13	1	1	1.0	nc	nc	270	27	No
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	5,300	150	3	3	1.0	459	459	1	1	1.0	nc	nc	250	25	Yes
Residual Range Organics (RRO)	na	na	na	na	na	3,420	3,420	1	1	1.0	nc	nc	10,000	1,000	Yes
TRPH	47,000	690	3	3	1.0	na	na	na	na	na	nc	nc	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:
1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-4
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 4
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data									
			Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
VOCs										
Xylenes	0.0069	0.0069	1	1	1.0	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3.7	0.96	4	4	1.0	nc	nc	1.5	0.15	Yes
Residual Range Organics (RRO)	6.5	2.6	3	3	1.0	nc	nc	1.1	0.11	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liters.

na - Not available.

nc - Not calculated.

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-5
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Aluminum	9,850	9,850	1	1	1.0	7,790	7,790	1	1	1.0	30,357	nc	na	na	Yes
Arsenic	4.1	4.1	1	1	1.0	1.6	1.6	1	1	1.0	7.8	11	2	0.2	No
Barium	53.8	53.8	1	1	1.0	53	53	1	1	1.0	174	nc	1,100	110	No
Beryllium	0.8	0.8	4	1	0.25	1.3	0.6	9	2	0.22	3.8	nc	42	4.2	Yes
Calcium	2,360	2,360	1	1	1.0	1,790	1,790	1	1	1.0	nc	nc	NA [f]	NA	No
Chromium	20	13.9	4	3	0.75	18	6	9	9	1.0	48	50	26	2.6	No
Cobalt	5.1	5.1	1	1	1.0	2	2	1	1	1.0	49	nc	na	na	Yes
Copper	23	8	4	4	1.0	17	7.4	9	9	1.0	107	44	4,060	406	No
Iron	16,400	16,400	1	1	1.0	12,200	12,200	1	1	1.0	nc	nc	NA [f]	NA	No
Lead	34	13	4	4	1.0	71	8	9	9	1.0	106	112	400 [d]	40	No
Magnesium	2,900	2,900	1	1	1.0	1,530	1,530	1	1	1.0	nc	nc	NA [f]	NA	No
Manganese	164	164	1	1	1.0	72.7	72.7	1	1	1.0	1,589	nc	na	na	Yes
Nickel	15	9	4	3	0.75	10	5	9	9	1.0	59	30	87	8.7	No
Potassium	820	820	1	1	1.0	1,500	1,500	1	1	1.0	nc	nc	NA [f]	NA	No
Sodium	160	160	1	1	1.0	450	450	1	1	1.0	nc	nc	NA [f]	NA	No
Vanadium	25.8	25.8	1	1	1.0	16	16	1	1	1.0	73	nc	710	71	No
Zinc	93	29.8	4	4	1.0	172	20	9	9	1.0	615	157	9,100	910	No
VOCs															
Ethylbenzene	0.00088	0.00088	5	1	0.20	0.012	0.012	9	1	0.11	na	na	5.5	0.55	No
m,p-Xylene	0.0033	0.0033	2	1	0.50	0.044	0.044	3	1	0.33	na	na	na	na	Yes
Methylene chloride	0.0076	0.0076	1	1	1.0	0.0079	0.0044	2	2	1.0	na	na	0.015	0.0015	Yes
o-Xylene	0.001	0.001	2	1	0.50	0.014	0.014	3	1	0.33	na	na	na	na	Yes
Toluene	0.0047	0.0047	5	1	0.20	0.078	0.0052	9	3	0.33	na	na	5.4	0.54	No
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	4,660	34	4	4	1.0	102,000	12	13	13	1.0	na	na	250	25	Yes
Residual Range Organics (RRO)	370	220	1	1	1.0	8,500	880	5	5	1.0	na	na	10,000	1,000	Yes
TRPH	19,200	31	3	3	1.0	262,000	67	8	8	1.0	na	na	NA [e]	NA	No

Notes:
NA - Not available.
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

Table E-5
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

[f] This analyte is excluded as a COPC due to status as an essential nutrient.

Table E-6
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Minimum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Aluminum	78.3	78.3	1	1	1.0	nc	nc	na	na	Yes
Arsenic	0.022	0.022	1	1	1.0	0.025	nc	0.05	0.005	No
Barium	0.406	0.406	1	1	1.0	nc	nc	2	0.2	Yes
Beryllium	0.02	0.004	2	2	1.0	0.021	nc	0.004	0.0004	No
Cadmium	0.006	0.006	2	1	0.5	0.060	nc	0.005	0.0005	No
Calcium	15.8	15.8	1	1	1.0	nc	nc	NA [e]	NA	No
Chromium	1.22	0.37	2	2	1.0	1.7	nc	0.1	0.01	No
Cobalt	0.052	0.052	1	1	1.0	0.011	nc	na	na	Yes
Copper	0.27	0.26	2	2	1.0	0.087	nc	1.3	0.13	Yes
Iron	98.8	98.8	1	1	1.0	nc	nc	NA [e]	NA	No
Lead	0.23	0.16	2	2	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Magnesium	15.6	15.6	1	1	1.0	nc	nc	NA [e]	NA	No
Manganese	1.58	1.58	1	1	1.0	0.20	nc	na	na	Yes
Mercury	0.0001	0.0001	1	1	1.0	0.00041	nc	0.002	0.0002	No
Nickel	1.68	0.23	2	2	1.0	0.056	nc	0.1	0.01	Yes
Potassium	7.92	7.92	1	1	1.0	nc	nc	NA [e]	NA	No
Sodium	17.7	17.7	1	1	1.0	nc	nc	NA [e]	NA	No
Thallium	0.002	0.002	2	1	0.5	nc	nc	0.002	0.0002	Yes
Vanadium	0.153	0.153	1	1	1.0	0.10	nc	0.26	0.026	Yes
Zinc	17.7	0.8	2	2	1.0	0.29	nc	11	1.1	Yes
Inorganics, Dissolved										
Lead, Dissolved	0.002	0.002	1	1	1.0	nc	nc	0.015	0.0015	Yes
VOCs										
2-Butanone	0.017	0.017	2	1	0.50	na	na	22	2.2	No
Acetone	0.035	0.0053	2	2	1.0	na	na	3.65	0.365	No
Benzene	0.0035	0.0035	3	1	0.33	na	na	0.005	0.0005	Yes
Toluene	0.0074	0.0074	3	1	0.33	na	na	1.0	0.1	No
Petroleum Hydrocarbons										

Table E-6
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
Diesel Range Organics (DRO)	1.7	0.27	4	3	0.75	na	na	1.5	0.15	Yes
Gasoline Range Organics (GRO)	0.08	0.08	3	1	0.33	na	na	1.3	0.13	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

Table E-7
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics										
Aluminum	12,000	3,640	5	5	1.0	30,357	nc	na	na	Yes
Arsenic	50	2.0	18	18	1.0	7.8	11	2	0.2	Yes
Barium	135	28	5	5	1.0	174	nc	1,100	110	No
Beryllium	2.3	0.40	19	8	0.42	3.8	nc	42	4.2	No
Cadmium	4.1	1.0	19	9	0.47	1.4	3.1	5	0.5	Yes
Calcium	5,070	1,780	5	5	1.0	nc	nc	NA [e]	NA	No
Chromium	100	5.0	19	18	0.95	48	50	26	2.6	Yes
Cobalt	19	2.0	5	5	1.0	49	nc	na	na	Yes
Copper	320	6.6	19	19	1.0	107	44	4,060	406	No
Iron	152,000	8,380	5	5	1.0	nc	nc	NA [e]	NA	No
Lead	460	10	20	20	1.0	106	112	400 [d]	40	Yes
Magnesium	3,180	740	5	5	1.0	nc	nc	NA [e]	NA	No
Manganese	694	55.3	5	5	1.0	1,589	nc	na	na	Yes
Mercury	0.56	0.10	18	4	0.22	0.43	nc	1.4	0.14	Yes
Nickel	280	5.0	19	16	0.84	59	30	87	8.7	Yes
Potassium	1,080	370	5	5	1.0	nc	nc	NA [e]	NA	No
Silver	2.0	2.0	19	2	0.11	nc	nc	21	2.1	No
Sodium	210	120	5	5	1.0	nc	nc	NA [e]	NA	No
Thallium	1.2	0.28	2	2	1.0	1.6	0.56	na	na	Yes
Vanadium	31	9.8	5	5	1.0	73	nc	710	71	No
Zinc	540	29	19	19	1.0	615	157	9,100	910	No
VOCs										
1,1,1-Trichloroethane	0.28	0.14	10	3	0.30	na	na	1	0.1	Yes
Acetone	1.4	0.048	10	4	0.40	na	na	10	1	Yes
Bromoethane	0.4	0.098	10	5	0.50	na	na	na	na	Yes
m,p-Xylene	0.13	0.13	10	1	0.10	na	na	na	na	Yes

Table E-7
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Methylene chloride	0.013	0.0065	9	4	0.44	na	na	0.015	0.0015	Yes
Toluene	0.14	0.026	19	3	0.16	na	na	5.4	0.54	No
SVOCs										
4-Methylphenol (p-Cresol)	3.9	1.7	14	3	0.21	na	na	na	na	Yes
Di-n-butyl phthalate	3.0	3.0	14	1	0.07	na	na	1700	170	No
PCBs										
PCB-1260 (Aroclor 1260)	13	0.13	22	4	0.18	na	na	10	1	Yes
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0.0000011	13	4	0.31	na	na	na	na	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0.00000091	13	12	0.92	na	na	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0.00000043	12	4	0.33	na	na	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0.00000047	13	8	0.62	na	na	na	na	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0000013	0.0000013	13	1	0.08	na	na	na	na	Yes
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000027	0.00000012	13	4	0.31	na	na	na	na	Yes
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0000020	0.0000020	13	1	0.08	na	na	na	na	Yes
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0.000011	13	1	0.08	na	na	na	na	Yes
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000046	0.00000019	13	4	0.31	na	na	na	na	Yes
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000040	0.00000040	13	1	0.08	na	na	na	na	Yes
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.000031	0.0000051	13	2	0.15	na	na	na	na	Yes
1,2,3,7,8-Pentachlorodibenzofuran	0.0000045	0.0000045	13	1	0.08	na	na	na	na	Yes
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0000015	0.0000015	13	1	0.08	na	na	na	na	Yes
2,3,4,6,7,8-Hexachlorodibenzofuran	0.000019	0.00000041	13	8	0.62	na	na	na	na	Yes
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0.000012	13	1	0.08	na	na	na	na	Yes
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0.00000028	13	6	0.46	na	na	na	na	Yes
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0.00053	3	1	0.33	na	na	na	na	Yes
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0.000095	3	2	0.67	na	na	na	na	Yes

Table E-7
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0.00019	3	1	0.33	na	na	na	na	Yes
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0.00034	3	1	0.33	na	na	na	na	Yes
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0.00011	3	1	0.33	na	na	na	na	Yes
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0.00015	3	1	0.33	na	na	na	na	Yes
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0.000039	3	1	0.33	na	na	na	na	Yes
PAHs										
2-Methylnaphthalene	0.047	0.047	19	1	0.053	na	na	43	4.3	No
Benzo(a)pyrene	0.082	0.082	19	1	0.053	na	na	1	0.1	No
Benzo(b)fluoranthene	0.014	0.014	19	1	0.053	na	na	11	1.1	No
Benzo(k)fluoranthene	0.014	0.014	19	1	0.053	na	na	110	11	No
Chrysene	0.035	0.013	19	2	0.11	na	na	620	62	No
Naphthalene	0.027	0.027	20	1	0.050	na	na	21	2.1	No
Phenanthrene	0.014	0.014	19	1	0.053	na	na	4,300	430	No
Pyrene	0.026	0.013	19	2	0.11	na	na	1,500	150	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	32,000	11	24	21	0.88	na	na	250	25	Yes
Residual Range Organics (RRO)	3,900	620	7	7	1.0	na	na	10,000	1,000	Yes
TRPH	156,000	18	14	14	1.0	na	na	NA [f]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table E-7
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] This analyte is excluded as a COPC due to status as an essential nutrient.

[f] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-8
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 7
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Shallow Subsurface Water Data: Maximum Detect (mg/L)	Shallow Subsurface Water Data: Maximum Detect (mg/L)	Shallow Subsurface Water Data: Number of Samples	Shallow Subsurface Water Data: Number of Detects	Shallow Subsurface Water Data: Detection Frequency	Subsurface Water BUTL (mg/L) [a]: Shallow	Subsurface Water BUTL (mg/L) [a]: Deep	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Aluminum	26	11	3	3	1.0	nc	nc	na	na	Yes
Arsenic	0.010	0.0040	4	3	0.75	0.025	nc	0.05	0.005	No
Barium	0.13	0.13	3	3	1.0	nc	nc	2	0.2	Yes
Beryllium	0.0020	0.0020	4	1	0.25	0.021	nc	0.004	0.0004	No
Calcium	7.6	4.0	3	3	1.0	nc	nc	NA [e]	NA	No
Chromium	0.26	0.014	4	3	0.75	1.7	nc	0.1	0.01	No
Cobalt	0.064	0.0040	3	3	1.0	0.011	nc	na	na	Yes
Copper	0.067	0.011	4	3	0.75	0.087	nc	1.3	0.13	No
Iron	47	11	3	3	1.0	nc	nc	NA [e]	NA	No
Lead	0.040	0.005	4	4	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Magnesium	3.8	3.6	3	3	1.0	nc	nc	NA [e]	NA	No
Manganese	0.59	0.060	3	3	1.0	0.20	nc	na	na	Yes
Mercury	0.00020	0.00020	4	2	0.50	0.00041	nc	0.002	0.0002	No
Nickel	3.5	3.5	4	1	0.25	0.056	nc	0.1	0.01	Yes
Potassium	5.3	1.6	3	3	1.0	nc	nc	NA [e]	NA	No
Sodium	13	8.5	3	3	1.0	nc	nc	NA [e]	NA	No
Vanadium	0.079	0.029	3	3	1.0	0.10	nc	0.26	0.026	No
Zinc	2.5	0.020	4	3	0.75	0.29	nc	11	1.1	Yes
VOCs										
2-Butanone	0.013	0.013	4	1	0.25	nc	nc	22	2.2	No
Acetone	0.028	0.019	4	2	0.50	nc	nc	3.65	0.365	No
Benzene	0.0021	0.0021	5	1	0.20	nc	nc	0.005	0.0005	Yes
SVOCs										
Benzoic acid	0.021	0.021	1	1	1.0	nc	nc	146	14.6	No
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.00000023	0.00000023	1	1	1.0	nc	nc	na	na	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	0.66	0.39	4	3	0.75	nc	nc	1.5	0.15	Yes

Table E-8
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/kg) (mg/L)	(mg/L)	(Yes/No)
Residual Range Organics (RRO)	2.7	1.1	3	3	1.0	nc	nc	1.1	0.11	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liters.

NA - Not applicable.

na - Not available.

nc - Not calculated.

SVOC - Semivolatile Organic Compounds

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

e This analyte is excluded as a COPC due to status as an essential nutrient.

Table E-9
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Aluminum	0.0000036	0.0000036	5	1	0.20	30,357	nc	na	na	Yes
Antimony	14	14	15	1	0.067	nc	nc	3.6	0.36	Yes
Arsenic	20	3.6	15	7	0.47	7.8	11	2	0.2	Yes
Beryllium	3.55	0.70	15	5	0.33	3.8	nc	42	4.2	No
Cadmium	7.0	0.75	15	4	0.27	1.4	3.1	5	0.5	Yes
Calcium	4,940	1,910	5	5	1.0	nc	nc	NA [e]	NA	No
Chromium	60	5.0	15	14	0.93	48	50	26	2.6	Yes
Cobalt	38	4.0	5	4	0.80	49	nc	na	na	Yes
Copper	429	6.0	15	15	1.0	107	44	4,060	406	Yes
Iron	483,000	13,000	5	5	1.0	nc	nc	NA [e]	NA	No
Lead	630	20	15	14	0.93	106	112	400 [d]	40	Yes
Magnesium	3,220	930	5	5	1.0	nc	nc	NA [e]	NA	No
Manganese	970	51	5	5	1.0	1,589	nc	na	na	Yes
Mercury	0.60	0.60	15	1	0.07	0.43	nc	1.4	0.14	Yes
Nickel	110	7.7	15	11	0.73	59	30	87	8.7	Yes
Potassium	1,060	650	5	4	0.80	nc	nc	NA [e]	NA	No
Selenium	1.0	1.0	15	1	0.07	nc	nc	3.5	0.35	Yes
Sodium	280	180	5	5	1.0	nc	nc	NA [e]	NA	No
Thallium	0.28	0.28	2	1	0.50	1.6	0.56	na	na	Yes
Vanadium	44	21	5	4	0.80	73	nc	710	71	No
Zinc	1,790	15	15	15	1.0	615	157	9,100	910	Yes
VOCs										
1,1,1-Trichloroethane	0.20	0.20	8	1	0.13	nc	nc	1	0.1	Yes
1,2,4-Trichlorobenzene	0.00018	0.000040	15	3	0.20	nc	nc	2	0.2	No
1,2-Dibromoethane	0.000010	0.0000097	8	2	0.25	nc	nc	na	na	Yes
1,2-Dichlorobenzene	0.025	0.0000016	15	7	0.47	nc	nc	7	0.7	No

Table E-9
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
1,2-Dichloroethane	0.00079	0.000014	8	5	0.63	nc	nc	0.015	0.0015	No
1,2-Dichloropropane	0.00040	0.0000070	8	4	0.50	nc	nc	0.017	0.0017	No
1,3,5-Trimethylbenzene	0.00018	0.0000013	8	5	0.63	nc	nc	25	2.5	No
1,3-Dichlorobenzene	0.068	0.00000025	15	7	0.47	nc	nc	0.26	0.026	Yes
1,3-Dichloropropane	0.000097	0.00000059	8	5	0.63	nc	nc	na	na	Yes
1,4-Dichlorobenzene	0.025	0.000014	15	3	0.20	nc	nc	0.8	0.08	No
2,2-Dichloropropane	0.00000092	0.00000092	8	1	0.13	nc	nc	na	na	Yes
2-Butanone	0.0000045	0.00000059	8	2	0.25	nc	nc	60	6	No
2-Chloroethyl vinyl ether	0.0000026	0.00000054	5	2	0.40	nc	nc	na	na	Yes
2-Chlorotoluene	0.0000045	0.0000013	8	2	0.25	nc	nc	na	na	Yes
2-Hexanone	0.0000087	0.0000078	5	2	0.40	nc	nc	na	na	Yes
4-Bromophenyl phenyl ether	0.0000024	0.0000012	10	2	0.20	nc	nc	na	na	Yes
4-Chlorophenyl phenyl ether	0.0000029	0.00000064	10	2	0.20	na	na	na	na	Yes
4-Isopropyltoluene	0.0000047	0.00000077	8	3	0.38	nc	nc	na	na	Yes
Acetone	0.000013	0.0000048	8	2	0.25	nc	nc	10	1	No
Bromomethane	0.36	0.36	8	1	0.13	nc	nc	na	na	Yes
Styrene	0.014	0.014	8	1	0.13	nc	nc	1.3	0.13	No
Toluene	6	0.23	16	2	0.13	nc	nc	5.4	0.54	Yes
2,4,5-Trichlorophenol	0.0000032	0.0000032	10	1	0.10	nc	nc	90	9	No
2,4,6-Trichlorophenol	0.0000025	0.0000011	10	2	0.20	nc	nc	0.6	0.06	No
2,4-Dichlorophenol	0.0000015	0.00000034	10	2	0.20	nc	nc	0.45	0.045	No
2,4-Dimethylphenol	0.0000014	0.0000014	10	1	0.10	nc	nc	4	0.4	No
2,4-Dinitrophenol	0.0000016	0.0000016	10	1	0.10	nc	nc	0.2	0.02	No
2,4-Dinitrotoluene	0.0000016	0.0000016	10	1	0.10	nc	nc	0.005	0.0005	No
2,6-Dinitrotoluene	0.0000016	0.0000016	10	1	0.10	nc	nc	0.0044	0.00044	No
2-Methyl-4,6-dinitrophenol	0.0000037	0.00000022	10	3	0.30	nc	nc	na	na	Yes
2-Methylphenol (o-Cresol)	0.00000035	0.00000035	10	1	0.10	nc	nc	7	0.7	No
3,3-Dichlorobenzidine	0.00000068	0.00000068	10	1	0.10	nc	nc	0.02	0.002	No
3-Nitroaniline	0.0000019	0.00000080	10	2	0.20	nc	nc	na	na	Yes

Table E-9
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
4-Chloroaniline	0.0000026	0.00000061	10	2	0.20	nc	nc	0.5	0.05	No
4-Chlorotoluene	0.025	0.00000043	8	4	0.50	nc	nc	na	na	Yes
4-Nitroaniline	0.000030	0.000030	10	1	0.10	nc	nc	na	na	Yes
4-Nitrophenol	0.00013	0.0000088	10	3	0.30	nc	nc	na	na	Yes
bis-(2-ethylhexyl)phthalate	1.0	1.0	10	1	0.10	nc	nc	590	59	No
PCBs										
PCB-1260 (Aroclor 1260)	0.13	0.13	15	1	0.067	nc	nc	10	1	No
Pesticides										
4,4'-DDD	0.0000019	0.0000019	10	1	0.10	nc	nc	35	3.5	No
4,4'-DDE	0.0000016	0.0000016	10	1	0.10	nc	nc	24	2.4	No
4,4'-DDT	0.00000054	0.00000017	10	3	0.30	nc	nc	24	2.4	No
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00012	0.0000038	10	6	0.60	nc	nc	na	na	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0011	0.0000070	10	9	0.90	nc	nc	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000030	0.00000025	10	7	0.70	nc	nc	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00012	0.00000059	10	8	0.80	nc	nc	na	na	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0000023	0.0000023	9	1	0.11	nc	nc	na	na	Yes
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0000066	0.00000023	10	4	0.40	nc	nc	na	na	Yes
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0000029	0.0000011	10	4	0.40	nc	nc	na	na	Yes
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0000016	0.0000014	10	2	0.20	nc	nc	na	na	Yes
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0000045	0.00000059	9	2	0.22	nc	nc	na	na	Yes
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000038	0.00000038	10	1	0.10	nc	nc	na	na	Yes
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000083	0.0000012	10	4	0.40	nc	nc	na	na	Yes
1,2,3,7,8-Pentachlorodibenzofuran	0.0000021	0.00000022	10	3	0.30	nc	nc	na	na	Yes
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00000035	0.00000035	9	1	0.11	nc	nc	na	na	Yes
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000032	0.00000080	10	4	0.40	nc	nc	na	na	Yes

Table E-9
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
2,3,4,7,8-Pentachlorodibenzofuran	0.0000025	0.00000033	10	3	0.30	nc	nc	na	na	Yes
2,3,7,8-Tetrachlorodibenzofuran	0.0000066	0.00000026	10	7	0.70	nc	nc	na	na	Yes
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000017	0.00000028	10	3	0.30	nc	nc	na	na	Yes
Total Heptachlorodibenzofurans (HpCDF)	0.000095	0.000095	3	1	0.33	nc	nc	na	na	Yes
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.00018	0.000040	3	2	0.67	nc	nc	na	na	Yes
Total Tetrachlorodibenzofurans (TCDF)	0.00001	0.0000097	3	2	0.67	nc	nc	na	na	Yes
PAHs										
2-Methylnaphthalene	0.0000021	0.0000011	16	2	0.13	nc	nc	43	4.3	No
Acenaphthene	0.000029	0.00000088	16	8	0.50	nc	nc	210	21	No
Acenaphthylene	0.000055	0.00000099	16	7	0.44	nc	nc	210	21	No
Anthracene	0.0092	0.0092	16	1	0.063	nc	nc	4,300	430	No
Benzo(k)fluoranthene	0.057	0.057	16	1	0.063	nc	nc	110	11	No
Chrysene	0.064	0.064	16	1	0.063	nc	nc	620	62	No
Fluoranthene	0.023	0.023	16	1	0.063	nc	nc	2,100	210	No
Indeno(1,2,3-cd)pyrene	0.018	0.018	16	1	0.063	nc	nc	11	1.1	No
Phenanthrene	0.024	0.024	16	1	0.063	nc	nc	4,300	430	No
Pyrene	0.041	0.041	16	1	0.063	nc	nc	1,500	150	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	510	8.9	16	16	1.0	nc	nc	250	25	Yes
Residual Range Organics (RRO)	2,100	53	6	6	1.0	nc	nc	10,000	1,000	Yes
TRPH	5,260	169	10	10	1.0	nc	nc	na [f]	na	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern

Table E-9
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] This analyte is excluded as a COPC due to status as an essential nutrient.

[f] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-10
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Minimum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Aluminum	164	49	2	2	1.0	nc	nc	na	na	Yes
Antimony	0.12	0.12	5	1	0.20	nc	nc	0.006	0.0006	Yes
Arsenic	0.025	0.0060	5	4	0.80	0.025	nc	0.05	0.005	No
Barium	1.2	0.27	2	2	1.0	nc	nc	2	0.2	Yes
Beryllium	0.014	0.0040	5	2	0.40	0.021	nc	0.004	0.0004	No
Cadmium	0.0040	0.0020	5	2	0.40	0.060	nc	0.005	0.0005	No
Calcium	59	8.0	2	2	1.0	nc	nc	NA [e]	NA	No
Chromium	0.099	0.030	5	4	0.80	1.7	nc	0.1	0.01	No
Cobalt	0.037	0.012	2	2	1.0	0.011	nc	na	na	Yes
Copper	0.068	0.030	5	4	0.80	0.087	nc	1.3	0.13	No
Iron	322	77	2	2	1.0	nc	nc	NA [e]	NA	No
Lead	0.30	0.019	5	5	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Magnesium	39	8.6	2	2	1.0	nc	nc	NA [e]	NA	No
Manganese	2.2	0.33	2	2	1.0	0.20	nc	na	na	Yes
Mercury	0.00040	0.00020	5	2	0.40	0.00041	nc	0.002	0.0002	No
Nickel	0.11	0.080	5	2	0.40	0.056	nc	0.1	0.01	Yes
Potassium	16	3.0	2	2	1.0	nc	nc	NA [e]	NA	No
Sodium	47	9.1	2	2	1.0	nc	nc	NA [e]	NA	No
Vanadium	0.15	0.097	2	2	1.0	0.10	nc	0.26	0.026	Yes
Zinc	0.51	0.090	5	4	0.80	0.29	nc	11	1.1	No
VOCs										
2-Butanone	0.0096	0.0069	5	3	0.60	nc	nc	22	2.2	No
Acetone	0.017	0.011	5	3	0.60	nc	nc	3.65	0.365	No
Benzene	0.0012	0.0012	8	1	0.13	nc	nc	0.005	0.0005	Yes
m,p-Xylene	0.0019	0.0019	5	1	0.20	nc	nc	10	1.0	No
Toluene	0.0014	0.0012	8	2	0.25	nc	nc	1.0	0.1	No
SVOCs										

Table E-10
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Minimum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Benzoic acid	0.18	0.040	3	2	0.67	nc	nc	146	14.6	No
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.000000060	0.000000044	2	2	1.0	nc	nc	na	na	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0000010	0.00000033	2	2	1.0	nc	nc	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000000037	0.000000037	2	1	0.50	nc	nc	na	na	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00000013	0.000000048	2	2	1.0	nc	nc	na	na	Yes
2,3,7,8-Tetrachlorodibenzofuran	0.000000036	0.000000036	2	1	0.50	nc	nc	na	na	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	7.7	0.51	6	5	0.83	nc	nc	1.5	0.15	Yes
Gasoline Range Organics (GRO)	4.2	4.2	2	1	0.50	nc	nc	1.1	0.11	Yes
TRPH	2.2	2.2	3	1	0.33	nc	nc	NA [f]	NA	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

SVOC - Semivolatile Organic Compounds

VOC - Volatile Organic Compounds

TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.

Table E-10
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Minimum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)

ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

e This analyte is excluded as a COPC due to status as an essential nutrient.

f TRPH is excluded as a COPC due to outdated analysis methods.

Table E-11
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 10
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Cadmium	2.0	1.7	5	3	0.60	1.4	3.1	5	0.5	No
Chromium	18	8.4	5	5	1.0	48	50	26	2.6	No
Copper	35	14	5	5	1.0	107	44	4,060	406	No
Lead	84	30	5	5	1.0	106	112	400 [d]	40	No
Nickel	12	5.1	5	5	1.0	59	30	87	8.7	No
Thallium	0.34	0.34	1	1	1.0	1.6	0.56	na	na	Yes
Zinc	183	47	5	5	1.0	615	157	9,100	910	No
VOCs										
Toluene	0.0032	0.0032	6	1	0.17	na	na	5.4	0.54	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	26,500	59	11	11	1.0	na	na	250	25	Yes
Diesel Range Organics_ Aromatic	38	38	1	1	1.0	na	na	100	10	Yes
Diesel Range Organics_Aliphatic	340	340	1	1	1.0	na	na	7,200	720	No
Residual Range Organics (RRO)	980	980	1	1	1.0	na	na	10,000	1,000	No
Residual Range Organics_Aromatic	160	160	1	1	1.0	na	na	3,000	300	No
TRPH	119,000	130	11	11	1.0	na	na	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

Table E-11
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 10
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-12
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 11
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Cadmium	2.1	2.1	3	1	0.33	1.4	3.1	5	0.5	No
Chromium	19	18	3	3	1.0	48	50	26	2.6	No
Copper	24	15	3	3	1.0	107	44	4,060	406	No
Lead	67	26	3	3	1.0	106	112	400 [d]	40	No
Nickel	12	10	3	3	1.0	59	30	87	8.7	No
Zinc	61	49	3	3	1.0	615	157	9,100	910	No
VOCs										
Ethylbenzene	0.85	0.85	9	1	0.11	na	na	5.5	0.55	Yes
Xylenes	3.0	3.0	9	1	0.11	na	na	78	7.8	No
PCBs										
PCB-1254 (Aroclor 1254)	0.79	0.32	3	2	0.67	na	na	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	69,100	11	9	9	1.0	na	na	250	25	Yes
Gasoline Range Organics (GRO)	192	192	9	1	0.11	na	na	300	30	Yes
TRPH	32,100	76	9	9	1.0	na	na	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table E-12
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 11
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

[f] This analyte is excluded as a COPC due to status as an essential nutrient.

Table E-13
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 11
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
VOCs										
1,3,5-Trimethylbenzene	0.031	0.031	2	1	0.50	nc	nc	1.85	0.185	No
Benzene	0.010	0.010	4	1	0.25	nc	nc	0.005	0.0005	Yes
Ethylbenzene	0.070	0.070	4	1	0.25	nc	nc	0.7	0.07	No
Isopropylbenzene	0.014	0.014	2	1	0.50	nc	nc	3.65	0.365	No
m,p-Xylene	0.060	0.060	2	1	0.50	nc	nc	10	1	No
Methylene chloride	0.011	0.011	2	1	0.50	nc	nc	0.005	0.0005	Yes
n-Propylbenzene	0.016	0.016	2	1	0.50	nc	nc	na	na	Yes
Toluene	0.0065	0.0065	4	1	0.25	nc	nc	1	0.1	No
Xylenes	0.015	0.015	2	1	0.50	nc	nc	10	1	No
PAHs										
Naphthalene	0.39	0.39	2	1	0.50	nc	nc	1.46	0.146	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	45	0.34	4	4	1.0	nc	nc	1.5	0.15	Yes
Gasoline Range Organics (GRO)	1.1	1.1	2	1	0.50	nc	nc	1.3	0.13	Yes
TRPH	6.6	6.6	2	1	0.50	nc	nc	NA [d]	NA	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

PAH - Polynuclear Aromatic Hydrocarbons

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

Table E-13
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 11
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data					Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

d TRPH is excluded as a COPC due to outdated analysis methods.

Table E-14
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 13
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Chromium	42	4.5	14	14	1.00	48	50	26	2.6	No
Lead	62	4.7	24	24	1.0	106	112	400 [d]	40	No
Zinc	93	20	14	14	1.0	615	157	9,100	910	No
VOCs										
Benzene	0.043	0.018	29	3	0.10	nc	nc	0.02	0.002	Yes
Ethylbenzene	1.4	0.11	29	12	0.41	nc	nc	5.5	0.55	Yes
m,p-Xylene	4	0.15	24	13	0.54	nc	nc	na	na	Yes
o-Xylene	1.5	0.010	24	13	0.54	nc	nc	na	na	Yes
Toluene	0.86	0.018	29	7	0.24	nc	nc	5.4	0.54	Yes
Xylenes	2.4	0.037	5	2	0.40	nc	nc	78	7.8	No
PCBs										
PCB-1260 (Aroclor 1260)	115	0.0065	33	23	0.70	nc	nc	10	1.0	Yes
PAHs										
Acenaphthene	0.21	0.00038	24	15	0.63	nc	nc	210	21	No
Acenaphthylene	0.052	0.00055	24	2	0.08	nc	nc	210	21	No
Anthracene	0.0165	0.00030	24	15	0.63	nc	nc	4,300	430	No
Benzo(a)anthracene	0.030	0.00023	24	14	0.58	nc	nc	6	0.6	No
Benzo(a)pyrene	0.028	0.00028	24	6	0.25	nc	nc	1	0.1	No
Benzo(b)fluoranthene	0.039	0.00032	24	18	0.75	nc	nc	11	1.1	No
Benzo(g,h,i)perylene	0.018	0.00015	24	13	0.54	nc	nc	1,500	150	No
Benzo(k)fluoranthene	0.023	0.00017	24	5	0.21	nc	nc	110	11	No
Chrysene	0.087	0.00042	24	18	0.75	nc	nc	620	62	No
Dibenzo(a,h)anthracene	0.0043	0.00029	24	2	0.08	nc	nc	1	0.1	No
Fluoranthene	0.0808	0.00044	24	18	0.75	nc	nc	2,100	210	No

Table E-14
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 13
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Fluorene	0.69	0.00087	24	14	0.6	nc	nc	270	27	No
Indeno(1,2,3-cd)pyrene	0.016	0.00017	24	7	0.29	nc	nc	11	1.1	No
Naphthalene	15	0.0037	24	19	0.8	nc	nc	21	2.1	Yes
Phenanthrene	0.29	0.00081	24	18	0.8	nc	nc	4,300	430	No
Pyrene	0.090	0.00066	24	20	0.83	nc	nc	1,500	150	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	12,000	21	29	29	1.0	nc	nc	250	25	Yes
Gasoline Range Organics (GRO)	294	3.0	29	20	0.69	nc	nc	300	30	Yes
Residual Range Organics (RRO)	3,400	7.4	24	24	1.0	nc	nc	10,000	1,000	Yes
TRPH	36,300	551	8	8	1.0	nc	nc	NA [e]	NA	No

Notes:
NA - Not applicable.
na - Not available.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

Table E-14
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 13
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-15
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 13
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Arsenic	0.073	0.036	2	2	1.0	0.025	nc	0.05	0.005	Yes
Chromium	0.24	0.14	2	2	1.0	1.7	nc	0.1	0.01	No
Copper	0.21	0.14	2	2	1.0	0.087	nc	1.3	0.13	Yes
Lead	0.45	0.33	2	2	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Nickel	0.17	0.12	2	2	1.0	0.056	nc	0.1	0.01	Yes
Zinc	0.66	0.49	2	2	1.0	0.29	nc	11	1.1	No
Inorganics, Dissolved										
Arsenic, Dissolved	0.011	0.011	2	1	0.50	0.015	nc	0.05	0.005	No
Lead, Dissolved	0.015	0.015	2	1	0.50	nc	nc	0.015	0.0015	Yes
VOCs										
Benzene	0.12	0.00012	8	5	0.63	nc	nc	0.005	0.0005	Yes
Ethylbenzene	0.15	0.018	8	8	1.0	nc	nc	0.7	0.07	Yes
m,p-Xylene	0.14	0.016	4	4	1.0	nc	nc	10	1	No
o-Xylene	0.071	0.00064	4	4	1.0	nc	nc	10	1	No
Toluene	0.17	0.00011	8	5	0.63	nc	nc	1	0.1	Yes
Xylenes	0.59	0.056	4	4	1.0	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	100	6.1	8	8	1.0	nc	nc	1.5	0.15	Yes
Gasoline Range Organics (GRO)	4	0.52	6	6	1.0	nc	nc	1.3	0.13	Yes
Residual Range Organics (RRO)	2.3	0.18	5	4	0.80	nc	nc	1.1	0.11	Yes
TRPH	190	24	2	2	1.0	nc	nc	NA [e]	NA	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

Table E-15
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 13
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)

na - Not available.

nc - Not calculated.

SVOC - Semivolatile Organic Compounds

VOC - Volatile Organic Compounds

TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

e TRPH is excluded as a COPC due to outdated analysis methods.

Table E-16
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 15
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Chromium	16	6.7	2	2	1.0	48	50	26	2.6	No
Lead	30	12	2	2	1.0	106	112	400 [d]	40	No
Zinc	61	47	2	2	1.0	615	157	9100	910	No
VOCs										
Ethylbenzene	1.0	0.025	4	2	0.50	na	na	5.5	0.55	Yes
m,p-Xylene	1.8	0.043	2	2	1.0	na	na	na	na	Yes
o-Xylene	0.015	0.015	2	1	0.50	na	na	na	na	Yes
Toluene	0.032	0.0037	4	2	0.50	na	na	5.4	0.54	No
PAHs										
Acenaphthene	0.85	0.11	2	2	1.0	na	na	210	21	No
Anthracene	0.043	0.011	2	2	1.0	na	na	4,300	430	No
Benzo(a)anthracene	0.0017	0.00037	2	2	1.0	na	na	6	0.6	No
Benzo(a)pyrene	0.00041	0.00041	2	1	0.50	na	na	1	0.1	No
Benzo(b)fluoranthene	0.0017	0.00042	2	2	1.0	na	na	11	1.1	No
Benzo(g,h,i)perylene	0.00045	0.00045	2	1	0.50	na	na	1,500	150	No
Benzo(k)fluoranthene	0.0016	0.0016	2	1	0.50	na	na	110	11	No
Chrysene	0.0038	0.00094	2	2	1.0	na	na	620	62	No
Fluoranthene	0.0058	0.0017	2	2	1.0	na	na	2,100	210	No
Fluorene	2.7	0.47	2	2	1.0	na	na	270	27	No
Indeno(1,2,3-cd)pyrene	0.00019	0.00019	2	1	0.50	na	na	11	1.1	No
Naphthalene	28	0.9	2	2	1.0	na	na	21	2.1	Yes
Phenanthrene	0.95	0.27	2	2	1.0	na	na	4,300	430	No
Pyrene	0.010	0.0035	2	2	1.0	na	na	1,500	150	No
Petroleum Hydrocarbons										

Table E-16
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 15
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Diesel Range Organics (DRO)	16,000	2,190	4	4	1.0	nc	nc	250	25	Yes
Gasoline Range Organics (GRO)	110	60	4	2	0.50	nc	nc	300	30	Yes
Residual Range Organics (RRO)	33	12	2	2	1.0	nc	nc	10,000	1,000	No
TRPH	20,500	535	2	2	1.0	nc	nc	NA [e]	NA	No

Notes:
NA - Not applicable.
na - Not available.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-17
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 15
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Arsenic	0.11	0.11	1	1	1.0	0.025	nc	0.05	0.005	Yes
Beryllium	0.020	0.020	1	1	1.0	0.021	nc	0.004	0.0004	No
Chromium	0.070	0.070	1	1	1.0	1.7	nc	0.1	0.01	No
Copper	0.060	0.060	1	1	1.0	0.087	nc	1.3	0.13	No
Lead	0.68	0.68	1	1	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Nickel	0.20	0.20	1	1	1.0	0.056	nc	0.1	0.01	Yes
Zinc	1.0	1.0	1	1	1.0	0.29	nc	11	1.1	No
Inorganics, Dissolved										
Arsenic, Dissolved	0.0060	0.0060	1	1	1.0	nc	nc	0.05	0.005	Yes
VOCs										
Xylenes	0.025	0.025	2	1	0.50	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	960	9.3	2	2	1.0	nc	nc	1.5	0.15	Yes
Residual Range Organics (RRO)	3.8	3.8	1	1	1.0	nc	nc	1.1	0.11	Yes
TRPH	31	31	1	1	1.0	nc	nc	NA [e]	NA	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

VOC - Volatile Organic Compounds

TRPH - Total Residual Petroleum Hydrocarbons

Table E-17
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 15
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

e TRPH is excluded as a COPC due to outdated analysis methods.

Table E-18
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 16
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Antimony	21	14	13	2	0.15	nc	nc	3.6	0.36	Yes
Arsenic	12	3.3	13	13	1.0	7.8	11	2	0.2	Yes
Beryllium	1.2	1.1	13	2	0.15	3.8	nc	42	4.2	Yes
Cadmium	7.2	1.4	13	4	0.31	1.4	3.1	5	0.5	Yes
Chromium	147	8.9	13	13	1.0	48	50	26	2.6	Yes
Copper	26	6.1	13	13	1.0	107	44	4060	406	No
Lead	822	18	15	15	1.0	106	112	400 [d]	40	Yes
Nickel	23	5.0	13	13	1.0	59	30	87	8.7	No
Thallium	0.26	0.19	13	2	0.15	1.6	0.56	na	na	Yes
Zinc	12,100	41	13	13	1.0	615	157	9100	910	Yes
VOCs										
Acetone	0.018	0.018	4	1	0.25	nc	nc	10	1	No
Methylene chloride	0.0072	0.0061	4	2	0.50	nc	nc	0.015	0.0015	Yes
Toluene	0.015	0.0066	4	2	0.50	nc	nc	5.4	0.54	No
SVOCs										
Benzoic acid	1.3	1.3	13	1	0.077	nc	nc	390	39	No
Di-n-butyl phthalate	2.1	0.47	13	5	0.38	nc	nc	1700	170	No
PCBs										
PCB-1254 (Aroclor 1254)	0.20	0.20	15	1	0.067	nc	nc	10	1	No
PCB-1260 (Aroclor 1260)	1.4	0.019	15	6	0.40	nc	nc	10	1	Yes
Pesticides										
4,4'-DDD	0.0060	0.0060	14	1	0.071	nc	nc	34.6	3.46	No
4,4'-DDE	0.0050	0.0050	14	1	0.071	nc	nc	24	2.4	No

Table E-18
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 16
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
4,4'-DDT	0.12	0.011	14	2	0.14	nc	nc	24	2.4	No
Endosulfan I	0.0025	0.0025	2	1	0.50	nc	nc	7	0.7	No

Notes:
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PCB - Polychlorinated Hydrocarbons
SVOC - Semivolatile Organic Compounds
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

Table E-19
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 16
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data					Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Beryllium	0.040	0.020	3	2	0.67	0.021	nc	0.004	0.0004	Yes
Cadmium	0.060	0.060	3	1	0.33	0.060	nc	0.005	0.0005	Yes
Chromium	0.52	0.14	3	3	1.0	1.7	nc	0.1	0.01	No
Copper	0.50	0.16	3	3	1.0	0.087	nc	1.3	0.13	Yes
Lead	0.67	0.0029	5	5	1.0	0.013	nc	0.015	0.0015	Yes
Nickel	0.42	0.11	3	3	1.0	0.056	nc	0.1	0.01	Yes
Zinc	1.5	0.54	3	3	1.0	0.29	nc	11	1.1	Yes
Inorganics, Dissolved										
Lead, Dissolved	0.0040	0.0040	3	1	0.33	nc	nc	0.015	0.0015	Yes
VOCs										
1,2,4-Trimethylbenzene	0.053	0.00080	5	3	0.60	na	na	1.85	0.185	No
1,3,5-Trimethylbenzene	0.016	0.0093	5	2	0.40	na	na	1.85	0.185	No
2-Butanone	0.0048	0.0048	5	1	0.20	na	na	22	2.2	No
4-Isopropyltoluene	0.0066	0.0066	5	1	0.20	na	na	na	na	Yes
Ethylbenzene	0.0047	0.0041	5	2	0.40	na	na	0.7	0.07	No
Isopropylbenzene	0.0047	0.0027	5	2	0.40	na	na	3.65	0.365	No
m,p-Xylene	0.010	0.0035	5	2	0.40	na	na	10	1	No
n-Propylbenzene	0.0049	0.0043	5	2	0.40	na	na	na	na	Yes
sec-Butylbenzene	0.0040	0.0040	5	1	0.20	na	na	na	na	Yes
Toluene	0.0010	0.0010	5	1	0.20	na	na	1	0.1	No
Trichloroethene	0.0033	0.0033	5	1	0.20	na	na	0.005	0.0005	Yes
Xylenes	0.0035	0.0035	2	1	0.50	na	na	10	1	No
SVOCs										
Benzoic acid	0.015	0.015	5	1	0.20	na	na	146	14.6	No
bis-(2-ethylhexyl)phthalate	0.025	0.0014	5	3	0.60	na	na	0.006	0.0006	Yes
PAHs										
Acenaphthene	0.000050	0.000050	6	1	0.17	na	na	2.2	0.22	No

Table E-19
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 16
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data									
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
Fluorene	0.000080	0.000080	6	1	0.17	na	na	1.46	0.146	No
Naphthalene	0.088	0.0015	8	3	0.38	na	na	1.46	0.146	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

PAH - Polynuclear Aromatic Hydrocarbons

SVOC -Semivolatile Organic Compounds

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] This analyte is excluded as a COPC due to status as an essential nutrient.

[e] Total PCBs used as a surrogate.

[f] Alpha-BHC used as a surrogate.

[g] Endrin used as a surrogate.

[h] Screening criteria is currently not available for dioxins and furans. These analytes are therefore carried through as COPCs.

[i] RRO_aliphatic is non soluable and is therefore excluded as a COPC.

Table E-19
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 16
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data									
			Number of			Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Detection Frequency	Shallow	Deep	(mg/L)	(mg/L)	COPC? (Yes/No)

[j] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-20
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 19
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Arsenic	4.4	3.9	3	3	1.0	7.8	11	2	0.2	No
Cadmium	3.2	2.9	8	2	0.25	1.4	3.1	5	0.5	Yes
Chromium	59	4.4	16	16	1.0	48	50	26	2.6	Yes
Copper	38	13	8	8	1.0	107	44	4,060	406	No
Lead	329	14	16	16	1.0	106	112	400 [d]	40	Yes
Nickel	20	7.8	8	8	1.0	59	30	87	8.7	No
Zinc	282	36	16	16	1.0	615	157	9,100	910	No
VOCs										
Benzene	0.74	0.74	15	1	0.067	nc	nc	0.02	0.002	Yes
Ethylbenzene	3.0	0.22	15	2	0.13	nc	nc	5.5	0.55	Yes
m,p-Xylene	0.20	0.20	8	1	0.13	nc	nc	na	na	Yes
Toluene	3.1	3.1	15	1	0.067	nc	nc	5.4	0.54	Yes
Xylenes	17.3	8.0	7	2	0.29	nc	nc	78	7.8	Yes
PAHs										
Acenaphthene	0.14	0.14	8	1	0.13	nc	nc	210	21	No
Anthracene	0.032	0.032	8	1	0.13	nc	nc	4,300	430	No
Benzo(a)anthracene	0.0011	0.00051	8	2	0.25	nc	nc	6	0.6	No
Benzo(b)fluoranthene	0.0018	0.00023	8	8	1.0	nc	nc	11	1.1	No
Benzo(g,h,i)perylene	0.00065	0.00014	8	3	0.38	nc	nc	1,500	150	No
Chrysene	0.0027	0.00018	8	6	0.75	nc	nc	620	62	No
Dibenzo(a,h)anthracene	0.00048	0.00048	8	1	0.13	nc	nc	1	0.1	No
Fluoranthene	0.0041	0.0041	8	1	0.13	nc	nc	2,100	210	No
Fluorene	0.35	0.00022	8	2	0.25	nc	nc	270	27	No
Indeno(1,2,3-cd)pyrene	0.00048	0.00024	8	2	0.25	nc	nc	11	1.1	No
Naphthalene	1.3	0.00038	8	8	1.0	nc	nc	21	2.1	No

Table E-20
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 19
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Phenanthrene	0.45	0.00026	8	5	0.63	nc	nc	4,300	430	No
Pyrene	0.011	0.00014	8	5	0.63	nc	nc	1,500	150	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	13,300	7.0	16	14	0.88	nc	nc	250	25	Yes
Gasoline Range Organics (GRO)	6,650	4.9	16	5	0.31	nc	nc	300	30	Yes
Residual Range Organics (RRO)	120	6.0	8	8	1.0	nc	nc	10,000	1,000	No
TRPH	28,800	389	8	8	1.0	nc	nc	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-20
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 19
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-21
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 19
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) [a] Shallow	Subsurface Water BUTL (mg/L) [a] Deep	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Arsenic	0.0060	0.0060	1	1	1.0	0.025	nc	0.05	0.005	No
Chromium	0.080	0.080	2	1	0.50	1.7	nc	0.1	0.01	No
Copper	0.20	0.040	2	2	1.0	0.087	nc	1.3	0.13	Yes
Lead	0.42	0.14	2	2	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Magnesium	9.5	9.5	1	1	1.0	nc	nc	NA [e]	NA	No
Zinc	0.43	0.18	2	2	1.0	0.29	nc	11	1.1	No
VOCs										
Benzene	0.025	0.00057	8	4	0.50	na	na	0.005	0.0005	Yes
Ethane	0.0017	0.0017	4	1	0.25	na	na	na	na	Yes
Ethylbenzene	0.025	0.00034	8	2	0.25	na	na	0.7	0.07	No
m,p-Xylene	0.02	0.00022	4	3	0.75	na	na	10	1	No
o-Xylene	0.00013	0.000080	4	3	0.75	na	na	10	1	No
Toluene	0.026	0.00024	8	4	0.50	na	na	1	0.1	No
Xylenes	0.064	0.00080	4	3	0.75	na	na	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	34	0.71	8	8	1.0	na	na	1.5	0.15	Yes
Gasoline Range Organics (GRO)	6.1	0.024	6	4	0.67	na	na	1.3	0.13	Yes
Residual Range Organics (RRO)	1.3	0.22	6	3	0.50	na	na	1.1	0.11	Yes
TRPH	9.7	9.7	2	1	0.50	na	na	NA [f]	NA	No

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

Table E-21
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 19
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

e This analyte is excluded as a COPC due to status as an essential nutrient.

[f] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-22
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Aluminum	33,100	3,975	10	10	1.00	30,357	nc	na	na	Yes
Antimony	38	38	19	1	0.053	nc	nc	3.6	0.36	Yes
Arsenic	170	2.8	19	19	1.0	7.8	11	2	0.2	Yes
Barium	193	0.83	10	10	1.0	174	nc	1,100	110	Yes
Beryllium	1.8	0.30	19	9	0.47	3.8	nc	42	4.2	No
Cadmium	69	0.40	19	8	0.42	1.4	3.1	5	0.5	Yes
Calcium	6,910	1,320	10	10	1.0	nc	nc	NA [e]	NA	No
Chromium	93	4.0	19	19	1.0	48	50	26	2.6	Yes
Cobalt	14.2	2.5	10	10	1.0	49	nc	na	na	Yes
Copper	130	4.0	19	19	1.0	107	44	4,060	406	No
Iron	57,400	12,700	10	10	1.0	nc	nc	NA [e]	NA	No
Lead	88	6.1	20	18	0.90	106	112	400 [d]	40	No
Magnesium	8,770	1,320	10	10	1.0	nc	nc	NA [e]	NA	No
Manganese	786	77	10	10	1.0	1,589	nc	na	na	Yes
Mercury	4.8	0.070	19	6	0.32	0.43	nc	1.4	0.14	Yes
Nickel	44	9.8	19	14	0.74	59	30	87	8.7	No
Potassium	3,670	560	10	10	1.0	nc	nc	NA [e]	NA	No
Selenium	2.0	1.0	19	3	0.16	nc	nc	3.5	0.35	Yes
Silver	6.7	0.90	19	3	0.16	nc	nc	21	2.1	Yes
Sodium	580	170	10	10	1.0	nc	nc	NA [e]	NA	No
Thallium	0.53	0.53	19	1	0.1	1.6	0.56	na	na	Yes
Vanadium	81	8.5	10	10	1.0	73	nc	710	71	Yes
Zinc	1,130	24	19	19	1.0	615	157	9,100	910	Yes
VOCs										
1,1,1-Trichloroethane	0.016	0.016	4	1	0.25	nc	nc	1	0.1	No
1,2,4-Trimethylbenzene	0.19	0.032	4	2	0.50	nc	nc	na	na	Yes

Table E-22
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
1,3,5-Trimethylbenzene	0.071	0.012	4	2	0.50	nc	nc	25	2.5	No
2-Butanone	0.18	0.043	5	3	0.60	nc	nc	60	6	No
Acetone	0.53	0.036	4	4	1.0	nc	nc	10	1	No
Ethylbenzene	0.0067	0.0067	19	1	0.053	nc	nc	5.5	0.55	No
Isopropylbenzene	0.013	0.013	4	1	0.25	nc	nc	227	22.7	No
m,p-Xylene	0.096	0.0074	14	7	0.50	nc	nc	na	na	Yes
Methylene chloride	0.0060	0.0060	4	1	0.25	nc	nc	0.015	0.0015	Yes
n-Butylbenzene	0.062	0.062	4	1	0.25	nc	nc	na	na	Yes
n-Propylbenzene	0.040	0.040	4	1	0.25	nc	nc	na	na	Yes
o-Xylene	0.0063	0.0063	14	1	0.071	nc	nc	na	na	Yes
sec-Butylbenzene	0.036	0.036	4	1	0.25	nc	nc	na	na	Yes
Toluene	0.14	0.0060	19	13	0.68	nc	nc	5.4	0.54	No
SVOCs										
4-Chloroaniline	5.47	5.47	9	1	0.11	nc	nc	0.5	0.05	Yes
bis-(2-ethylhexyl)phthalate	0.98	0.84	9	2	0.22	nc	nc	590	59	No
Di-n-butyl phthalate	5.69	0.90	9	4	0.44	nc	nc	1,700	170	No
PCBs										
PCB-1254 (Aroclor 1254)	0.14	0.14	19	2	0.11	nc	nc	10	1	No
PCB-1260 (Aroclor 1260)	3.1	0.15	19	4	0.21	nc	nc	10	1	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3,800	46	19	16	0.84	nc	nc	250	25	Yes
Residual Range Organics (RRO)	3,700	25	10	10	1.0	nc	nc	10,000	1,000	Yes
TRPH	15,700	85	9	9	1.0	nc	nc	NA [f]	NA	No

Notes:

Table E-22
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)

na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PCB - Polychlorinated Biphenyls
SVOC - Semivolatile Organic Compounds
VOC - Volatile Organic Compounds
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] This analyte is excluded as a COPC due to status as an essential nutrient.

[f] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-23
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data					Subsurface Water BUTL (mg/L) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Arsenic	0.072	0.041	2	2	1.0	0.025	nc	0.05	0.005	Yes
Chromium	0.23	0.090	2	2	1.0	1.7	nc	0.1	0.01	No
Copper	0.26	0.10	2	2	1.0	0.087	nc	1.3	0.13	Yes
Lead	0.26	0.10	2	2	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Mercury	0.00060	0.00060	2	1	0.50	0.00041	nc	0.002	0.0002	Yes
Nickel	0.18	0.10	2	2	1.0	0.056	nc	0.1	0.01	Yes
Zinc	5.1	0.65	2	2	1.0	0.29	nc	11	1.1	Yes
Inorganics, Dissolved										
Arsenic, Dissolved	0.010	0.010	2	1	0.50	0.015	nc	0.05	0.005	No
VOCs										
2-Butanone	0.0029	0.0029	2	1	0.50	na	na	22	2.2	No
Acetone	0.0063	0.0063	2	1	0.50	na	na	3.65	0.365	No
n-Propylbenzene	0.0011	0.0011	2	1	0.50	na	na	na	na	Yes
SVOCs										
Benzoic acid	0.029	0.029	2	1	0.50	na	na	146	14.6	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	1.0	0.59	2	2	1.0	na	na	1.5	0.15	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

Table E-23
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

Table E-24
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics										
Antimony	34	34	1	1	1.0	nc	nc	3.6	0.36	No
Chromium	16	7.7	5	5	1.0	48	50	26	2.6	No
Copper	22	22	1	1	1.0	107	44	4,060	406	No
Lead	497	5	9	9	1.0	106	112	400 [d]	40	Yes
Nickel	13	13	1	1	1.0	59	30	87	8.7	No
Zinc	169	60	5	5	1.0	615	157	9,100	910	No
VOCs										
o-Xylene	0.3705	0.149	8	3	0.375	nc	nc	na	na	Yes
SVOCs										
Di-n-butyl phthalate	3.5	3.5	1	1	1.0	nc	nc	1,700	170	No
PAHs										
Acenaphthene	0.0861	0.00763	11	4	0.36	nc	nc	210	21	No
Anthracene	0.01180	0.00020	11	3	0.27	nc	nc	4,300	430	No
Benzo(a)anthracene	0.0200	0.0015	11	3	0.27	nc	nc	6	0.6	No
Benzo(a)pyrene	0.35	0.35	11	1	0.09	nc	nc	1	0.1	Yes
Benzo(b)fluoranthene	0.42	0.00035	11	4	0.36	nc	nc	11	1.1	No
Benzo(g,h,i)perylene	0.015	0.00015	11	4	0.36	nc	nc	1,500	150	No
Chrysene	0.77	0.00020	11	7	0.64	nc	nc	620	62	No
Dibenzo(a,h)anthracene	0.00032	0.00032	11	1	0.09	nc	nc	1	0.1	No
Fluoranthene	0.0481	0.00070	11	7	0.64	nc	nc	2,100	210	No
Fluorene	0.03563	0.00020	11	3	0.27	nc	nc	270	27	No
Indeno(1,2,3-cd)pyrene	0.00032	0.00032	11	1	0.09	nc	nc	11	1.1	No
Naphthalene	1.2005	0.00031	11	8	0.73	nc	nc	21	2.1	No
Phenanthrene	0.2090	0.00022	11	8	0.73	nc	nc	4,300	430	No

Table E-24
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
Phenol	0.74	0.74	1	1	1.0	nc	nc	67	6.7	No
Pyrene	0.1011	0.00018	11	7	0.64	nc	nc	1,500	150	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	4,070	284	10	5	0.50	nc	nc	250	25	Yes
Gasoline Range Organics (GRO)	38.45	24.1	10	3	0.30	nc	nc	300	30	Yes
Residual Range Organics (RRO)	3,815	5.4	8	7	0.88	nc	nc	10,000	1,000	Yes
TRPH	5,920	5,920	1	1	1.0	nc	nc	NA [e]	NA	No

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
SVOC - Semivolatile Organic Compounds
TRPH - Total Residual Petroleum Hydrocarbons

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

Table E-24
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-25
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Deep Subsurface Water Concentration (mg/L)							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) Shallow	Subsurface Water BUTL (mg/L) Deep	Criteria[a] (mg/L)	Benchmark[b] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Iron	45	2.8	3	3	1.0	nc	nc	NA [d]	NA	No
Manganese	0.20	0.12	3	3	1.0	0.20	nc	na	na	Yes
Inorganics, Dissolved										
Iron, dissolved	1.8	1.8	3	1	0.33	nc	nc	NA [d]	NA	No
Manganese, dissolved	0.17	0.089	3	3	1.0	nc	nc	na	na	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	1.4	0.28	4	2	0.50	na	na	1.5	0.15	Yes
Residual Range Organics (RRO)	2.8	2.8	3	1	0.33	na	na	1.1	0.11	Yes

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/L - Milligram per liter.
COPC - Chemical of Potential Concern

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] This analyte is excluded as a COPC due to status as an essential nutrient.

Table E-26
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 27
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Criteria[a]	Benchmark[b]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Arsenic						5.7	2.5	4	4	1.0	7.8	11	2	0.2	No
Chromium	17	17	1	1	1.0	23.7	3.7	10	10	1.0	48	50	26	2.6	No
Copper						16	16	1	1	1.0	107	44	4,060	406	No
Lead	13	13	1	1	1.0	87	3.53	27	27	1.0	106	112	400 [d]	40	No
Nickel						17	17	1	1	1.0	59	30	87	8.7	No
Thallium						0.36	0.36	1	1	1.0	1.6	0.56	na	na	No
Zinc	44	44	1	1	1.0	110	17	10	10	1.0	615	157	9,100	910	No
VOCs															
Benzene	0.12	0.12	1	1	1.0	0.798	0.0034	29	10	0.34	nc	nc	0.02	0.002	Yes
Ethylbenzene	1.3	1.3	1	1	1.0	8.09	0.011	29	18	0.62	nc	nc	5.5	0.55	Yes
m,p-Xylene	5.1	5.1	1	1	1.0	25.3	0.0678	24	20	0.8	nc	nc	na	na	Yes
o-Xylene	2.7	2.7	1	1	1.0	16.3	0.010	24	20	0.83	nc	nc	na	na	Yes
Toluene	3.2	3.2	1	1	1.0	7.55	0.036	29	10	0.34	nc	nc	5.4	0.54	Yes
Xylenes						4	0.0050	5	4	0.80	nc	nc	78	7.8	No
PCBs															
PCB-1260 (Aroclor 1260)						0.035	0.035	9	1	0.11	nc	nc	10	1	No
PAHs															
Acenaphthene	0.18	0.18	1	1	1.0	3.09	0.00028	24	15	0.63	nc	nc	210	21	No
Acenaphthylene						0.0727	0.0011	24	2	0.08	nc	nc	210	21	No
Anthracene	0.012	0.012	1	1	1.0	0.90	0.00076	24	13	0.54	nc	nc	4,300	430	No
Benzo(a)anthracene						0.081	0.00027	24	8	0.33	nc	nc	6	0.6	No
Benzo(a)pyrene						0.0774	0.0032	24	2	0.08	nc	nc	1	0.1	No
Benzo(b)fluoranthene	0.0052	0.0052	1	1	1.0	0.114	0.00027	24	10	0.42	nc	nc	11	1.1	No
Benzo(g,h,i)perylene						0.0427	0.00020	24	7	0.29	nc	nc	1500	150	No
Benzo(k)fluoranthene						0.0909	0.0033	24	2	0.08	nc	nc	110	1.14	No
Chrysene						0.148	0.00067	24	13	0.54	nc	nc	620	62	No
Dibenzo(a,h)anthracene						0.0151	0.0151	24	1	0.04	nc	nc	1	0.1	No
Fluoranthene	0.0029	0.0029	1	1	1.0	0.331	0.00019	24	15	0.6	nc	nc	2,100	210	No
Fluorene	0.33	0.33	1	1	1.0	7.44	0.00051	24	20	0.8	nc	nc	270	27	No
Indeno(1,2,3-cd)pyrene						0.0505	0.0018	24	2	0.1	nc	nc	11	1.1	No
Naphthalene	12	12	1	1	1.0	191	0.0011	24	22	0.9	nc	nc	43	4.3	Yes
Phenanthrene	0.21	0.21	1	1	1.0	5.5	0.00084	24	22	0.9	nc	nc	4,300	430	No
Pyrene	0.0059	0.0059	1	1	1.0	0.391	0.00017	24	18	0.8	nc	nc	1,500	150	No
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	13,000	13,000	1	1	1.0	51,000	11	34	34	1.0	nc	nc	250	25	Yes
Gasoline Range Organics (GRO)	70	70	1	1	1.0	491	2.3	29	22	0.76	nc	nc	300	30	Yes
Residual Range Organics (RRO)	5,100	5,100	1	1	1.0	9,100	16	24	22	0.9	nc	nc	10,000	1,000	Yes
TRPH						66,400	170	10	10	1.0	nc	nc	NA [e]	NA	No

Table E-26
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 27
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Criteria[a]	Benchmark[b]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

Notes:
na - Not available.
NA - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyls
TRPH - Total Residual Petroleum Hydrocarbons
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:
1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-27
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 27
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L) Shallow	Subsurface Water BUTL (mg/L) Deep	Criteria[a] (mg/L)	Benchmark[b] (mg/L)	COPC? (Yes/No)
Inorganics, Total										
Arsenic	0.024	0.024	1	1	1.0	0.025	nc	0.05	0.005	No
Chromium	0.050	0.050	1	1	1.0	1.7	nc	0.1	0.01	No
Copper	0.065	0.065	1	1	1.0	0.087	nc	1.3	0.13	No
Lead	0.19	0.19	1	1	1.0	0.013	nc	0.015 [d]	0.0015	Yes
Manganese	0.20	0.20	1	1	1.0	0.20	nc	na	na	Yes
Nickel	0.043	0.043	1	1	1.0	0.056	nc	0.1	0.01	No
Zinc	0.24	0.24	1	1	1.0	0.29	nc	11	1.1	No
Inorganics, Dissolved										
Lead, Dissolved	0.0020	0.0020	1	1	1.0	nc	nc	0.015	0.0015	Yes
VOCs										
Benzene	0.030	0.0046	3	2	0.67	nc	nc	0.005	0.0005	Yes
Ethylbenzene	0.12	0.014	3	2	0.67	nc	nc	0.7	0.07	Yes
m,p-Xylene	0.084	0.084	1	1	1.0	nc	nc	10	1	No
o-Xylene	0.0073	0.0073	1	1	1.0	nc	nc	10	1	No
Toluene	0.12	0.0033	3	2	0.67	nc	nc	10	1	No
Xylenes	0.080	0.080	2	1	0.50	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	64	1.4	3	3	1.0	nc	nc	1.5	0.15	Yes
Gasoline Range Organics (GRO)	1.7	1.2	3	2	0.67	nc	nc	1.3	0.13	Yes
Residual Range Organics (RRO)	1.6	1.6	1	1	1.0	nc	nc	1.1	0.11	Yes
TRPH	2.4	2.4	1	1	1.0	nc	nc	NA [e]	NA	No

Notes:
BUTL - Background upper tolerance limit.
COPC - Chemcial of Potential Concern.
mg/L - Milligrams per liter.
NA - Not applicable.
na - Not available.
nc - Not calculated.
TRPH - Total Residual Petroleum Hydrocarbons
VOC - Volatile Organic Compounds

Table E-27
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 27
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L)		Criteria[a]	Benchmark[b]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-28
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data									
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Beryllium	na	na	na	na	na	1.8	1.8	11	1	0.091	3.8	nc	42	4.2	Yes
Cadmium	na	na	na	na	na	2.6	2.4	11	2	0.18	1.4	3.1	5	0.5	No
Chromium	31	14	6	6	1.0	41	7.3	11	11	1.0	48	50	26	2.6	No
Copper	na	na	na	na	na	34	8.8	11	11	1.0	107	44	4,060	406	No
Lead	42	24	6	6	1.0	100	7.1	11	11	1.0	106	112	400 [d]	40	No
Nickel	na	na	na	na	na	25	7.8	11	8	0.73	59	30	87	8.7	No
Thallium	na	na	na	na	na	0.26	0.26	11	1	0.091	1.6	0.56	na	na	Yes
Zinc	124	49	6	6	1.0	140	12	11	11	1.0	615	157	9,100	910	No
VOCs															
Acetone	na	na	na	na	na	0.19	0.032	5	3	0.60	nc	nc	10	1	No
Ethylbenzene	na	na	na	na	na	1.1	1.1	10	1	0.10	nc	nc	5.5	0.55	Yes
Methylene chloride	na	na	na	na	na	0.16	0.0071	5	4	0.80	nc	nc	0.015	0.0015	Yes
PCBs															
PCB-1254 (Aroclor 1254)	0.20	0.20	9	1	0.11	1.5	0.24	10	3	0.30	nc	nc	10	1	Yes
PAHs															
2-Methylnaphthalene	0.031	0.031	8	1	0.13	na	na	na	na	na	nc	nc	43	4.3	No
Anthracene	1.9	0.016	8	2	0.25	na	na	na	na	na	nc	nc	4,300	430	No
Benzo(a)anthracene	4.4	4.4	8	1	0.13	na	na	na	na	na	nc	nc	6	0.6	Yes
Benzo(a)pyrene	2.3	2.3	8	1	0.13	na	na	na	na	na	nc	nc	1	0.1	Yes
Benzo(b)fluoranthene	2.6	2.6	8	1	0.13	na	na	na	na	na	nc	nc	11	1.1	Yes
Benzo(g,h,i)perylene	0.056	0.056	8	1	0.13	na	na	na	na	na	nc	nc	1,500	150	No
Benzo(k)fluoranthene	2.7	2.7	8	1	0.13	na	na	na	na	na	nc	nc	110	11	No
Chrysene	5.5	5.5	8	1	0.13	na	na	na	na	na	nc	nc	620	62	No
Fluoranthene	9.3	0.035	8	2	0.25	na	na	na	na	na	nc	nc	2,100	210	No
Phenanthrene	4.1	0.016	8	2	0.25	na	na	na	na	na	nc	nc	4,300	430	No
Pyrene	7.5	0.025	8	2	0.25	na	na	na	na	na	nc	nc	1,500	150	No
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	83,000	95	10	10	1.0	92,650	7.9	11	10	0.91	nc	nc	250	25	Yes
Diesel Range Organics_Aromatic	59	59	2	1	0.50	na	na	na	na	na	nc	nc	100	10	Yes
Diesel Range Organics_Aliphatic	490	50	2	2	1.0	na	na	na	na	na	nc	nc	7,200	720	No
Gasoline Range Organics (GRO)	na	na	na	na	na	120	3.7	10	4	0.40	nc	nc	300	30	Yes
Residual Range Organics (RRO)	2,200	1,200	6	6	1.0	na	na	na	na	na	nc	nc	10,000	1,000	Yes
Residual Range Organics_Aromatic	360	230	2	2	1.0	na	na	na	na	na	nc	nc	3,000	300	Yes
TRPH	110,000	47,000	2	2	1.0	104,000	12	10	10	1.0	nc	nc	NA [e]	NA	No

Notes:
na - Not available.
NA- Not applicable.
nc - Not calculated.

Table E-28
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyls
TRPH - Total Residual Petroleum Hydrocarbons
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-29
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Sediment	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics									
Chromium	649	4.4	68	67	0.99	34	26	2.6	Yes
Copper	20	16	3	3	1.0	40	4,060	406	No
Lead	4,590	4.0	68	55	0.81	78	400 [d]	40	Yes
Nickel	13	13	3	1	0.33	126	87	8.7	No
Zinc	4,810	12	68	68	1.0	148	9,100	910	Yes
VOCs									
Benzene	0.050	0.050	8	1	0.13	na	0.02	0.002	Yes
Ethylbenzene	1.8	0.027	8	2	0.25	na	5.5	0.55	Yes
Toluene	0.37	0.0038	8	3	0.38	na	5.4	0.54	No
Xylenes	0.78	0.048	8	3	0.38	na	78	7.8	No
PCBs									
PCB-1242 (Aroclor 1242)	0.12	0.12	79	1	0.013	na	10 [e]	1	No
PCB-1254 (Aroclor 1254)	2.8	0.038	79	14	0.18	na	10 [e]	1	Yes
PCB-1260 (Aroclor 1260)	5.4	0.063	79	27	0.34	na	10 [e]	1	Yes
Pesticides									
4,4'-DDD	1.2	0.0072	13	6	0.46	na	35	3.5	No
beta-BHC	0.012	0.0036	10	2	0.20	na	0.009	0.0009	Yes
Endosulfan sulfate	0.0086	0.0086	10	1	0.10	na	7 [f]	0.7	No
gamma-BHC (Lindane)	0.0065	0.0029	13	2	0.15	na	0.003	0.0003	Yes
Heptachlor	0.0046	0.0044	13	2	0.15	na	0.8	0.08	No
Dioxins & Furans									
Dibenzofuran	5.6	0.026	68	26	0.38	na	na [g]	na	Yes
PAHs									
2-Methylnaphthalene	500	0.022	71	58	0.82	na	43	4.3	Yes
Acenaphthene	14	0.016	70	40	0.57	na	210	21	No

Table E-29
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg) [a]	Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Sediment	(mg/kg)	(mg/kg)	(Yes/No)
Acenaphthylene	0.047	0.047	71	1	0.014	na	210	21	No
Anthracene	1.8	0.0092	71	7	0.10	na	4,300	430	No
Benzo(a)anthracene	1.9	0.10	71	5	0.070	na	6	0.6	Yes
Benzo(a)pyrene	1.4	0.13	71	4	0.056	na	1	0.1	Yes
Benzo(b)fluoranthene	1.6	0.10	71	5	0.070	na	11	1.1	Yes
Benzo(g,h,i)perylene	0.91	0.037	71	2	0.028	na	1,500	150	No
Benzo(k)fluoranthene	1.9	0.19	71	4	0.056	na	110	11	No
Chrysene	2.6	0.031	71	7	0.10	na	620	62	No
Dibenzo(a,h)anthracene	0.015	0.015	71	1	0.014	na	1	0.1	No
Fluoranthene	14	0.0084	71	12	0.17	na	2,100	210	No
Fluorene	20	0.011	71	47	0.66	na	270	27	No
Indeno(1,2,3-cd)pyrene	1.2	0.046	71	3	0.042	na	11	1.1	Yes
Naphthalene	220	0.024	71	55	0.77	na	21	2.1	Yes
Phenanthrene	21	0.015	71	42	0.59	na	4,300	430	No
Pyrene	9.5	0.010	71	11	0.15	na	1,500	150	No
Petroleum Hydrocarbons									
Diesel Range Organics (DRO)	150,000	22	83	83	1.0	na	250	25	Yes
Diesel Range Organics_ Aromatic	60	60	3	1	0.33	na	100	10	Yes
Diesel Range Organics_Aliphatic	150,000	26	5	5	1.0	na	7,200	720	Yes
Gasoline Range Organics (GRO)	220	4.0	5	2	0.40	na	300	30	Yes
Residual Range Organics (RRO)	14,000	69	69	66	0.96	na	10,000	1,000	Yes
Residual Range Organics_ Aliphatic	11,000	58	5	4	0.80	na	20,000	2,000	Yes
Residual Range Organics_Aromatic	500	64	5	5	1.0	na	3,000	300	Yes
TRPH	127,000	21,500	5	5	1.0	na	NA [h]	NA	No

Notes:
na - Not available.
NA - Not applicable.
BUTL - Background upper tolerance limit.

Table E-29
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Sediment	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)

mg/kg - milligrams per kilogram.

COPC - Chemical of Potential Concern.

PAH - Polynuclear Aromatic Hydrocarbons

PCB - Polychlorinated Hydrocarbons

TRPH - Total Residual Petroleum Hydrocarbons

VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] COPC Screening Benchmark is equal to 1/10 the applicable regulatory critieria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] Total PCBs used as a surrogate.

f Endosulfan used as a surrogate.

[g] Screening criteria is currently not available for dioxins and furans. These analytes are therefore carried through as COPCs.

[h] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-30
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Surface Water
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fresh Surface Water Data					BUTL (mg/L) [a]		Regulatory Criteria [b] (mg/L)	COPC Screening Benchmark [c] (mg/L)	COPC? (Yes/No)
	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water			
Inorganics, Total										
Chromium	0.015	0.015	3	1	0.33	nc	nc	0.1	0.01	Yes
Copper	0.040	0.040	3	1	0.33	nc	0.083	0.0031	0.00031	Yes
Lead	0.086	0.086	3	1	0.33	nc	0.014	0.0081 [d]	0.00081	Yes
Zinc	0.62	0.62	3	1	0.33	nc	0.90	0.081	0.0081	Yes
Inorganics, Dissolved										
Lead, Dissolved	0.011	0.011	3	1	0.33	nc	nc	0.015	0.0015	Yes
Zinc, Dissolved	0.23	0.23	3	1	0.33	nc	0.093	11	1.1	Yes
VOCs										
Ethylbenzene	0.0016	0.0016	5	1	0.20	na	na	0.7	0.07	No
PCBs										
PCB-1260 (Aroclor 1260)	0.0019	0.0015	15	2	0.13	na	na	1.4E-05 [e]	0.0000014	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	326	0.39	17	17	1.0	na	na	1.5	0.15	Yes
Gasoline Range Organics (GRO)	0.57	0.57	5	1	0.20	na	na	1.3	0.13	Yes
TRPH	19	2.3	5	2	0.40	na	na	NA [f]	NA	No

Notes:

BUTL - Background upper tolerance limit.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

Table E-30
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Surface Water
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L) [a]		Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Fresh Surface	Ephemeral	Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Water	Surface Water	(mg/L)	(mg/L)	(Yes/No)

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[e] Total PCBs used as a surrogate.

[f] TRPH is excluded as a COPC due to outdated analysis methods.

Table E-31
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Subsurface Water
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data							Regulatory	COPC Screening	
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Arsenic	0.039	0.039	1	1	1.0	0.025	nc	0.05	0.005	Yes
Chromium	0.25	0.25	2	1	0.50	1.7	nc	0.1	0.01	No
Copper	0.18	0.18	2	1	0.50	0.087	nc	1.3	0.13	Yes
Lead	0.20	0.0080	2	2	1.0	0.013	nc	0.015	0.0015	Yes
Nickel	0.16	0.16	2	1	0.50	0.056	nc	0.1	0.01	Yes
Zinc	0.59	0.59	2	1	0.50	0.29	nc	11	1.1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3.2	0.49	2	2	1.0	na	na	1.5	0.15	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemcial of Potential Concern.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.
ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-32
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Plant Tissue
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg) [a]	Regulatory Criteria[b]	COPC Screening Benchmark[c]	COPC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Plant Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Antimony	0.0030	0.0030	1	1	1.0	nc	na	na	Yes
Arsenic	0.55	<0.06	5	1	0.20	nc	na	na	Yes
Barium	40	0.45	5	5	1.0	nc	na	na	Yes
Cadmium	1.1	0.0020	5	5	1.0	nc	na	na	Yes
Chromium	10	<0.06	5	4	0.80	nc	na	na	Yes
Copper	3.4	0.58	5	5	1.0	nc	na	na	Yes
Lead	5.0	0.065	5	5	1.0	nc	na	na	Yes
Mercury	0.027	<0.004	5	4	0.80	nc	na	na	Yes
Nickel	3.7	0.060	5	5	1.0	nc	na	na	Yes
Selenium	0.050	<0.025	5	1	0.20	nc	na	na	Yes
Silver	0.023	<0.002	5	2	0.40	nc	na	na	Yes
Vanadium	3.1	0.016	5	5	1.0	nc	na	na	Yes
Zinc	76	1.3	5	5	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.014	<0.005	5	3	0.60	nc	na	na	Yes
Acenaphthene	0.052	0.0038	5	4	0.80	nc	na	na	Yes
Anthracene	0.016	<0.005	5	4	0.80	nc	na	na	Yes
Benzo(a)anthracene	0.11	0.0045	5	4	0.80	nc	na	na	Yes
Benzo(a)pyrene	0.17	<0.005	5	2	0.40	nc	na	na	Yes
Benzo(b)fluoranthene	0.15	0.0037	5	4	0.80	nc	na	na	Yes
Benzo(g,h,i)perylene	0.099	0.0031	5	3	0.60	nc	na	na	Yes
Benzo(k)fluoranthene	0.16	<0.005	5	2	0.40	nc	na	na	Yes
Chrysene	0.21	0.005	5	4	0.80	nc	na	na	Yes
Dibenz(a,h)anthracene	0.033	0.0035	5	3	0.60	nc	na	na	Yes
Fluoranthene	0.50	<0.005	5	4	0.80	nc	na	na	Yes
Fluorene	0.041	<0.005	5	4	0.80	nc	na	na	Yes
Indeno(1,2,3-cd)pyrene	0.19	0.0027	5	4	0.80	nc	na	na	Yes
Naphthalene	0.022	0.0043	5	4	0.80	nc	na	na	Yes
Phenanthrene	0.56	0.0027	5	5	1.0	nc	na	na	Yes
Pyrene	0.48	<0.005	5	4	0.80	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	0.22	0.0049	5	5	1.0	nc	na	na	Yes
PCB-1260 (Aroclor 1260)	0.099	0.0049	5	5	1.00	nc	na	na	Yes

Table E-32
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Plant Tissue
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg) Maximum Detect	Plant Tissue Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Plant Tissue	Regulatory Criteria[b] (mg/kg)	COPC Screening Benchmark[c] (mg/kg)	COPC? (Yes/No)

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemical of Potential Concern.

mg/kg - Milligrams per kilogram.

NA - Not applicable.

na - Not available.

nc - Not calculated.

PAH - Polynuclear Aromatic Hydrocarbons

PCB - Polychlorinated Biphenyls

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Benchmark Criterion is not currently available for this media.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-33
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Sediment	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)
Inorganics									
Aluminum	15,900	4,820	4	4	1.0	nc	na	na	Yes
Arsenic	5.7	2.8	4	4	1.0	nc	2	0.2	Yes
Barium	115	40	4	4	1.0	nc	1,100	110	Yes
Beryllium	1.3	0.20	5	4	0.8	9.8	42	4.2	No
Calcium	3,270	1,580	4	4	1.0	nc	NA [d]	NA	No
Chromium	27	2.6	17	17	1.0	34	26	2.6	No
Cobalt	7.0	2.0	4	4	1.0	nc	na	na	Yes
Copper	11	1.8	5	5	1.0	40	4,060	406	No
Iron	14,900	8,720	4	4	1.0	nc	NA [d]	NA	No
Lead	24	3.2	17	17	1.0	78	400 [e]	40	No
Magnesium	3,770	2,030	4	4	1.0	nc	NA [d]	NA	No
Manganese	114	80	4	4	1.0	nc	na	na	Yes
Mercury	0.050	0.050	4	1	0.3	nc	1.4	0.14	Yes
Nickel	14	5.0	5	4	0.8	126	87	8.7	No
Potassium	1,360	930	4	4	1.0	nc	NA [d]	NA	No
Sodium	713	416	4	4	1.0	nc	NA [d]	NA	No
Vanadium	35	17	4	4	1.0	nc	710	71	Yes
Zinc	69	14	17	17	1.0	148	9,100	910	No
VOCs									
m,p-Xylene	0.0032	0.0032	4	1	0.25	na	na	na	Yes
Toluene	0.0097	0.0047	9	4	0.44	na	5.4	0.54	No
Dioxins & Furans									
Dibenzofuran	0.0086	0.0086	16	1	0.063	na	na [f]	na	Yes
PAHs									
2-Methylnaphthalene	0.23	0.012	21	4	0.19	na	43	4.3	No
Acenaphthene	0.014	0.014	21	1	0.048	na	210	21	No
Acenaphthylene	0.010	0.010	21	1	0.048	na	210	21	No

Table E-33
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Sediment	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)
Anthracene	0.023	0.023	21	1	0.048	na	4,300	430	No
Benzo(b)fluoranthene	0.0042	0.0042	21	1	0.048	na	11	1.1	No
Benzo(k)fluoranthene	0.0042	0.0042	21	1	0.048	na	110	11	No
Chrysene	0.0048	0.0048	21	1	0.048	na	620	62	No
Fluoranthene	0.022	0.010	21	3	0.14	na	2,100	210	No
Fluorene	0.022	0.013	21	3	0.14	na	270	27	No
Naphthalene	0.11	0.0098	21	3	0.14	na	21	2.1	No
Phenanthrene	0.037	0.010	21	4	0.19	na	4,300	430	No
Pyrene	0.02	0.0106	21	2	0.10	na	1,500	150	No
Petroleum Hydrocarbons									
Diesel Range Organics (DRO)	25,000	9.3	26	24	0.92	na	250	25	Yes
Residual Range Organics (RRO)	1,000	10	18	17	0.94	na	10,000	1,000	No
Residual Range Organics_Aromatic	137	53	6	6	1.0	na	3,000	300	No
TRPH	67	67	1	1	1.0	na	NA [g]	NA	No

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[b] COPC Screening Benchmark is equal to 1/10 the applicable regulatory critieria.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] This analyte is excluded as a COPC due to status as an essential nutrient.

[e] Screening Criteria for lead is based on residential cleanup value calculated according to Risk Assessment Procedures Manual guidance (18 AAC 75.340).

[f] Screening criteria is currently not available for dioxins and furans. These analytes are therefore carried through as COPCs.

Table E-33
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Sediment	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)

[g] TRPH is excluded as a COPC due to outdated analysis methods.

NA - Not applicable.

na - Not available.

nc - Not calculated.

BUTL - Background upper tolerance limit.

mg/kg - milligrams per kilogram.

COPC - Chemical of Potential Concern.

Table E-34
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Surface Water
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fresh Surface Water Data					BUTL (mg/L) [a]		Regulatory Criteria [b] (mg/L)	COPC Screening Benchmark [c] (mg/L)	COPC? (Yes/No)
	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water			
Inorganics, Total										
Aluminum	0.040	0.040	4	4	1.0	nc	2.2	0.087	0.0087	Yes
Barium	0.0050	0.0050	4	4	1.0	nc	0.034	2	0.2	Yes
Calcium	7.6	6.9	4	4	1.0	nc	nc	NA [d]	NA	No
Iron	0.38	0.31	4	4	1.0	nc	nc	NA [d]	NA	No
Magnesium	2.6	2.0	4	4	1.0	nc	nc	NA [d]	NA	No
Manganese	0.027	0.017	4	4	1.0	nc	0.12	na	na	Yes
Potassium	1.0	0.68	4	3	0.75	nc	nc	NA [d]	NA	No
Sodium	29	14	4	4	1.0	nc	nc	NA [d]	NA	No
Zinc	0.0080	0.0080	5	1	0.20	nc	0.90	11	1.1	Yes
Inorganics, Dissolved										
Silver, Dissolved	0.020	0.020	1	1	1.0	nc	nc	0.18	0.018	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	0.33	0.33	13	1	0.077	nc	nc	1.5	0.15	Yes
Diesel Range Organics_ Aliphatic	0.33	0.33	1	1	1.0	nc	nc	0.1	0.01	Yes
Gasoline Range Organics (GRO)	0.41	0.33	11	2	0.18	nc	nc	1.3	0.13	Yes

Notes:

BUTL - Background upper tolerance limit.

mg/L - Milligrams per liter.

NA - Not applicable.

na - Not available.

nc - Not calculated.

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Benchmark Criteria is equal to the minimum ADEC Groundwater Cleanup Level proposed by the two most recent guidance documents, below.
ADEC Groundwater Cleanup Levels Table C.

Table E-34
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Surface Water
Site 29
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L) [a]		Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Criteria [b] (mg/L)	Benchmark [c] (mg/L)	COPC? (Yes/No)

ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

ADEC Groundwater Cleanup Levels Table C.

ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[d] This analyte is excluded as a COPC due to status as an essential nutrient.

Table E-35
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Fish Tissue
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg) [a]	Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Fish Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Arsenic	0.78	0.50	8	8	1.0	nc	na	na	Yes
Barium	0.049	0.015	8	8	1.0	nc	na	na	Yes
Cadmium	0.009	0.0060	8	4	0.50	nc	na	na	Yes
Copper	0.98	0.55	8	8	1.0	nc	na	na	Yes
Lead	0.012	0.0030	8	5	0.63	nc	na	na	Yes
Mercury	0.022	0.014	8	8	1.0	nc	na	na	Yes
Nickel	0.10	0.030	8	3	0.38	nc	na	na	Yes
Selenium	0.17	0.12	8	8	1.0	nc	na	na	Yes
Vanadium	0.060	0.017	8	8	1.0	nc	na	na	Yes
Zinc	7.1	5.6	8	8	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.0065	<0.005	8	1	0.13	nc	na	na	Yes
Acenaphthene	0.0067	0.0013	8	2	0.25	nc	na	na	Yes
Anthracene	0.0072	0.0017	8	2	0.25	nc	na	na	Yes
Benzo(a)anthracene	0.0082	0.0014	8	2	0.25	nc	na	na	Yes
Benzo(a)pyrene	0.0059	0.0021	8	2	0.25	nc	na	na	Yes
Benzo(b)fluoranthene	0.004	0.0012	8	2	0.25	nc	na	na	Yes
Benzo(g,h,i)perylene	0.0064	0.0034	8	3	0.38	nc	na	na	Yes
Benzo(k)fluoranthene	0.012	0.0024	8	3	0.38	nc	na	na	Yes
Chrysene	0.0084	0.0025	8	2	0.25	nc	na	na	Yes
Dibenz(a,h)anthracene	0.0041	0.0041	8	1	0.13	nc	na	na	Yes
Fluoranthene	0.0093	0.0017	8	3	0.38	nc	na	na	Yes
Fluorene	0.0076	0.0012	8	3	0.38	nc	na	na	Yes
Indeno(1,2,3-cd)pyrene	0.0027	0.00074	8	3	0.38	nc	na	na	Yes
Naphthalene	0.0047	0.0018	8	3	0.38	nc	na	na	Yes
Phenanthrene	0.0086	0.0015	8	4	0.50	nc	na	na	Yes
Pyrene	0.010	0.0026	8	3	0.38	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	0.016	0.0061	8	8	1.0	nc	na	na	Yes
PCB-1260 (Aroclor 1260)	0.0045	<0.002	8	1	0.13	nc	na	na	Yes

Notes:

Table E-35
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Fish Tissue
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg) Maximum Detect	Fish Tissue Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Fish Tissue	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)

BUTL - Background upper tolerance limit.

COPC - Chemical of Potential Concern.

mg/kg - Milligrams per kilogram.

NA - Not applicable.

na - Not available.

nc - Not calculated.

PAH - Polynuclear Aromatic Hydrocarbons

PCB - Polychlorinated Biphenyls

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Benchmark Criterion is not currently available for this media.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-36
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Fish Tissue (Fillet Data Only)
Site 30
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg) [a]	Regulatory Criteria [b]	COPC Screening Benchmark [c]	COPC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Fish Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Arsenic	0.94	0.33	5	5	1.0	nc	na	na	Yes
Barium	0.061	0.024	5	5	1.0	nc	na	na	Yes
Cadmium	0.0080	0.0070	5	3	0.60	nc	na	na	Yes
Copper	1.2	0.59	5	5	1.0	nc	na	na	Yes
Lead	0.0040	0.0020	5	5	1.0	nc	na	na	Yes
Mercury	0.034	0.0090	5	5	1.0	nc	na	na	Yes
Nickel	0.050	0.030	5	4	0.80	nc	na	na	Yes
Selenium	0.19	0.13	5	5	1.0	nc	na	na	Yes
Vanadium	0.080	0.046	5	5	1.0	nc	na	na	Yes
Zinc	14	5.9	5	5	1.0	nc	na	na	Yes
PAHs									
Fluoranthene	0.0015	0.0015	5	1	0.200	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	0.011	0.0062	5	5	1.00	nc	na	na	Yes

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemical of Potential Concern.

mg/kg - Milligrams per kilogram.

NA - Not applicable.

na - Not available.

nc - Not calculated.

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Benchmark Criterion is not currently available for this media.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-37
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Plant Tissue
Site 30
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg) [a]	Regulatory Criteria[b]	COPC Screening Benchmark[c]	COPC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Plant Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Arsenic	0.56	<0.21	2	1	0.50	nc	na	na	Yes
Barium	21	12	2	2	1.0	nc	na	na	Yes
Cadmium	0.88	0.18	2	2	1.0	nc	na	na	Yes
Chromium	9.0	1.0	2	2	1.0	nc	na	na	Yes
Copper	2.8	2.2	2	2	1.0	nc	na	na	Yes
Lead	3.5	0.68	2	2	1.0	nc	na	na	Yes
Mercury	0.021	0.0080	2	2	1.0	nc	na	na	Yes
Nickel	4.2	1.1	2	2	1.0	nc	na	na	Yes
Selenium	0.050	0.050	2	1	0.50	nc	na	na	Yes
Silver	0.019	0.011	2	2	1.0	nc	na	na	Yes
Vanadium	3.6	0.36	2	2	1.0	nc	na	na	Yes
Zinc	57	28	2	2	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.0076	<0.005	2	1	0.50	nc	na	na	Yes
Acenaphthene	0.013	0.0037	2	2	1.0	nc	na	na	Yes
Anthracene	0.049	<0.005	2	1	0.50	nc	na	na	Yes
Benzo(a)anthracene	0.075	0.0025	2	2	1.00	nc	na	na	Yes
Benzo(a)pyrene	0.021	0.0027	2	2	1.00	nc	na	na	Yes
Benzo(b)fluoranthene	0.053	0.0045	2	2	1.0	nc	na	na	Yes
Benzo(g,h,i)perylene	0.013	0.0019	2	2	1.00	nc	na	na	Yes
Benzo(k)fluoranthene	0.046	0.0045	2	2	1.0	nc	na	na	Yes
Chrysene	0.087	0.0037	2	2	1.0	nc	na	na	Yes
Dibenz(a,h)anthracene	0.013	0.0019	2	2	1.00	nc	na	na	Yes
Fluoranthene	0.38	0.0083	2	2	1.0	nc	na	na	Yes
Fluorene	0.022	0.0025	2	2	1.0	nc	na	na	Yes
Indeno(1,2,3-cd)pyrene	0.024	0.0041	2	2	1.00	nc	na	na	Yes
Naphthalene	0.0078	0.0019	2	2	1.0	nc	na	na	Yes
Phenanthrene	0.29	0.013	2	2	1.0	nc	na	na	Yes
Pyrene	0.28	0.0073	2	2	1.0	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	0.011	0.0097	2	2	1.0	nc	na	na	Yes
PCB-1260 (Aroclor 1260)	0.0095	0.0050	2	2	1.0	nc	na	na	Yes

Table E-37
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Plant Tissue
Site 30
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg) Maximum Detect	Plant Tissue Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Plant Tissue	Regulatory Criteria[b] (mg/kg)	COPC Screening Benchmark[c] (mg/kg)	COPC? (Yes/No)

Notes:

BUTL - Background upper tolerance limit.

COPC - Chemical of Potential Concern.

mg/kg - Milligrams per kilogram.

na - Not available.

nc - Not calculated.

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Benchmark Criterion is not currently available for this media.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-38
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 31
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Tundra Data: Maximum Detect (mg/kg)	Soil Tundra Data: Minimum Detect (mg/kg)	Soil Tundra Data: Number of Samples	Soil Tundra Data: Number of Detects	Soil Tundra Data: Detection Frequency	BUTL (mg/kg) [a]: Soil Tundra	BUTL (mg/kg) [a]: Soil Gravel	Regulatory Criteria [b] (mg/kg)	COPC Screening Benchmark [c] (mg/kg)	COPC? (Yes/No)
VOCs										
m,p-Xylene	0.017	0.0066	4	2	0.50	nc	nc	na	na	Yes
o-Xylene	0.0053	0.0053	4	1	0.25	nc	nc	na	na	Yes
Toluene	0.024	0.0073	4	3	0.75	nc	nc	5.4	0.54	No
PCBs										
PCB-1260 (Aroclor 1260)	22	0.36	8	6	0.75	nc	nc	10	1	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	11,000	11	24	24	1.0	nc	nc	250	25	Yes
Residual Range Organics (RRO)	9,600	12	24	12	0.50	nc	nc	10,000	1,000	Yes

Notes:
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PCB - Polychlorinated Biphenyls
VOC - Volatile Organic Compounds

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:
1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

Table E-38
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 31
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-39
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 32
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) [a] Soil Tundra	BUTL (mg/kg) [a] Soil Gravel	Criteria [b] (mg/kg)	Benchmark [c] (mg/kg)	COPC? (Yes/No)
PCBs										
PCB-1260 (Aroclor 1260)	0.89	0.16	3	2	0.67	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	13,000	230	5	5	1.0	nc	nc	250	25	Yes
Residual Range Organics (RRO)	3,600	1,100	5	3	0.60	nc	nc	10,000	1,000	Yes

Notes:
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PCB - Polychlorinated Biphenyls

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-40
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 33
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg) [a]		Criteria [b]	Benchmark [c]	COPC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	660	150	3	3	1.0	na	na	250	25	Yes
Residual Range Organics (RRO)	2,100	270	3	3	1.0	na	na	10,000	1,000	Yes

Notes:
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

Table E-41
Selection of Chemicals of Potential Concern for the Tier I Human Health Screening - Soil
Site 34
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Regulatory	COPC Screening	
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Soil Tundra	BUTL (mg/kg) Soil Gravel	Criteria[a] (mg/kg)	Benchmark[b] (mg/kg)	COPC? (Yes/No)
PCBs										
PCB-1254 (Aroclor 1254)	0.59	0.050	8	5	0.63	nc	nc	10	1	No
PCB-1260 (Aroclor 1260)	0.47	0.063	8	4	0.50	nc	nc	10	1	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	1,100	13	9	9	1.0	nc	nc	250	25	Yes
Residual Range Organics (RRO)	1,200	58	9	8	0.89	nc	nc	10,000	1,000	Yes

Notes:
na - Not applicable.
nc - Not calculated.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
COPC - Chemical of Potential Concern
PCB - Polychlorinated Biphenyls

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Regulatory Criteria is equal to the minimum ADEC Soil Cleanup Level proposed by the following hierarchy:

1. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2003. 18 AAC 75 Oil and Hazardous Substances Pollution Control. January 30.
2. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Oil and Other Hazardous Substances Pollution Control. Public Comment Draft. 18 AAC 75. December 14.
3. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2002. Cumulative Risk Guidance. November 7.
4. Minimum of 3 pathways listed in Tables B1 and B2, Under 40 inch zone: ADEC, 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules - Technical Memorandum 01-007. December 18.

[c] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

APPENDIX F

Human Health Tier 2 Baseline Risk Calculations

TABLE F-1

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 3 - Fuel Line Corridor and Pumphouse - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0093	3.7E-09	0.0E+00	2.7E-13	7.5E-03	7.5E-03	1.6E-03	2.8E-11	0.0E+00	4.5E-16	2.8E-11
										ILCR	**3E-11**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-2

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 3 - Fule Line Corridor and Pumphouse - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0093	1.1E-08	0.0E+00	8.2E-13	7.5E-03	7.5E-03	1.6E-03	8.4E-11	0.0E+00	1.4E-15	8.4E-11
										ILCR	**8E-11**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-3

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 3 - Fuel Line Corridor and Pumphouse - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOCs											
Methylene chloride	0.0093	9.1E-11	0.0E+00	2.8E-14	7.5E-03	7.5E-03	1.6E-03	6.8E-13	0.0E+00	4.6E-17	6.8E-13
										ILCR	**7E-13**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-4

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 3 - Fuel Line Corridor - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	119	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0093	3.4E-08	0.0E+00	1.7E-12	6.0E-02	6.0E-02	8.6E-01	5.6E-07	0.0E+00	2.0E-12	0.00000056
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	51	1.8E-04	7.6E-05	9.2E-09	2.0E-02	2.0E-02	8.6E-04	9.2E-03	3.8E-03	1.1E-05	0.013
										HI	**0.013**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	2,587	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	2,070	7.5E-03	Inc	3.7E-07	1.0E-01	na	2.9E-01	7.5E-02	Inc	1.3E-06	0.08
Diesel Range Organics, Aromatic	1,035	3.8E-03	Inc	1.9E-07	4.0E-02	na	5.7E-01	9.4E-02	Inc	3.3E-07	0.1
										HI	**0.17**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.
effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-5

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 3 - Fuel Line Corridor and Pumphouse - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	119	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOCs											
Methylene chloride	0.0093	1.0E-07	0.0E+00	5.0E-12	6.0E-02	6.0E-02	8.6E-01	1.7E-06	0.0E+00	5.9E-12	0.0000017
PAHs											
Naphthalene	51	5.6E-04	2.3E-04	2.8E-08	2.0E-02	2.0E-02	8.6E-04	2.8E-02	1.1E-02	3.2E-05	0.039
										HI	**0.039**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	2,587	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	2,070	2.3E-02	Inc	1.1E-06	1.0E-01	na	2.9E-01	2.3E-01	Inc	3.9E-06	0.2
Diesel Range Organics, Aromatic	1,035	1.1E-02	Inc	5.6E-07	4.0E-02	na	5.7E-01	2.8E-01	Inc	9.8E-07	0.3
										HI	**0.51**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-6

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 3 - Fuel Line Corridor and Pumphouse - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	119	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0093	2.7E-10	0.0E+00	8.2E-14	6.0E-02	6.0E-02	8.6E-01	4.4E-09	0.0E+00	9.5E-14	0.000000004
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	51	1.5E-06	2.5E-06	4.5E-10	2.0E-02	2.0E-02	8.6E-04	7.3E-05	1.2E-04	5.2E-07	0.0002
										HI	**0.00020**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	2,587	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	2,070	5.9E-05	Inc	1.8E-08	1.0E-01	na	2.9E-01	5.9E-04	Inc	6.3E-08	0.0006
Diesel Range Organics, Aromatic	1,035	3.0E-05	Inc	9.1E-09	4.0E-02	na	5.7E-01	7.4E-04	Inc	1.6E-08	0.0007
										HI	**0.0013**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-7

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 3 - Fuel Line Corridor and Pumphouse - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	14	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	11	9.5E-02	Inc	6.3E-02	1.0E-01	na	2.9E-01	9.5E-01	Inc	2.2E-01	1.2
Diesel Range Organics, Aromatic	5.6	4.7E-02	Inc	3.2E-02	4.0E-02	na	5.7E-01	1.2E+00	Inc	5.5E-02	1.2
Residual Range Organics	8.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7.3	6.2E-02	Inc	4.3E-05	2.0E+00	na	na	3.1E-02	Inc	Inc	0.031
Residual Range Organics, Aromatic	2.4	2.1E-02	Inc	1.4E-05	3.0E-02	na	na	6.8E-01	Inc	Inc	0.68
										HI	**3.1**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-8

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 3 - Fuel Line Corridor and Pumphouse - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	14	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	11	3.7E-01	Inc	2.5E-01	1.0E-01	na	2.9E-01	3.7E+00	Inc	8.5E-01	4.5
Diesel Range Organics, Aromatic	5.6	1.8E-01	Inc	1.2E-01	4.0E-02	na	5.7E-01	4.6E+00	Inc	2.2E-01	4.8
Residual Range Organics	8.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7.3	2.4E-01	Inc	1.7E-04	2.0E+00	na	na	1.2E-01	Inc	na	0.12
Residual Range Organics, Aromatic	2.4	8.0E-02	Inc	5.5E-05	3.0E-02	na	na	2.7E+00	Inc	na	2.7
										HI	**12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-9

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 3 - Fuel Line Corridor and Pumphouse - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	14	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	11.2	1.3E-02	Inc	3.1E-03	1.0E-01	na	2.9E-01	1.3E-01	Inc	1.1E-02	0.14
Diesel Range Organics, Aromatic	5.6	6.4E-03	Inc	1.5E-03	4.0E-02	na	5.7E-01	1.6E-01	Inc	2.7E-03	0.16
Residual Range Organics	8.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7.3	8.3E-03	Inc	2.1E-06	2.0E+00	na	na	4.2E-03	Inc	Inc	0.0042
Residual Range Organics, Aromatic	2.4	2.8E-03	Inc	6.9E-07	3.0E-02	na	na	9.2E-02	Inc	Inc	0.092
										HI	**0.40**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-10

NONCANCER HAZARD CALCULATIONS FOR A CURRENT SEASONAL RESIDENT
SITE 4 - Subsistence Fish and Hunting Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	160	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
										HI	**0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	5,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	4,240	1.5E-02	Inc	7.7E-07	1.0E-01	na	2.9E-01	1.5E-01	Inc	2.6E-06	0.15
Diesel Range Organics, Aromatic	2,120	7.7E-03	Inc	3.8E-07	4.0E-02	na	5.7E-01	1.9E-01	Inc	6.7E-07	0.19
Residual Range Organics	3,420	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,078	1.1E-02	Inc	5.6E-07	2.0E+00	na	na	5.6E-03	Inc	Inc	0.006
Residual Range Organics, Aromatic	1,026	3.7E-03	Inc	1.9E-07	3.0E-02	na	na	1.2E-01	Inc	Inc	0.12
										HI	**0.48**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-11

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 4 - Subsistence Fish and Hunting Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	160	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
										HI	**0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	5,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	4,240	1.5E-02	Inc	7.7E-07	1.0E-01	na	2.9E-01	1.5E-01	Inc	2.6E-06	0.15
Diesel Range Organics, Aromatic	2,120	7.7E-03	Inc	3.8E-07	4.0E-02	na	5.7E-01	1.9E-01	Inc	6.7E-07	0.19
Residual Range Organics	3,420	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,078	1.1E-02	Inc	5.6E-07	2.0E+00	na	na	5.6E-03	Inc	Inc	0.0056
Residual Range Organics, Aromatic	1,026	3.7E-03	Inc	1.9E-07	3.0E-02	na	na	1.2E-01	Inc	Inc	0.12
										HI	**0.48**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-12

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 4 - Subsistence Fishing and Hunting Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	160	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
										HI	**0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	5,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	4,240	4.6E-02	Inc	2.3E-06	1.0E-01	na	2.9E-01	4.6E-01	Inc	7.9E-06	0.5
Diesel Range Organics, Aromatic	2,120	2.3E-02	Inc	1.1E-06	4.0E-02	na	5.7E-01	5.8E-01	Inc	2.0E-06	0.6
Residual Range Organics	3,420	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,078	3.4E-02	Inc	1.7E-06	2.0E+00	na	na	1.7E-02	Inc	Inc	0.017
Residual Range Organics, Aromatic	1,026	1.1E-02	Inc	5.6E-07	3.0E-02	na	na	3.7E-01	Inc	Inc	0.37
										HI	**1.4**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-13

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 4 - Subsistence Fishing and Hunting Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	160	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
										HI	**0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	5,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	4,240	1.2E-04	Inc	3.7E-08	1.0E-01	na	2.9E-01	1.2E-03	Inc	1.3E-07	0.0012
Diesel Range Organics, Aromatic	2,120	6.1E-05	Inc	1.9E-08	4.0E-02	na	5.7E-01	1.5E-03	Inc	3.3E-08	0.0015
Residual Range Organics	3,420	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,078	8.8E-05	Inc	2.7E-08	2.0E+00	na	na	4.4E-05	Inc	Inc	4.4E-05
Residual Range Organics, Aromatic	1,026	2.9E-05	Inc	9.0E-09	3.0E-02	na	na	9.8E-04	Inc	Inc	0.00098
										HI	**0.0037**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-14

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 4 - Subsistence Fishing and Hunting Camp - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3.0	2.5E-02	Inc	1.7E-02	1.0E-01	na	2.9E-01	2.5E-01	Inc	5.8E-02	0.31
Diesel Range Organics, Aromatic	1.5	1.3E-02	Inc	8.3E-03	4.0E-02	na	5.7E-01	3.1E-01	Inc	1.5E-02	0.33
Residual Range Organics	6.5	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	5.9	4.9E-02	Inc	3.4E-05	2.0E+00	na	na	2.5E-02	Inc	na	0.025
Residual Range Organics, Aromatic	2.0	1.6E-02	Inc	1.1E-05	3.0E-02	na	na	5.5E-01	Inc	na	0.55
										HI	**1.2**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-15

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 4 - Subsistence Fish and Hunting Camp - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3.0	9.7E-02	Inc	6.5E-02	1.0E-01	na	2.9E-01	9.7E-01	Inc	2.2E-01	1.2
Diesel Range Organics, Aromatic	1.5	4.9E-02	Inc	3.2E-02	4.0E-02	na	5.7E-01	1.2E+00	Inc	5.7E-02	1.3
Residual Range Organics	6.5	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	4.6	1.5E-01	Inc	1.0E-04	5.0E+00	na	na	3.0E-02	Inc	na	0.030
Residual Range Organics, Aromatic	3.3	1.1E-01	Inc	7.4E-05	2.0E-01	na	na	5.3E-01	Inc	na	0.53
										HI	**3.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-16

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 4 - Subsistence Fish and Hunting Camp - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3.0	3.4E-03	Inc	8.1E-04	1.0E-01	na	2.9E-01	3.4E-02	Inc	1.2E-02	0.045
Diesel Range Organics, Aromatic	1.5	1.7E-03	Inc	4.1E-04	4.0E-02	na	5.7E-01	4.2E-02	Inc	3.0E-03	0.045
Residual Range Organics	6.5	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	5.9	6.7E-03	Inc	1.7E-06	2.0E+00	na	na	3.3E-03	Inc	na	0.0033
Residual Range Organics, Aromatic	2.0	2.2E-03	Inc	5.6E-07	3.0E-02	na	na	7.4E-02	Inc	Inc	0.074
										HI	**0.17**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-17

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Beryllium	1.3	5.2E-07	0.0E+00	3.8E-11	na	na	8.4E+00	na	na	3.2E-10	3.2E-10
Cobalt	5.1	2.1E-06	0.0E+00	1.5E-10	na	na	9.8E+00	na	na	1.5E-09	1.5E-09
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0079	3.2E-09	0.0E+00	2.3E-13	7.5E-03	7.5E-03	1.6E-03	2.4E-11	0.0E+00	3.8E-16	2.4E-11
										ILCR	**2E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-18

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Beryllium	1.3	1.6E-06	0.0E+00	1.1E-10	na	na	8.4E+00	na	na	9.6E-10	9.6E-10
Cobalt	5.1	6.2E-06	0.0E+00	4.5E-10	na	na	9.8E+00	na	na	4.4E-09	4.4E-09
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0079	9.5E-09	0.0E+00	7.0E-13	7.5E-03	7.5E-03	1.6E-03	7.2E-11	0.0E+00	1.1E-15	7.2E-11
										ILCR	**5E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-19

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Beryllium	1.3	1.3E-08	0.0E+00	3.9E-12	na	na	8.4E+00	na	na	3.3E-11	3.3E-11
Cobalt	5.1	5.0E-08	0.0E+00	1.5E-11	na	na	9.8E+00	na	na	1.5E-10	1.5E-10
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0079	7.7E-11	0.0E+00	2.4E-14	7.5E-03	7.5E-03	1.6E-03	5.8E-13	0.0E+00	3.9E-17	5.8E-13
										ILCR	**2E-10**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-20

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 6 - Cargo Beach Drum Field - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	9,850	3.6E-02	0.0E+00	1.8E-06	1.0E+00	1.0E+00	1.4E-03	3.6E-02	0.0E+00	1.3E-03	0.037
Beryllium	1.3	4.7E-06	0.0E+00	2.3E-10	2.0E-03	2.0E-03	5.7E-06	2.4E-03	0.0E+00	4.1E-05	0.0024
Cobalt	5.1	1.9E-05	0.0E+00	9.2E-10	2.0E-02	2.0E-02	5.7E-06	9.3E-04	0.0E+00	1.6E-04	0.0011
Manganese	164	6.0E-04	0.0E+00	3.0E-08	1.4E-01	1.4E-01	1.4E-05	4.3E-03	0.0E+00	2.1E-03	0.0064
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.044	1.6E-07	0.0E+00	7.9E-12	2.0E-01	2.0E-01	2.9E-02	8.0E-07	0.0E+00	2.7E-10	0.0000008
Methylene chloride	0.0079	2.9E-08	0.0E+00	1.4E-12	6.0E-02	6.0E-02	8.6E-01	4.8E-07	0.0E+00	1.7E-12	0.00000048
o-Xylene	0.014	5.1E-08	0.0E+00	2.5E-12	2.0E-01	2.0E-01	2.9E-02	2.5E-07	0.0E+00	8.7E-11	0.00000025
										HI	**0.047**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	102,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	81,600	3.0E-01	Inc	1.5E-05	1.0E-01	na	2.9E-01	3.0E+00	Inc	5.1E-05	3.0
Diesel Range Organics, Aromatic	40,800	1.5E-01	Inc	7.4E-06	4.0E-02	na	5.7E-01	3.7E+00	Inc	1.3E-05	3.7
Residual Range Organics	8,500	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7,650	2.8E-02	Inc	1.4E-06	2.0E+00	na	na	1.4E-02	Inc	Inc	0.014
Residual Range Organics, Aromatic	2550	9.3E-03	Inc	4.6E-07	3.0E-02	na	na	3.1E-01	Inc	Inc	0.31
										HI	**7.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-21

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	9,850	1.1E-01	0.0E+00	5.3E-06	1.0E+00	1.0E+00	1.4E-03	1.1E-01	0.0E+00	3.8E-03	0.11
Beryllium	1.3	1.4E-05	0.0E+00	7.0E-10	2.0E-03	2.0E-03	5.7E-06	7.1E-03	0.0E+00	1.2E-04	0.0072
Cobalt	5.1	5.6E-05	0.0E+00	2.8E-09	2.0E-02	2.0E-02	5.7E-06	2.8E-03	0.0E+00	4.8E-04	0.0033
Manganese	164	1.8E-03	0.0E+00	8.9E-08	1.4E-01	1.4E-01	1.4E-05	1.3E-02	0.0E+00	6.3E-03	0.019
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.044	4.8E-07	0.0E+00	2.4E-11	2.0E-01	2.0E-01	2.9E-02	2.4E-06	0.0E+00	8.2E-10	0.0000024
Methylene chloride	0.0079	8.6E-08	0.0E+00	4.3E-12	6.0E-02	6.0E-02	8.6E-01	1.4E-06	0.0E+00	5.0E-12	0.0000014
o-Xylene	0.014	1.5E-07	0.0E+00	7.6E-12	2.0E-01	2.0E-01	2.9E-02	7.6E-07	0.0E+00	2.6E-10	0.00000076
										HI	**0.14**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	102,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	81,600	8.9E-01	Inc	4.4E-05	1.0E-01	na	2.9E-01	8.9E+00	Inc	1.5E-04	8.9
Diesel Range Organics, Aromatic	40,800	4.5E-01	Inc	2.2E-05	4.0E-02	na	5.7E-01	1.1E+01	Inc	3.9E-05	11
Residual Range Organics	8,500	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7,650	8.4E-02	Inc	4.1E-06	2.0E+00	na	na	4.2E-02	Inc	Inc	0.042
Residual Range Organics, Aromatic	2,550	2.8E-02	Inc	1.4E-06	3.0E-02	na	na	9.3E-01	Inc	Inc	0.93
										HI	**21**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-21

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

of a medium.

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-22

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	9,850	2.8E-04	0.0E+00	8.6E-08	1.0E+00	1.0E+00	1.4E-03	2.8E-04	0.0E+00	6.2E-05	0.00034
Beryllium	1.3	3.7E-08	0.0E+00	1.1E-11	2.0E-03	2.0E-03	5.7E-06	1.9E-05	0.0E+00	2.0E-06	0.000021
Cobalt	5.1	1.5E-07	0.0E+00	4.5E-11	2.0E-02	2.0E-02	5.7E-06	7.3E-06	0.0E+00	7.9E-06	0.000015
Manganese	164	4.7E-06	0.0E+00	1.4E-09	1.4E-01	1.4E-01	1.4E-05	3.3E-05	0.0E+00	1.0E-04	0.00014
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.044	1.3E-09	0.0E+00	3.9E-13	2.0E-01	2.0E-01	2.9E-02	6.3E-09	0.0E+00	1.3E-11	0.0000000063
Methylene chloride	0.0079	2.3E-10	0.0E+00	6.9E-14	6.0E-02	6.0E-02	8.6E-01	3.8E-09	0.0E+00	8.1E-14	0.0000000038
o-Xylene	0.014	4.0E-10	0.0E+00	1.2E-13	2.0E-01	2.0E-01	2.9E-02	2.0E-09	0.0E+00	4.2E-12	0.0000000020
										HI	**0.00051**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	102,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	81,600	2.3E-03	Inc	7.2E-07	1.0E-01	na	2.9E-01	2.3E-02	Inc	2.5E-06	0.023
Diesel Range Organics, Aromatic	40,800	1.2E-03	Inc	3.6E-07	4.0E-02	na	5.7E-01	2.9E-02	Inc	6.3E-07	0.029
Residual Range Organics	8,500	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	7,650	2.2E-04	Inc	6.7E-08	2.0E+00	na	na	1.1E-04	Inc	Inc	0.00011
Residual Range Organics, Aromatic	2,550	7.3E-05	Inc	2.2E-08	3.0E-02	na	na	2.4E-03	Inc	Inc	0.0024
										HI	**0.055**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-22

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 6 - Cargo Beach Road Drumfield - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-23

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	15	6.0E-06	7.1E-07	4.4E-10	1.5E+00	1.5E+00	1.5E+01	9.1E-06	1.1E-06	6.6E-09	1.0E-05
Cadmium	3.4	1.4E-06	5.4E-09	1.0E-10	na	na	6.3E+00	na	na	6.3E-10	6.3E-10
Cobalt	19	7.6E-06	0.0E+00	5.6E-10	na	na	9.8E+00	na	na	5.5E-09	5.5E-09
VOLATILE ORGANIC COMPOUNDS											
Bromoethane	0.18	7.2E-08	0.0E+00	5.3E-12	2.9E-03	2.9E-03	2.9E-03	2.1E-10	0.0E+00	1.5E-14	2.1E-10
Methylene chloride	0.13	5.2E-08	0.0E+00	3.8E-12	7.5E-03	7.5E-03	1.6E-03	3.9E-10	0.0E+00	6.3E-15	3.9E-10
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	6.4E-07	3.6E-07	4.7E-11	2.0E+00	2.0E+00	2.0E+00	1.3E-06	7.1E-07	9.4E-11	2.0E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000043	1.7E-11	2.0E-12	1.3E-15	1.5E+05	1.5E+05	1.5E+05	2.6E-06	3.1E-07	1.9E-10	2.9E-06
										ILCR	**2E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-24

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	15	1.8E-05	2.1E-06	1.3E-09	1.5E+00	1.5E+00	1.5E+01	2.7E-05	3.2E-06	2.0E-08	3.0E-05
Cadmium	3.4	4.1E-06	1.6E-08	3.0E-10	na	na	6.3E+00	na	na	1.9E-09	1.9E-09
Cobalt	19	2.3E-05	0.0E+00	1.7E-09	na	na	9.8E+00	na	na	1.6E-08	1.6E-08
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	1.9E-06	1.1E-06	1.4E-10	2.0E+00	2.0E+00	2.0E+00	3.9E-06	2.1E-06	2.8E-10	6.0E-06
VOLATILE ORGANIC COMPOUNDS											
Bromoethane	0.18	2.2E-07	0.0E+00	1.6E-11	2.9E-03	2.9E-03	2.9E-03	6.4E-10	0.0E+00	4.7E-14	6.4E-10
Methylene chloride	0.13	1.6E-07	0.0E+00	1.1E-11	7.5E-03	7.5E-03	1.6E-03	1.2E-09	0.0E+00	1.8E-14	1.2E-09
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000043	5.2E-11	6.1E-12	3.8E-15	1.5E+05	1.5E+05	1.5E+05	7.8E-06	9.2E-07	5.7E-10	8.7E-06
										ILCR	**5E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-25

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	15	1.5E-07	5.8E-08	4.5E-11	1.5E+00	1.5E+00	1.5E+01	2.2E-07	8.7E-08	6.8E-10	3.1E-07
Cadmium	3.4	3.3E-08	4.4E-10	1.0E-11	na	na	6.3E+00	na	na	6.4E-11	6.4E-11
Cobalt	19	1.9E-07	0.0E+00	5.7E-11	na	na	9.8E+00	na	na	5.6E-10	5.6E-10
VOLATILE ORGANIC COMPOUNDS											
Bromoethane	0.18	1.8E-09	0.0E+00	5.4E-13	2.9E-03	2.9E-03	2.9E-03	5.1E-12	0.0E+00	1.6E-15	5.1E-12
Methylene chloride	0.13	1.3E-09	0.0E+00	3.9E-13	7.5E-03	7.5E-03	1.6E-03	9.5E-12	0.0E+00	6.4E-16	9.5E-12
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	1.6E-08	2.9E-08	4.8E-12	2.0E+00	2.0E+00	2.0E+00	3.1E-08	5.8E-08	9.6E-12	8.9E-08
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000043	4.2E-13	1.7E-13	1.3E-16	1.5E+05	1.5E+05	1.5E+05	6.3E-08	2.5E-08	1.9E-11	8.8E-08
										ILCR	**5E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-26

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	12,000	4.4E-02	0.0E+00	2.2E-06	1.0E+00	1.0E+00	1.4E-03	4.4E-02	0.0E+00	1.5E-03	0.045
Arsenic	15	5.3E-05	5.1E-06	2.7E-09	3.0E-04	3.0E-04	3.0E-04	1.8E-01	1.7E-02	8.8E-06	0.19
Cadmium	3.4	1.2E-05	3.9E-08	6.1E-10	5.0E-04	5.0E-04	5.0E-04	2.5E-02	7.8E-05	1.2E-06	0.025
Chromium	43	1.6E-04	0.0E+00	7.8E-09	1.5E+00	1.5E+00	1.5E+00	1.0E-04	0.0E+00	5.2E-09	0.00010
Cobalt	19	6.9E-05	0.0E+00	3.4E-09	2.0E-02	2.0E-02	5.7E-06	3.5E-03	0.0E+00	6.0E-04	0.0041
Lead	196	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	662	2.4E-03	0.0E+00	1.2E-07	1.4E-01	1.4E-01	1.4E-05	1.7E-02	0.0E+00	8.5E-03	0.026
Mercury	0.31	1.1E-06	0.0E+00	5.6E-11	3.0E-04	3.0E-04	3.0E-04	3.8E-03	0.0E+00	1.9E-07	0.0038
Nickel	50	1.8E-04	0.0E+00	9.0E-09	2.0E-02	2.0E-02	2.0E-02	9.0E-03	0.0E+00	4.5E-07	0.0090
Thallium	1.2	4.4E-06	0.0E+00	2.2E-10	7.0E-05	7.0E-05	7.0E-06	6.2E-02	0.0E+00	3.1E-05	0.062
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.28	1.0E-06	0.0E+00	5.1E-11	2.8E-01	2.8E-01	6.3E-01	3.6E-06	0.0E+00	8.0E-11	0.0000036
Acetone	1.4	5.1E-06	0.0E+00	2.5E-10	9.0E-01	9.0E-01	9.0E-01	5.7E-06	0.0E+00	2.8E-10	0.0000057
Bromoethane	0.18	6.6E-07	0.0E+00	3.3E-11	4.0E-01	4.0E-01	2.9E+00	1.6E-06	0.0E+00	1.1E-11	0.0000016
m,p-Xylene	0.066	2.4E-07	0.0E+00	1.2E-11	2.0E-01	2.0E-01	2.9E-01	1.2E-06	0.0E+00	4.1E-11	0.0000012
Methylene chloride	0.13	4.7E-07	0.0E+00	2.3E-11	6.0E-02	6.0E-02	8.6E-01	7.9E-06	0.0E+00	2.7E-11	0.000008
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Methylphenol (p-Cresol)	4	1.4E-05	4.5E-06	7.0E-10	5.0E-03	5.0E-03	5.0E-03	2.8E-03	9.0E-04	1.4E-07	0.0037
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	5.8E-06	2.6E-06	2.9E-10	2.0E-05	2.0E-05	2.0E-05	2.9E-01	1.3E-01	1.4E-05	0.42
										HI	**0.79**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	32,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	25,600	9.3E-02	Inc	4.6E-06	1.0E-01	na	2.9E-01	9.3E-01	Inc	1.6E-05	0.93
Diesel Range Organics, Aromatic	12,800	4.7E-02	Inc	2.3E-06	4.0E-02	na	5.7E-01	1.2E+00	Inc	4.1E-06	1.2
Residual Range Organics	3,448	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,104	1.1E-02	Inc	5.6E-07	2.0E+00	na	na	5.6E-03	Inc	Inc	0.0056
Residual Range Organics, Aromatic	1,035	3.8E-03	Inc	1.9E-07	3.0E-02	na	na	1.3E-01	Inc	Inc	0.13
										HI	**2.2**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

HI Hazard index.
HQ Hazard quotient.
Inc Incomplete pathway.

TABLE F-26

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-27

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	12,000	1.3E-01	0.0E+00	6.5E-06	1.0E+00	1.0E+00	1.4E-03	1.3E-01	0.0E+00	4.6E-03	0.14
Arsenic	15	1.6E-04	1.6E-05	8.1E-09	3.0E-04	3.0E-04	3.0E-04	5.5E-01	5.2E-02	2.7E-05	0.60
Cadmium	3.4	3.7E-05	1.2E-07	1.8E-09	5.0E-04	5.0E-04	5.0E-04	7.4E-02	2.4E-04	3.7E-06	0.074
Chromium	43	4.7E-04	0.0E+00	2.3E-08	1.5E+00	1.5E+00	1.5E+00	3.1E-04	0.0E+00	1.6E-08	0.00031
Cobalt	19	2.1E-04	0.0E+00	1.0E-08	2.0E-02	2.0E-02	5.7E-06	1.0E-02	0.0E+00	1.8E-03	0.012
Lead	196	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	662	7.2E-03	0.0E+00	3.6E-07	1.4E-01	1.4E-01	1.4E-05	5.2E-02	0.0E+00	2.6E-02	0.077
Mercury	0.31	3.4E-06	0.0E+00	1.7E-10	3.0E-04	3.0E-04	3.0E-04	1.1E-02	0.0E+00	5.6E-07	0.011
Nickel	50	5.5E-04	0.0E+00	2.7E-08	2.0E-02	2.0E-02	2.0E-02	2.7E-02	0.0E+00	1.4E-06	0.027
Thallium	1.2	1.3E-05	0.0E+00	6.5E-10	7.0E-05	7.0E-05	7.0E-05	1.9E-01	0.0E+00	9.3E-06	0.19
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.28	3.1E-06	0.0E+00	1.5E-10	2.8E-01	2.8E-01	6.3E-01	1.1E-05	0.0E+00	2.4E-10	0.000011
Acetone	1.4	1.5E-05	0.0E+00	7.6E-10	9.0E-01	9.0E-01	9.0E-01	1.7E-05	0.0E+00	8.4E-10	0.000017
Bromoethane	0.18	2.0E-06	0.0E+00	9.8E-11	4.0E-01	4.0E-01	2.9E+00	4.9E-06	0.0E+00	3.4E-11	0.0000049
m,p-Xylene	0.066	7.2E-07	0.0E+00	3.6E-11	2.0E-01	2.0E-01	2.9E-02	3.6E-06	0.0E+00	1.2E-09	0.0000036
Methylene chloride	0.13	1.4E-06	0.0E+00	7.0E-11	6.0E-02	6.0E-02	8.6E-01	2.4E-05	0.0E+00	8.2E-11	0.000024
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Methylphenol (p-Cresol)	3.9	4.3E-05	1.3E-05	2.1E-09	5.0E-03	5.0E-03	5.0E-03	8.5E-03	2.7E-03	4.2E-07	0.011
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	1.7E-05	7.7E-06	8.7E-10	2.0E-05	2.0E-05	2.0E-05	8.7E-01	3.9E-01	4.3E-05	1.3
										HI	**2.4**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	32,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	25,600	2.8E-01	Inc	1.4E-05	1.0E-01	na	2.9E-01	2.8E+00	Inc	4.8E-05	2.8
Diesel Range Organics, Aromatic	12,800	1.4E-01	Inc	6.9E-06	4.0E-02	na	5.7E-01	3.5E+00	Inc	1.2E-05	3.5
Residual Range Organics	3,448	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,103	3.4E-02	Inc	1.7E-06	2.0E+00	na	na	1.7E-02	Inc	Inc	0.017
Residual Range Organics, Aromatic	1,034	1.1E-02	Inc	5.6E-07	3.0E-02	na	na	3.8E-01	Inc	Inc	0.38
										HI	**6.7**

Notes:

TABLE F-27

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-28

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	12,000	3.4E-04	0.0E+00	1.1E-07	1.0E+00	1.0E+00	1.4E-03	3.4E-04	0.0E+00	7.5E-05	0.00042
Arsenic	15	4.3E-07	1.7E-07	1.3E-10	3.0E-04	3.0E-04	3.0E-04	1.4E-03	5.7E-04	4.4E-07	0.0020
Cadmium	3.4	9.7E-08	1.3E-09	3.0E-11	5.0E-04	5.0E-04	5.0E-04	1.9E-04	2.6E-06	6.0E-08	0.00020
Chromium	43	1.2E-06	0.0E+00	3.8E-10	1.5E+00	1.5E+00	1.5E+00	8.2E-07	0.0E+00	2.5E-10	0.00000082
Cobalt	19	5.4E-07	0.0E+00	1.7E-10	2.0E-02	2.0E-02	2.0E-02	2.7E-05	0.0E+00	8.3E-09	0.000027
Lead	196	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	662	1.9E-05	0.0E+00	5.8E-09	1.4E-01	1.4E-01	1.4E-05	1.3E-04	0.0E+00	4.2E-04	0.00055
Mercury	0.31	8.8E-09	0.0E+00	2.7E-12	3.0E-04	3.0E-04	3.0E-04	2.9E-05	0.0E+00	9.1E-09	0.000029
Nickel	50	1.4E-06	0.0E+00	4.4E-10	2.0E-02	2.0E-02	2.0E-02	7.1E-05	0.0E+00	2.2E-08	0.000071
Thallium	1.2	3.4E-08	0.0E+00	1.1E-11	7.0E-05	7.0E-05	7.0E-05	4.9E-04	0.0E+00	1.5E-07	0.00049
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.28	8.0E-09	0.0E+00	2.5E-12	2.8E-01	2.8E-01	6.3E-01	2.9E-08	0.0E+00	3.9E-12	0.000000029
Acetone	1.4	4.0E-08	0.0E+00	1.2E-11	9.0E-01	9.0E-01	9.0E-01	4.4E-08	0.0E+00	1.4E-11	0.000000044
Bromoethane	0.18	5.1E-09	0.0E+00	1.6E-12	4.0E-01	4.0E-01	2.9E+00	1.3E-08	0.0E+00	5.5E-13	0.000000013
m,p-Xylene	0.066	1.9E-09	0.0E+00	5.8E-13	2.0E-01	2.0E-01	2.9E-02	9.4E-09	0.0E+00	2.0E-11	0.0000000094
Methylene chloride	0.13	3.7E-09	0.0E+00	1.1E-12	6.0E-02	6.0E-02	8.6E-01	6.2E-08	0.0E+00	1.3E-12	0.000000062
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Methylphenol (p-Cresol)	3.9	1.1E-07	1.5E-07	3.4E-11	5.0E-03	5.0E-03	5.0E-03	2.2E-05	2.9E-05	6.8E-09	0.000052
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	1.6	4.6E-08	8.4E-08	1.4E-11	2.0E-05	2.0E-05	2.0E-05	2.3E-03	4.2E-03	7.0E-07	0.0065
										HI	**0.010**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	32,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	25,600	7.3E-04	Inc	2.2E-07	1.0E-01	na	2.9E-01	7.3E-03	Inc	7.8E-07	0.0073
Diesel Range Organics, Aromatic	12,800	3.7E-04	Inc	1.1E-07	4.0E-02	na	5.7E-01	9.1E-03	Inc	2.0E-07	0.0091
Residual Range Organics	3,448	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,103	8.9E-05	Inc	2.7E-08	2.0E+00	na	na	4.4E-05	Inc	Inc	0.000044
Residual Range Organics, Aromatic	1,034	3.0E-05	Inc	9.1E-09	3.0E-02	na	na	9.8E-04	Inc	Inc	0.00098
										HI	**0.017**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

HI Hazard index.

HQ Hazard quotient.

Inc Incomplete pathway.

TABLE F-28

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-29

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.064	2.4E-04	1.3E-06	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	8.0E-06	2.3E-06	2.4E-05	5.5E-02	5.5E-02	2.7E-02	4.4E-07	1.3E-07	6.5E-07	1.2E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000000000023	8.8E-14	9.7E-13	Inc	1.5E+05	1.5E+05	1.5E+05	1.3E-08	1.5E-07	Inc	1.6E-07
										ILCR	**1E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-30

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.064	9.5E-04	2.7E-04	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	3.1E-05	8.8E-06	9.4E-05	5.5E-02	5.5E-02	2.7E-02	1.7E-06	4.9E-07	2.5E-06	4.7E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000000000023	3.4E-13	3.8E-12	Inc	1.5E+05	1.5E+05	1.5E+05	5.1E-08	5.7E-07	Inc	6.2E-07
										ILCR	**5E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-31

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.064	2.5E-05	5.2E-06	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	8.2E-07	1.7E-07	9.4E-05	5.5E-02	5.5E-02	2.7E-02	4.5E-08	9.4E-09	2.5E-06	2.6E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.000000000023	9.0E-15	7.3E-14	Inc	1.5E+05	1.5E+05	1.5E+05	1.3E-09	1.1E-08	Inc	1.2E-08
										ILCR	**3E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-32

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	26	2.2E-01	1.0E-02	Inc	1.0E+00	1.0E+00	1.4E-03	2.2E-01	1.0E-02	Inc	0.23
Barium	0.13	1.1E-03	5.2E-05	Inc	7.0E-04	7.0E-04	1.4E-04	1.6E+00	7.4E-02	Inc	1.6
Cobalt	0.064	5.4E-04	1.0E-05	Inc	2.0E-02	2.0E-02	5.7E-06	2.7E-02	5.1E-04	Inc	0.028
Lead, Dissolved	0.040	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.59	5.0E-03	2.4E-04	Inc	1.4E-01	1.4E-01	1.4E-05	3.6E-02	1.7E-03	Inc	0.037
Nickel	3.5	3.0E-02	2.8E-04	Inc	2.0E-02	2.0E-02	2.0E-02	1.5E+00	1.4E-02	Inc	1.5
Zinc	2.5	2.1E-02	1.0E-03	Inc	3.0E-01	3.0E-01	3.0E-01	7.0E-02	3.3E-03	Inc	0.074
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	1.8E-05	1.7E-05	1.5E-04	4.0E-03	4.0E-03	8.6E-03	4.4E-03	4.3E-03	1.7E-02	0.026
										HI	**3.5**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	0.66	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.53	4.5E-03	Inc	3.0E-03	1.0E-01	na	2.9E-01	4.5E-02	Inc	1.0E-02	0.055
Diesel Range Organics, Aromatic	0.26	2.2E-03	Inc	1.5E-03	4.0E-02	na	5.7E-01	5.6E-02	Inc	2.6E-03	0.058
Residual Range Organics	2.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	2.4	2.1E-02	Inc	1.4E-05	2.0E+00	na	na	1.0E-02	Inc	Inc	0.010
Residual Range Organics, Aromatic	0.8	6.8E-03	Inc	4.8E-06	3.0E-02	na	na	2.3E-01	Inc	Inc	0.23
										HI	**0.35**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-32

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)
by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic
hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-33

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	26	8.5E-01	4.0E-02	Inc	1.0E+00	1.0E+00	1.4E-03	8.5E-01	4.0E-02	Inc	0.89
Barium	0.13	4.3E-03	2.0E-04	Inc	7.0E-04	7.0E-04	1.4E-04	6.1E+00	2.9E-01	Inc	6.4
Cobalt	0.064	2.1E-03	4.0E-05	Inc	2.0E-02	2.0E-02	5.7E-06	1.1E-01	2.0E-03	Inc	0.11
Lead, Dissolved	0.040	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.59	1.9E-02	9.2E-04	Inc	1.4E-01	1.4E-01	1.4E-05	1.4E-01	6.6E-03	Inc	0.15
Nickel	3.5	1.2E-01	1.1E-03	Inc	2.0E-02	2.0E-02	2.0E-02	5.8E+00	5.4E-02	Inc	5.8
Zinc	2.5	8.2E-02	3.9E-03	Inc	3.0E-01	3.0E-01	3.0E-01	2.7E-01	1.3E-02	Inc	0.29
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	6.9E-05	6.7E-05	9.4E-05	4.0E-03	4.0E-03	8.6E-03	1.7E-02	1.7E-02	1.1E-02	0.045
										HI	**14**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	0.66	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.53	1.7E-02	Inc	1.2E-02	1.0E-01	na	2.9E-01	1.7E-01	Inc	4.0E-02	0.21
Diesel Range Organics, Aromatic	0.26	8.7E-03	Inc	5.8E-03	4.0E-02	na	5.7E-01	2.2E-01	Inc	1.0E-02	0.23
Residual Range Organics	2.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	2.4	8.0E-02	Inc	5.5E-05	2.0E+00	na	na	4.0E-02	Inc	Inc	0.040
Residual Range Organics, Aromatic	0.81	2.7E-02	Inc	1.8E-05	3.0E-02	na	na	8.9E-01	Inc	Inc	0.89
										HI	**1.4**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-33

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)
by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic
hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-34

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	26	2.9E-02	2.9E-04	Inc	1.0E+00	1.0E+00	1.4E-03	2.9E-02	2.9E-04	Inc	0.030
Barium	0.13	1.5E-04	1.5E-06	Inc	7.0E-04	7.0E-04	1.4E-04	2.1E-01	2.1E-03	Inc	0.21
Cobalt	0.064	7.3E-05	2.9E-07	Inc	2.0E-02	2.0E-02	5.7E-06	3.7E-03	1.5E-05	Inc	0.0037
Lead, Dissolved	0.04	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.593	6.8E-04	6.8E-06	Inc	1.4E-01	1.4E-01	1.4E-05	4.8E-03	4.8E-05	Inc	0.0049
Nickel	3.5	4.0E-03	8.0E-06	Inc	2.0E-02	2.0E-02	2.0E-02	2.0E-01	4.0E-04	Inc	0.20
Zinc	2.5	2.9E-03	2.9E-05	Inc	3.0E-01	3.0E-01	3.0E-01	9.5E-03	9.5E-05	Inc	0.0096
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.0021	2.4E-06	5.0E-07	7.2E-06	4.0E-03	4.0E-03	8.6E-03	6.0E-04	1.2E-04	8.4E-04	0.0016
										HI	**0.46**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	0.66	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.53	6.0E-04	Inc	1.4E-04	1.0E-01	na	2.9E-01	6.0E-03	Inc	5.0E-04	0.0065
Diesel Range Organics, Aromatic	0.26	3.0E-04	Inc	7.2E-05	4.0E-02	na	5.7E-01	7.5E-03	Inc	1.3E-04	0.0077
Residual Range Organics	2.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	2.4	2.8E-03	Inc	6.9E-07	2.0E+00	na	na	1.4E-03	Inc	Inc	0.0014
Residual Range Organics, Aromatic	0.8	9.2E-04	Inc	2.3E-07	3.0E-02	na	na	3.1E-02	Inc	Inc	0.031
										HI	**0.046**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-34

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 7 - Cargo Beach Road Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-35

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	17	6.7E-06	7.9E-07	4.9E-10	1.5E+00	1.5E+00	1.5E+01	1.0E-05	1.2E-06	7.3E-09	1.1E-05
Cadmium	4.1	1.6E-06	6.5E-09	1.2E-10	na	na	6.3E+00	na	na	7.6E-10	7.6E-10
Cobalt	38	1.5E-05	0.0E+00	1.1E-09	na	na	9.8E+00	na	na	1.1E-08	1.1E-08
VOLATILE ORGANIC COMPOUNDS											
1,2-Dibromoethane	0.000010	4.0E-12	0.0E+00	2.9E-16	8.5E-01	8.5E-01	7.7E-01	3.4E-12	0.0E+00	2.3E-16	3.4E-12
1,3-Dichloropropane	0.000097	3.9E-11	0.0E+00	2.9E-15	6.8E-02	6.8E-02	6.8E-02	2.7E-12	0.0E+00	1.9E-16	2.7E-12
2,2-Dichloropropane	0.00000092	3.7E-13	0.0E+00	2.7E-17	6.8E-02	6.8E-02	6.8E-02	2.5E-14	0.0E+00	1.8E-18	2.5E-14
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000085	3.4E-12	4.0E-13	2.5E-16	1.5E+05	1.5E+05	1.5E+05	5.1E-07	6.1E-08	3.7E-11	5.7E-07
										ILCR	**1E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-36

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	17	2.0E-05	2.4E-06	1.5E-09	1.5E+00	1.5E+00	1.5E+01	3.0E-05	3.6E-06	2.2E-08	3.4E-05
Cadmium	4.1	4.9E-06	1.9E-08	3.6E-10	na	na	6.3E+00	na	na	2.3E-09	2.3E-09
Cobalt	38	4.6E-05	0.0E+00	3.4E-09	na	na	9.8E+00	na	na	3.3E-08	3.3E-08
VOLATILE ORGANIC COMPOUNDS											
1,2-Dibromoethane	0.000010	1.2E-11	0.0E+00	8.8E-16	8.5E-01	8.5E-01	7.7E-01	1.0E-11	0.0E+00	6.8E-16	1.0E-11
1,3-Dichloropropane	0.00010	1.2E-10	0.0E+00	8.6E-15	6.8E-02	6.8E-02	6.8E-02	8.0E-12	0.0E+00	5.8E-16	8.0E-12
2,2-Dichloropropane	0.00000092	1.1E-12	0.0E+00	8.1E-17	6.8E-02	6.8E-02	6.8E-02	7.5E-14	0.0E+00	5.5E-18	7.5E-14
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000085	1.0E-11	1.2E-12	7.5E-16	1.5E+05	1.5E+05	1.5E+05	1.5E-06	1.8E-07	1.1E-10	1.7E-06
								ILCR			**4E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-37

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	17	1.6E-07	6.4E-08	5.0E-11	1.5E+00	1.5E+00	1.5E+01	2.4E-07	9.6E-08	7.5E-10	3.4E-07
Cadmium	4.1	4.0E-08	5.3E-10	1.2E-11	na	na	6.3E+00	na	na	7.7E-11	7.7E-11
Cobalt	38	3.7E-07	0.0E+00	1.1E-10	na	na	9.8E+00	na	na	1.1E-09	1.1E-09
VOLATILE ORGANIC COMPOUNDS											
1,2-Dibromoethane	0.000010	9.8E-14	0.0E+00	3.0E-17	8.5E-01	8.5E-01	7.7E-01	8.3E-14	0.0E+00	2.3E-17	8.3E-14
1,3-Dichloropropane	0.000097	9.5E-13	0.0E+00	2.9E-16	6.8E-02	6.8E-02	6.8E-02	6.5E-14	0.0E+00	2.0E-17	6.5E-14
2,2-Dichloropropane	0.00000092	9.0E-15	0.0E+00	2.8E-18	6.8E-02	6.8E-02	6.8E-02	6.1E-16	0.0E+00	1.9E-19	6.1E-16
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000085	8.3E-14	3.3E-14	2.6E-17	1.5E+05	1.5E+05	1.5E+05	1.2E-08	4.9E-09	3.8E-12	1.7E-08
										ILCR	**4E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-38

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	0.0000036	1.3E-11	0.0E+00	6.5E-16	1.0E+00	1.0E+00	1.4E-03	1.3E-11	0.0E+00	4.6E-13	0.000000000014
Antimony	14	4.9E-05	0.0E+00	2.4E-09	4.0E-04	4.0E-04	4.0E-04	1.2E-01	0.0E+00	6.1E-06	0.12
Arsenic	17	6.0E-05	5.7E-06	3.0E-09	3.0E-04	3.0E-04	3.0E-04	2.0E-01	1.9E-02	1.0E-05	0.22
Cadmium	4.1	1.5E-05	4.7E-08	7.4E-10	5.0E-04	5.0E-04	5.0E-04	3.0E-02	9.4E-05	1.5E-06	0.030
Chromium	29	1.1E-04	0.0E+00	5.3E-09	1.5E+00	1.5E+00	1.5E+00	7.1E-05	0.0E+00	3.5E-09	0.000071
Cobalt	38	1.4E-04	0.0E+00	6.9E-09	2.0E-02	2.0E-02	5.7E-06	6.9E-03	0.0E+00	1.2E-03	0.0081
Copper	98	3.6E-04	0.0E+00	1.8E-08	3.7E-02	3.7E-02	3.7E-02	9.7E-03	0.0E+00	4.8E-07	0.010
Lead	276	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	970	3.5E-03	0.0E+00	1.8E-07	1.4E-01	1.4E-01	1.4E-05	2.5E-02	0.0E+00	1.3E-02	0.038
Mercury	0.21	7.7E-07	0.0E+00	3.8E-11	3.0E-04	3.0E-04	3.0E-04	2.6E-03	0.0E+00	1.3E-07	0.0026
Nickel	27	9.9E-05	0.0E+00	4.9E-09	2.0E-02	2.0E-02	2.0E-02	4.9E-03	0.0E+00	2.4E-07	0.0049
Selenium	1.0	3.6E-06	0.0E+00	1.8E-10	5.0E-03	5.0E-03	5.0E-03	7.3E-04	0.0E+00	3.6E-08	0.00073
Thallium	0.28	1.0E-06	0.0E+00	5.1E-11	7.0E-05	7.0E-05	7.0E-05	1.5E-02	0.0E+00	7.2E-07	0.015
Zinc	459	1.7E-03	0.0E+00	8.3E-08	3.0E-01	3.0E-01	3.0E-01	5.6E-03	0.0E+00	2.8E-07	0.0056
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.14	5.2E-07	0.0E+00	2.6E-11	2.8E-01	2.8E-01	6.3E-01	1.9E-06	0.0E+00	4.1E-11	0.0000019
1,2-Dibromoethane	0.000010	3.6E-11	0.0E+00	1.8E-15	5.7E-05	5.7E-05	5.7E-05	6.4E-07	0.0E+00	3.2E-11	0.00000064
1,3-Dichlorobenzene	0.062	2.3E-07	0.0E+00	1.1E-11	9.0E-04	9.0E-04	9.0E-04	2.5E-04	0.0E+00	1.2E-08	0.00025
1,3-Dichloropropane	0.000097	3.5E-10	0.0E+00	1.8E-14	1.1E-03	1.1E-03	1.1E-03	3.2E-07	0.0E+00	1.6E-11	0.00000032
2,2-Dichloropropane	0.00000092	3.3E-12	0.0E+00	1.7E-16	1.1E-03	1.1E-03	1.1E-03	3.0E-09	0.0E+00	1.5E-13	0.0000000030
2-Chlorotoluene	0.0000045	1.6E-11	0.0E+00	8.1E-16	2.0E-02	2.0E-02	2.0E-02	8.2E-10	0.0E+00	4.1E-14	0.00000000082
2-Chloroethyl vinyl ether	0.0000026	9.5E-12	0.0E+00	4.7E-16	na	na	na	na	na	na	0
2-Hexanone	0.0000087	3.2E-11	0.0E+00	1.6E-15	8.0E-02	8.0E-02	2.3E-02	4.0E-10	0.0E+00	6.8E-14	0.00000000040
4-Bromophenyl phenyl ether	0.0000024	8.7E-12	0.0E+00	4.3E-16	na	na	na	na	na	na	0
4-Chlorophenyl phenyl ether	0.0000029	1.1E-11	0.0E+00	5.2E-16	na	na	na	na	na	na	0
4-Isopropyltoluene	0.0000047	1.7E-11	0.0E+00	8.5E-16	1.0E-01	1.0E-01	1.0E-01	1.7E-10	0.0E+00	8.5E-15	0.00000000017
Bromomethane	0.36	1.3E-06	0.0E+00	6.5E-11	1.4E-03	1.4E-03	1.4E-03	9.4E-04	0.0E+00	4.6E-08	0.00094
Toluene	1.1	4.0E-06	0.0E+00	2.0E-10	2.0E-01	2.0E-01	1.1E-01	2.0E-05	0.0E+00	1.8E-09	0.000020
SEMIVOLATILE ORGANIC COMPOUNDS											
3-Nitroaniline	0.0000019	6.9E-12	2.2E-12	3.4E-16	2.9E-05	2.9E-05	2.9E-05	2.4E-07	7.6E-08	1.2E-11	0.00000031
4-Chlorotoluene	0.025	8.9E-08	2.8E-08	4.4E-12	2.0E-02	2.0E-02	2.0E-02	4.5E-06	1.4E-06	2.2E-10	0.0000059
4-Nitroaniline	0.000030	1.1E-10	3.4E-11	5.4E-15	2.9E-05	2.9E-05	2.9E-05	3.7E-06	1.2E-06	1.9E-10	0.0000049
4-Nitrophenol	0.00013	4.8E-10	1.5E-10	2.4E-14	5.0E-04	5.0E-04	5.7E-04	9.7E-07	3.1E-07	4.2E-11	0.0000013
2-Methyl-4,6-dinitrophenol	0.0000037	1.3E-11	4.3E-12	6.7E-16	5.0E-04	5.0E-04	5.7E-04	2.7E-08	8.5E-09	1.2E-12	0.000000035
										HI	**0.46**

TABLE F-38

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	462	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	370	1.3E-03	Inc	6.7E-08	1.0E-01	na	2.9E-01	1.3E-02	Inc	2.3E-07	0.013
Diesel Range Organics, Aromatic	185	6.7E-04	Inc	3.3E-08	4.0E-02	na	5.7E-01	1.7E-02	Inc	5.9E-08	0.017
Residual Range Organics	1,539	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,385	5.0E-03	Inc	2.5E-07	2.0E+00	na	na	2.5E-03	Inc	Inc	0.0025
Residual Range Organics, Aromatic	462	1.7E-03	Inc	8.3E-08	3.0E-02	na	na	5.6E-02	Inc	Inc	0.056
										HI	**0.089**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-39

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	0.0000036	3.9E-11	0.0E+00	2.0E-15	1.0E+00	1.0E+00	1.4E-03	3.9E-11	0.0E+00	1.4E-12	0.000000000041
Antimony	14	1.5E-04	0.0E+00	7.3E-09	4.0E-04	4.0E-04	4.0E-04	3.7E-01	0.0E+00	1.8E-05	0.37
Arsenic	17	1.8E-04	1.7E-05	9.0E-09	3.0E-04	3.0E-04	3.0E-04	6.0E-01	5.7E-02	3.0E-05	0.66
Cadmium	4.1	4.5E-05	1.4E-07	2.2E-09	5.0E-04	5.0E-04	5.0E-04	8.9E-02	2.8E-04	4.4E-06	0.089
Chromium	29	3.2E-04	0.0E+00	1.6E-08	1.5E+00	1.5E+00	1.5E+00	2.1E-04	0.0E+00	1.1E-08	0.00021
Cobalt	38	4.1E-04	0.0E+00	2.1E-08	2.0E-02	2.0E-02	5.7E-06	2.1E-02	0.0E+00	3.6E-03	0.024
Copper	98	1.1E-03	0.0E+00	5.3E-08	3.7E-02	3.7E-02	3.7E-02	2.9E-02	0.0E+00	1.4E-06	0.029
Lead	276	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	970	1.1E-02	0.0E+00	5.3E-07	1.4E-01	1.4E-01	1.4E-05	7.6E-02	0.0E+00	3.8E-02	0.113
Mercury	0.21	2.3E-06	0.0E+00	1.1E-10	3.0E-04	3.0E-04	3.0E-04	7.7E-03	0.0E+00	3.8E-07	0.0077
Nickel	27	3.0E-04	0.0E+00	1.5E-08	2.0E-02	2.0E-02	2.0E-02	1.5E-02	0.0E+00	7.3E-07	0.015
Selenium	1.0	1.1E-05	0.0E+00	5.4E-10	5.0E-03	5.0E-03	5.0E-03	2.2E-03	0.0E+00	1.1E-07	0.0022
Thallium	0.28	3.1E-06	0.0E+00	1.5E-10	7.0E-05	7.0E-05	7.0E-05	4.4E-02	0.0E+00	2.2E-06	0.044
Zinc	459	5.0E-03	0.0E+00	2.5E-07	3.0E-01	3.0E-01	3.0E-01	1.7E-02	0.0E+00	8.3E-07	0.017
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.14	1.6E-06	0.0E+00	7.7E-11	2.8E-01	2.8E-01	6.3E-01	5.6E-06	0.0E+00	1.2E-10	0.0000056
1,2-Dibromoethane	0.00001	1.1E-10	0.0E+00	5.4E-15	5.7E-05	5.7E-05	5.7E-05	1.9E-06	0.0E+00	9.5E-11	0.0000019
1,3-Dichlorobenzene	0.068	7.4E-07	0.0E+00	3.7E-11	9.0E-04	9.0E-04	9.0E-04	8.3E-04	0.0E+00	4.1E-08	0.00083
1,3-Dichloropropane	0.000097	1.1E-09	0.0E+00	5.3E-14	1.1E-03	1.1E-03	1.1E-03	9.6E-07	0.0E+00	4.8E-11	0.00000096
2,2-Dichloropropane	0.00000092	1.0E-11	0.0E+00	5.0E-16	1.1E-03	1.1E-03	1.1E-03	9.1E-09	0.0E+00	4.5E-13	0.0000000091
2-Chlorotoluene	0.0000045	4.9E-11	0.0E+00	2.4E-15	2.0E-02	2.0E-02	2.0E-02	2.5E-09	0.0E+00	1.2E-13	0.0000000025
2-Chloroethyl vinyl ether	0.0000026	2.8E-11	0.0E+00	1.4E-15	na	na	na	na	na	na	0
2-Hexanone	0.0000087	9.5E-11	0.0E+00	4.7E-15	8.0E-02	8.0E-02	2.3E-02	1.2E-09	0.0E+00	2.0E-13	0.0000000012
4-Bromophenyl phenyl ether	0.0000024	2.6E-11	0.0E+00	1.3E-15	na	na	na	na	na	na	0
4-Chlorophenyl phenyl ether	0.0000029	3.2E-11	0.0E+00	1.6E-15	na	na	na	na	na	na	0
4-Isopropyltoluene	0.0000047	5.1E-11	0.0E+00	2.5E-15	1.0E-01	1.0E-01	1.0E-01	5.1E-10	0.0E+00	2.5E-14	0.00000000051
Bromomethane	0.36	3.9E-06	0.0E+00	2.0E-10	1.4E-03	1.4E-03	1.4E-03	2.8E-03	0.0E+00	1.4E-07	0.0028
Toluene	1.1	1.2E-05	0.0E+00	6.0E-10	2.0E-01	2.0E-01	1.1E-01	6.0E-05	0.0E+00	5.4E-09	0.000060
SEMIVOLATILE ORGANIC COMPOUNDS											
3-Nitroaniline	0.0000019	2.1E-11	6.6E-12	1.0E-15	2.9E-05	2.9E-05	2.9E-05	7.2E-07	2.3E-07	3.6E-11	0.00000094
4-Chlorotoluene	0.025	2.7E-07	8.5E-08	1.3E-11	2.0E-02	2.0E-02	2.0E-02	1.3E-05	4.2E-06	6.6E-10	0.000018
4-Nitroaniline	0.000030	3.2E-10	1.0E-10	1.6E-14	2.9E-05	2.9E-05	2.9E-05	1.1E-05	3.5E-06	5.6E-10	0.000015
4-Nitrophenol	0.00013	1.5E-09	4.6E-10	7.2E-14	5.0E-04	5.0E-04	5.7E-04	2.9E-06	9.2E-07	1.3E-10	0.0000038

TABLE F-39

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
2-Methyl-4,6-dinitrophenol	0.0000037	4.0E-11	1.3E-11	2.0E-15	5.0E-04	5.0E-04	5.7E-04	8.1E-08	2.6E-08	3.5E-12	0.00000011
										HI	**1.4**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	462	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	370	4.0E-03	Inc	2.0E-07	1.0E-01	na	2.9E-01	4.0E-02	Inc	6.9E-07	0.040
Diesel Range Organics, Aromatic	185	2.0E-03	Inc	1.0E-07	4.0E-02	na	5.7E-01	5.0E-02	Inc	1.8E-07	0.050
Residual Range Organics	1,539	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,385	1.5E-02	Inc	7.5E-07	2.0E+00	na	na	7.6E-03	Inc	Inc	0.0076
Residual Range Organics, Aromatic	462	5.0E-03	Inc	2.5E-07	3.0E-02	na	na	1.7E-01	Inc	Inc	0.17
										HI	**0.27**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-40

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	0.0000036	1.0E-13	0.0E+00	3.2E-17	1.0E+00	1.0E+00	1.4E-03	1.0E-13	0.0E+00	2.3E-14	0.00000000000013
Antimony	14	3.9E-07	0.0E+00	1.2E-10	4.0E-04	4.0E-04	4.0E-04	9.6E-04	0.0E+00	3.0E-07	0.0010
Arsenic	17	4.7E-07	1.9E-07	1.5E-10	3.0E-04	3.0E-04	3.0E-04	1.6E-03	6.3E-04	4.9E-07	0.0022
Cadmium	4.1	1.2E-07	1.5E-09	3.6E-11	5.0E-04	5.0E-04	5.0E-04	2.3E-04	3.1E-06	7.2E-08	0.00024
Chromium	29	8.4E-07	0.0E+00	2.6E-10	1.5E+00	1.5E+00	1.5E+00	5.6E-07	0.0E+00	1.7E-10	0.00000056
Cobalt	38	1.1E-06	0.0E+00	3.3E-10	2.0E-02	2.0E-02	5.7E-06	5.4E-05	0.0E+00	5.9E-05	0.00011
Copper	98	2.8E-06	0.0E+00	8.6E-10	3.7E-02	3.7E-02	3.7E-02	7.6E-05	0.0E+00	2.3E-08	0.000076
Lead	276	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	970	2.8E-05	0.0E+00	8.5E-09	1.4E-01	1.4E-01	1.4E-05	2.0E-04	0.0E+00	6.1E-04	0.00081
Mercury	0.21	6.0E-09	0.0E+00	1.9E-12	3.0E-04	3.0E-04	3.0E-04	2.0E-05	0.0E+00	6.2E-09	0.000020
Nickel	27	7.7E-07	0.0E+00	2.4E-10	2.0E-02	2.0E-02	2.0E-02	3.9E-05	0.0E+00	1.2E-08	0.000039
Selenium	1.0	2.9E-08	0.0E+00	8.8E-12	5.0E-03	5.0E-03	5.0E-03	5.7E-06	0.0E+00	1.8E-09	0.0000057
Thallium	0.28	8.0E-09	0.0E+00	2.5E-12	7.0E-05	7.0E-05	7.0E-05	1.1E-04	0.0E+00	3.5E-08	0.00011
Zinc	459	1.3E-05	0.0E+00	4.0E-09	3.0E-01	3.0E-01	3.0E-01	4.4E-05	0.0E+00	1.3E-08	0.000044
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	0.14	4.1E-09	0.0E+00	1.3E-12	2.8E-01	2.8E-01	6.3E-01	1.5E-08	0.0E+00	2.0E-12	0.000000015
1,2-Dibromoethane	0.000010	2.9E-13	0.0E+00	8.8E-17	5.7E-05	5.7E-05	5.7E-05	5.0E-09	0.0E+00	1.5E-12	0.0000000050
1,3-Dichlorobenzene	0.068	1.9E-09	0.0E+00	6.0E-13	9.0E-04	9.0E-04	9.0E-04	2.2E-06	0.0E+00	6.6E-10	0.0000022
1,3-Dichloropropane	0.000097	2.8E-12	0.0E+00	8.5E-16	1.1E-03	1.1E-03	1.1E-03	2.5E-09	0.0E+00	7.7E-13	0.0000000025
2,2-Dichloropropane	0.00000092	2.6E-14	0.0E+00	8.0E-18	1.1E-03	1.1E-03	1.1E-03	2.4E-11	0.0E+00	7.3E-15	0.000000000024
2-Chlorotoluene	0.0000045	1.3E-13	0.0E+00	4.0E-17	2.0E-02	2.0E-02	2.0E-02	6.4E-12	0.0E+00	2.0E-15	0.0000000000064
2-Chloroethyl vinyl ether	0.0000026	7.4E-14	0.0E+00	2.3E-17	na	na	na	na	na	na	0
2-Hexanone	0.0000087	2.5E-13	0.0E+00	7.6E-17	8.0E-02	8.0E-02	2.3E-02	3.1E-12	0.0E+00	3.3E-15	0.0000000000031
4-Bromophenyl phenyl ether	0.0000024	6.8E-14	0.0E+00	2.1E-17	na	na	na	na	na	na	0.0
4-Chlorophenyl phenyl ether	0.0000029	8.3E-14	0.0E+00	2.5E-17	na	na	na	na	na	na	0.0
4-Isopropyltoluene	0.0000047	1.3E-13	0.0E+00	4.1E-17	1.0E-01	1.0E-01	1.0E-01	1.3E-12	0.0E+00	4.1E-16	0.0000000000013
Bromomethane	0.36	1.0E-08	0.0E+00	3.2E-12	1.4E-03	1.4E-03	1.4E-03	7.3E-06	0.0E+00	2.3E-09	0.0000073
Toluene	1.1	3.1E-08	0.0E+00	9.7E-12	2.0E-01	2.0E-01	1.1E-01	1.6E-07	0.0E+00	8.8E-11	0.00000016
SEMIVOLATILE ORGANIC COMPOUNDS											
3-Nitroaniline	0.0000019	5.4E-14	7.2E-14	1.7E-17	2.9E-05	2.9E-05	2.9E-05	1.9E-09	2.5E-09	5.8E-13	0.0000000043
4-Chlorotoluene	0.025	7.0E-10	9.2E-10	2.2E-13	2.0E-02	2.0E-02	2.0E-02	3.5E-08	4.6E-08	1.1E-11	0.000000081
4-Nitroaniline	0.000030	8.5E-13	1.1E-12	2.6E-16	2.9E-05	2.9E-05	2.9E-05	2.9E-08	3.9E-08	9.0E-12	0.000000068
4-Nitrophenol	0.00013	3.8E-12	5.0E-12	1.2E-15	5.0E-04	5.0E-04	5.7E-04	7.6E-09	1.0E-08	2.0E-12	0.000000018
2-Methyl-4,6-dinitrophenol	0.0000037	1.1E-13	1.4E-13	3.2E-17	5.0E-04	5.0E-04	5.7E-04	2.1E-10	2.8E-10	5.7E-14	0.00000000049
										HI	**0.0046**

TABLE F-40

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	462	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	370	1.1E-05	Inc	3.2E-09	1.0E-01	na	2.9E-01	1.1E-04	Inc	1.1E-08	0.00011
Diesel Range Organics, Aromatic	185	5.3E-06	Inc	1.6E-09	4.0E-02	na	5.7E-01	1.3E-04	Inc	2.8E-09	0.00013
Residual Range Organics	1,539	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,385	4.0E-05	Inc	1.2E-08	2.0E+00	na	na	2.0E-05	Inc	Inc	0.000020
Residual Range Organics, Aromatic	462	1.3E-05	Inc	4.1E-09	3.0E-02	na	na	4.4E-04	Inc	Inc	0.00044
										HI	**0.00070**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-41

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.037	1.4E-04	7.7E-07	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	2.9E-06	8.1E-07	8.6E-05	5.5E-02	5.5E-02	2.7E-02	1.6E-07	4.4E-08	2.3E-06	2.5E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000000054	2.1E-11	3.9E-10	Inc	1.5E+05	1.5E+05	1.5E+05	3.1E-06	5.9E-05	Inc	6.2E-05
										ILCR	**6E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-42

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.037	5.5E-04	3.0E-06	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	1.1E-05	3.1E-06	3.3E-05	5.5E-02	5.5E-02	2.7E-02	6.1E-07	1.7E-07	9.0E-07	1.7E-06
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000000054	8.0E-11	1.5E-09	Inc	1.5E+05	1.5E+05	1.5E+05	1.2E-05	2.3E-04	Inc	2.4E-04
										ILCR	**2E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-43

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Cobalt	0.037	1.4E-05	5.8E-08	Inc	na	na	9.8E+00	na	na	Inc	0.0E+00
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	2.9E-07	6.0E-08	8.8E-07	5.5E-02	5.5E-02	2.7E-02	1.6E-08	3.3E-09	3.2E-05	3.2E-05
DIOXINS/FURANS											
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD) Toxicity Equivalents (TEQ)	0.0000000054	2.1E-12	2.9E-11	Inc	1.5E+05	1.5E+05	1.5E+05	3.2E-07	4.4E-06	Inc	4.7E-06
										ILCR	**4E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-44

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	164	1.4E+00	6.5E-02	Inc	1.0E+00	1.0E+00	1.4E-03	1.4E+00	6.5E-02	Inc	1.5
Antimony	0.12	1.0E-03	4.8E-05	Inc	4.0E-04	4.0E-04	4.0E-04	2.5E+00	1.2E-01	Inc	2.7
Barium	1.2	9.8E-03	4.6E-04	Inc	7.0E-02	7.0E-02	1.4E-04	1.4E-01	6.6E-03	Inc	0.15
Cobalt	0.037	3.1E-04	5.9E-06	Inc	2.0E-02	2.0E-02	5.7E-06	1.6E-02	3.0E-04	Inc	0.016
Lead, Dissolved	0.30	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	2.2	1.9E-02	8.9E-04	Inc	1.4E-01	1.4E-01	1.4E-05	1.4E-01	6.4E-03	Inc	0.14
Nickel	0.091	7.7E-04	7.3E-06	Inc	2.0E-02	2.0E-02	2.0E-02	3.8E-02	3.6E-04	Inc	0.039
Vanadium	0.15	1.3E-03	5.9E-05	Inc	7.0E-03	7.0E-03	7.0E-03	1.8E-01	8.5E-03	Inc	0.19
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	6.3E-06	6.2E-06	5.3E-05	4.0E-03	4.0E-03	8.6E-03	1.6E-03	1.5E-03	6.1E-03	0.0092
										HI	**4.6**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	7.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6.2	5.2E-02	Inc	3.5E-02	1.0E-01	na	2.9E-01	5.2E-01	Inc	1.2E-01	0.64
Diesel Range Organics, Aromatic	3.1	2.6E-02	Inc	1.7E-02	4.0E-02	na	5.7E-01	6.5E-01	Inc	3.0E-02	0.68
Gasoline Range Organics	4.2	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.9	2.5E-02	Inc	1.7E-05	5.0E+00	na	5.3E+00	5.0E-03	Inc	3.3E-06	0.0050
Gasoline Range Organics, Aromatic	2.1	1.8E-02	Inc	1.2E-05	2.0E-01	na	1.1E-01	8.9E-02	Inc	1.1E-04	0.089
										HI	**1.4**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-44

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-45

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	164	5.4E+00	2.5E-01	Inc	1.0E+00	1.0E+00	1.4E-03	5.4E+00	2.5E-01	Inc	5.6
Antimony	0.12	3.9E-03	1.9E-04	Inc	4.0E-04	4.0E-04	4.0E-04	9.9E+00	4.7E-01	Inc	10
Barium	1.2	3.8E-02	1.8E-03	Inc	7.0E-02	7.0E-02	1.4E-04	5.4E-01	2.6E-02	Inc	0.57
Cobalt	0.037	1.2E-03	2.3E-05	Inc	2.0E-02	2.0E-02	5.7E-06	6.1E-02	1.1E-03	Inc	0.062
Lead, Dissolved	0.30	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	2.2	7.4E-02	3.5E-03	Inc	1.4E-01	1.4E-01	1.4E-05	5.3E-01	2.5E-02	Inc	0.55
Nickel	0.091	3.0E-03	2.8E-05	Inc	2.0E-02	2.0E-02	2.0E-02	1.5E-01	1.4E-03	Inc	0.15
Vanadium	0.15	4.9E-03	2.3E-04	Inc	7.0E-03	7.0E-03	7.0E-03	7.0E-01	3.3E-02	Inc	0.73
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	2.5E-05	2.4E-05	3.3E-05	4.0E-03	4.0E-03	8.6E-03	6.1E-03	6.0E-03	3.9E-03	0.016
										HI	**18**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	7.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6.2	2.0E-01	Inc	1.4E-01	1.0E-01	na	2.9E-01	2.0E+00	Inc	4.7E-01	2.5
Diesel Range Organics, Aromatic	3.1	1.0E-01	Inc	6.8E-02	4.0E-02	na	5.7E-01	2.5E+00	Inc	1.2E-01	2.6
Gasoline Range Organics	4.2	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.9	9.7E-02	Inc	6.7E-05	5.0E+00	na	5.3E+00	1.9E-02	Inc	1.3E-05	0.019
Gasoline Range Organics, Aromatic	2.1	6.9E-02	Inc	4.8E-05	2.0E-01	na	1.1E-01	3.5E-01	Inc	4.4E-04	0.35
										HI	**5.5**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-45

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-46

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	164	1.9E-01	1.9E-03	Inc	1.0E+00	1.0E+00	1.4E-03	1.9E-01	1.9E-03	Inc	0.19
Antimony	0.12	1.4E-04	1.4E-06	Inc	4.0E-04	4.0E-04	4.0E-04	3.4E-01	3.4E-03	Inc	0.35
Barium	1.2	1.3E-03	1.3E-05	Inc	7.0E-02	7.0E-02	1.4E-04	1.9E-02	1.9E-04	Inc	0.019
Cobalt	0.037	4.2E-05	1.7E-07	Inc	2.0E-02	2.0E-02	5.7E-06	2.1E-03	8.4E-06	Inc	0.0021
Lead, Dissolved	0.30	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	2.2	2.6E-03	2.6E-05	Inc	1.4E-01	1.4E-01	1.4E-05	1.8E-02	1.8E-04	Inc	0.018
Nickel	0.091	1.0E-04	2.1E-07	Inc	2.0E-02	2.0E-02	2.0E-02	5.2E-03	1.0E-05	Inc	0.0052004
Vanadium	0.15	1.7E-04	1.7E-06	Inc	7.0E-03	7.0E-03	7.0E-03	2.4E-02	2.4E-04	Inc	0.025
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.00075	8.5E-07	1.8E-07	2.6E-09	4.0E-03	4.0E-03	8.6E-03	2.1E-04	4.4E-05	3.0E-07	0.00026
										HI	**0.60**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	7.7	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6.2	7.0E-03	Inc	1.7E-06	1.0E-01	na	2.9E-01	7.0E-02	Inc	5.8E-06	0.07
Diesel Range Organics, Aromatic	3.1	3.5E-03	Inc	8.4E-07	4.0E-02	na	5.7E-01	8.8E-02	Inc	1.5E-06	0.088
Gasoline Range Organics	4.2	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.9	3.4E-03	Inc	8.4E-10	2.0E+00	na	na	1.7E-03	Inc	na	0.0017
Gasoline Range Organics, Aromatic	2.1	2.4E-03	Inc	6.0E-10	3.0E-02	na	na	8.0E-02	Inc	na	0.080
										HI	**0.24**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-46

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 9 - Housing and Operations Landfill - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)
by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic
hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-47

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 10 - Buried Drum Field - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Thallium	0.34	1.2E-06	0.0E+00	6.1E-11	6.6E-05	6.6E-05	6.6E-05	1.9E-02	0.0E+00	9.3E-07	0.019
										HI	**0.019**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	26,500	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	21,200	7.7E-02	Inc	3.8E-06	1.0E-01	na	2.9E-01	7.7E-01	Inc	1.3E-05	0.77
Diesel Range Organics, Aromatic	10,600	3.9E-02	Inc	1.9E-06	4.0E-02	na	5.7E-01	9.6E-01	Inc	3.4E-06	0.96
										HI	**1.7**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-48

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 10 - Buried Drum Field - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Thallium	0.34	3.7E-06	0.0E+00	1.8E-10	7.0E-05	7.0E-05	7.0E-05	5.3E-02	0.0E+00	2.6E-06	0.053
										HI	**0.053**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	26,500	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	21,200	2.3E-01	Inc	1.1E-05	1.0E-01	na	2.9E-01	2.3E+00	Inc	4.0E-05	2.3
Diesel Range Organics, Aromatic	10,600	1.2E-01	Inc	5.7E-06	4.0E-02	na	5.7E-01	2.9E+00	Inc	1.0E-05	2.9
										HI	**5.2**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-49

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 10 - Buried Drum Field - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Thallium	0.34	9.7E-09	0.0E+00	3.0E-12	7.0E-05	7.0E-05	7.0E-05	1.4E-04	0.0E+00	4.3E-08	0.00014
										HI	**0.00014**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	26,500	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	21,200	6.1E-04	Inc	1.9E-07	1.0E-01	na	2.9E-01	6.1E-03	Inc	6.4E-07	0.0061
Diesel Range Organics, Aromatic	10,600	3.0E-04	Inc	9.3E-08	4.0E-02	na	5.7E-01	7.6E-03	Inc	1.6E-07	0.0076
										HI	**0.014**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-50

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 11- Fuel Storage Tank Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	3.4E-07	0.0E+00	2.5E-11	3.9E-03	3.9E-03	3.9E-03	1.3E-09	0.0E+00	9.8E-14	1.3E-09
										ILCR	**1E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-51

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 11 - Fuel Storage Tank Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	1.0E-06	0.0E+00	7.5E-11	3.9E-03	3.9E-03	3.9E-03	4.0E-09	0.0E+00	2.9E-13	4.0E-09
										ILCR	**4E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-52

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 11 - Fuel Storage Tank Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	8.3E-09	0.0E+00	2.6E-12	3.9E-03	3.9E-03	3.9E-03	3.3E-11	0.0E+00	1.0E-14	3.3E-11
										ILCR	**3E-11**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-53

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 11 - Fuel Storage Tank Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	3.1E-06	0.0E+00	1.5E-10	1.0E-01	1.0E-01	2.9E-01	3.1E-05	0.0E+00	5.3E-10	0.000031
										HI	**0.000031**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	69,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	55,280	2.0E-01	Inc	1.0E-05	1.0E-01	na	2.9E-01	2.0E+00	Inc	3.4E-05	2.0
Diesel Range Organics, Aromatic	27,640	1.0E-01	Inc	5.0E-06	4.0E-02	na	5.7E-01	2.5E+00	Inc	8.8E-06	2.5
Gasoline Range Organics	192	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	134	4.9E-04	Inc	2.4E-08	2.0E+00	na	na	2.4E-04	Inc	Inc	0.00024
Gasoline Range Organics, Aromatic	96	3.5E-04	Inc	1.7E-08	3.0E-02	na	na	1.2E-02	Inc	Inc	0.012
										HI	**4.5**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-54

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 11 - Fuel Storage Tank - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	9.3E-06	0.0E+00	4.6E-10	1.0E-01	1.0E-01	2.9E-01	9.3E-05	0.0E+00	1.6E-09	0.000093
										HI	**0.000093**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	69,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	55,280	6.0E-01	Inc	3.0E-05	1.0E-01	na	2.9E-01	6.0E+00	Inc	1.0E-04	6.0
Diesel Range Organics, Aromatic	27,640	3.0E-01	Inc	1.5E-05	4.0E-02	na	5.7E-01	7.5E+00	Inc	2.6E-05	7.5
Gasoline Range Organics	192	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	134	1.5E-03	Inc	7.3E-08	2.0E+00	na	na	7.3E-04	Inc	Inc	0.00073
Gasoline Range Organics, Aromatic	96	1.0E-03	Inc	5.2E-08	3.0E-02	na	na	3.5E-02	Inc	Inc	0.035
										HI	**14**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-55

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 11 - Fuel Storage Tank - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	0.85	2.4E-08	0.0E+00	7.5E-12	1.0E-01	1.0E-01	2.9E-01	2.4E-07	0.0E+00	2.6E-11	0.00000024
										HI	**0.00000024**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	69,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	55,280	1.6E-03	Inc	4.9E-07	1.0E-01	na	2.9E-01	1.6E-02	Inc	1.7E-06	0.016
Diesel Range Organics, Aromatic	27,640	7.9E-04	Inc	2.4E-07	4.0E-02	na	5.7E-01	2.0E-02	Inc	4.3E-07	0.020
Gasoline Range Organics	192	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	134	3.8E-06	Inc	1.2E-09	2.0E+00	na	na	1.9E-06	Inc	Inc	0.0000019
Gasoline Range Organics, Aromatic	96	2.7E-06	Inc	8.4E-10	3.0E-02	na	na	9.1E-05	Inc	Inc	0.000091
										HI	**0.036**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-56

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 11 - Fuel Storage Tank Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	3.8E-05	1.1E-05	1.1E-04	5.5E-02	5.5E-02	2.7E-02	2.1E-06	6.0E-07	3.1E-06	5.8E-06
Methylene chloride	0.011	4.2E-05	2.6E-06	5.0E-05	7.5E-03	7.5E-03	1.6E-03	3.2E-07	1.9E-08	8.1E-08	4.2E-07
										ILCR	**6E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-57

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 11 - Fuel Storage Tank Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	1.5E-04	4.2E-05	4.5E-04	5.5E-02	5.5E-02	2.7E-02	8.2E-06	2.3E-06	1.2E-05	2.3E-05
Methylene chloride	0.011	1.6E-04	1.0E-05	2.0E-04	7.5E-03	7.5E-03	1.6E-03	1.2E-06	7.5E-08	3.1E-07	1.6E-06
										ILCR	**2E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-58

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 11 - Fuel Storage Tank Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	3.9E-06	8.1E-07	1.2E-05	5.5E-02	5.5E-02	2.7E-02	2.2E-07	4.5E-08	3.2E-07	5.8E-07
Methylene chloride	0.011	4.3E-06	1.9E-07	5.2E-06	7.5E-03	7.5E-03	1.6E-03	3.2E-08	1.4E-09	8.3E-09	4.2E-08
										ILCR	**6E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-59

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 11 - Fuel Storage Tank Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	8.5E-05	8.3E-05	7.0E-04	4.0E-03	4.0E-03	8.6E-03	2.1E-02	2.1E-02	8.2E-02	0.12
Methylene chloride	0.011	9.3E-05	2.0E-05	3.1E-04	6.0E-02	6.0E-02	8.6E-01	1.5E-03	3.3E-04	3.6E-04	0.0022
n-Propylbenzene	0.016	1.4E-04	1.9E-03	2.7E-03	4.0E-02	4.0E-02	4.0E-02	3.4E-03	4.9E-02	6.8E-02	0.12
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	0.39	3.3E-03	1.1E-02	Inc	2.0E-02	2.0E-02	8.6E-04	1.6E-01	5.4E-01	Inc	0.71
										HI	**0.95**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	45	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	36	3.0E-01	Inc	2.0E-01	1.0E-01	na	2.9E-01	3.0E+00	Inc	7.0E-01	3.7
Diesel Range Organics, Aromatic	18	1.5E-01	Inc	1.0E-01	4.0E-02	na	5.7E-01	3.8E+00	Inc	1.8E-01	4.0
Gasoline Range Organics	1.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.77	6.5E-03	Inc	8.6E-02	5.0E+00	na	5.3E+00	1.3E-03	Inc	1.6E-02	0.018
Gasoline Range Organics, Aromatic	0.55	4.6E-03	Inc	6.1E-02	2.0E-01	na	1.1E-01	2.3E-02	Inc	5.6E-01	0.58
										HI	**8.3**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-59

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 11 - Fuel Storage Tank Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-60

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 11 - Fuel Tank Storage Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	3.3E-04	3.2E-04	2.7E-03	4.0E-03	4.0E-03	8.6E-03	8.2E-02	8.0E-02	3.2E-01	0.48
Methylene chloride	0.011	3.6E-04	7.6E-05	1.2E-03	6.0E-02	6.0E-02	8.6E-01	6.0E-03	1.3E-03	1.4E-03	0.0087
n-Propylbenzene	0.016	5.3E-04	7.6E-03	1.1E-02	4.0E-02	4.0E-02	4.0E-02	1.3E-02	1.9E-01	2.6E-01	0.47
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	0.39	1.3E-02	4.2E-02	Inc	2.0E-02	2.0E-02	8.6E-04	6.4E-01	2.1E+00	Inc	2.7
										HI	**3.7**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	45	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	36	1.2E+00	Inc	7.9E-01	1.0E-01	na	2.9E-01	1.2E+01	Inc	2.7E+00	15
Diesel Range Organics, Aromatic	18	5.9E-01	Inc	3.9E-01	4.0E-02	na	5.7E-01	1.5E+01	Inc	6.9E-01	15
Gasoline Range Organics	1.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.77	2.5E-02	Inc	3.3E-01	5.0E+00	na	5.3E+00	5.1E-03	Inc	6.3E-02	0.068
Gasoline Range Organics, Aromatic	0.55	1.8E-02	Inc	2.4E-01	2.0E-01	na	1.1E-01	9.0E-02	Inc	2.2E+00	2.3
										HI	**32**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-60

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 11 - Fuel Tank Storage Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-61

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 11 - Fuel Tank Storage Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.010	1.1E-05	2.4E-06	3.4E-05	4.0E-03	4.0E-03	8.6E-03	2.9E-03	5.9E-04	4.0E-03	0.0074
Methylene chloride	0.011	1.3E-05	5.6E-07	1.5E-05	6.0E-02	6.0E-02	8.6E-01	2.1E-04	9.3E-06	1.8E-05	0.00024
n-Propylbenzene	0.016	1.8E-05	5.6E-05	1.3E-04	4.0E-02	4.0E-02	4.0E-02	4.6E-04	1.4E-03	3.3E-03	0.0052
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	0.39	4.5E-04	3.1E-04	Inc	2.0E-02	2.0E-02	8.6E-04	2.2E-02	1.5E-02	Inc	0.038
										HI	**0.051**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	45	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	36	4.1E-02	Inc	9.9E-03	1.0E-01	na	2.9E-01	4.1E-01	Inc	3.4E-02	0.44
Diesel Range Organics, Aromatic	18	2.1E-02	Inc	4.9E-03	4.0E-02	na	5.7E-01	5.1E-01	Inc	8.7E-03	0.52
Gasoline Range Organics	1.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.77	8.8E-04	Inc	4.2E-03	5.0E+00	na	5.3E+00	1.8E-04	Inc	7.9E-04	0.00096
Gasoline Range Organics, Aromatic	0.55	6.3E-04	Inc	3.0E-03	2.0E-01	na	1.1E-01	3.1E-03	Inc	2.7E-02	0.030
										HI	**1.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-61

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 11 - Fuel Tank Storage Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-62

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13- Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	4.9E-09	0.0E+00	3.6E-13	5.5E-02	5.5E-02	2.7E-02	2.7E-10	0.0E+00	9.7E-15	2.7E-10
Ethylbenzene	1.4	5.8E-07	0.0E+00	4.2E-11	3.9E-03	3.9E-03	3.9E-03	2.2E-09	0.0E+00	1.6E-13	2.2E-09
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	4.6E-05	2.6E-05	3.4E-09	2.0E+00	2.0E+00	2.0E+00	9.3E-05	5.1E-05	6.8E-09	1.4E-04
										ILCR	**1E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-63

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	1.5E-08	0.0E+00	1.1E-12	5.5E-02	5.5E-02	2.7E-02	8.1E-10	0.0E+00	2.9E-14	8.1E-10
Ethylbenzene	1.4	1.7E-06	0.0E+00	1.3E-10	3.9E-03	3.9E-03	3.9E-03	6.7E-09	0.0E+00	4.9E-13	6.7E-09
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	1.4E-04	7.7E-05	1.0E-08	2.0E+00	2.0E+00	2.0E+00	2.8E-04	1.5E-04	2.0E-08	4.3E-04
										ILCR	**4E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-64

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	1.2E-10	0.0E+00	3.7E-14	5.5E-02	5.5E-02	2.7E-02	6.6E-12	0.0E+00	9.9E-16	6.6E-12
Ethylbenzene	1.4	1.4E-08	0.0E+00	4.3E-12	3.9E-03	3.9E-03	3.9E-03	5.5E-11	0.0E+00	1.7E-14	5.5E-11
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	1.1E-06	2.1E-06	3.5E-10	2.0E+00	2.0E+00	2.0E+00	2.3E-06	4.2E-06	6.9E-10	6.4E-06
										ILCR	**6E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-65

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	4.4E-08	0.0E+00	2.2E-12	4.0E-03	4.0E-03	8.6E-03	1.1E-05	0.0E+00	2.6E-10	0.000011
Ethylbenzene	1.4	5.2E-06	0.0E+00	2.6E-10	1.0E-01	1.0E-01	2.9E-01	5.2E-05	0.0E+00	8.9E-10	0.000052
m,p-Xylene	4.0	1.5E-05	0.0E+00	7.2E-10	2.0E-01	2.0E-01	2.9E-02	7.3E-05	0.0E+00	2.5E-08	0.000073
o-Xylene	0.80	2.9E-06	0.0E+00	1.4E-10	2.0E-01	2.0E-01	2.9E-02	1.5E-05	0.0E+00	5.0E-09	0.000015
Toluene	0.80	2.9E-06	0.0E+00	1.4E-10	2.0E-01	2.0E-01	1.1E-01	1.5E-05	0.0E+00	1.3E-09	0.000015
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	4.2E-04	1.9E-04	2.1E-08	2.0E-05	2.0E-05	2.0E-05	2.1E+01	9.3E+00	1.0E-03	30
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	15	5.4E-05	2.2E-05	2.7E-09	2.0E-02	2.0E-02	8.6E-04	2.7E-03	1.1E-03	3.1E-06	0.0038
										HI	**30**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	12,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	9,600	3.5E-02	Inc	1.7E-06	1.0E-01	na	2.9E-01	3.5E-01	Inc	6.0E-06	0.35
Diesel Range Organics, Aromatic	4,800	1.7E-02	Inc	8.7E-07	4.0E-02	na	5.7E-01	4.4E-01	Inc	1.5E-06	0.44
Gasoline Range Organics	294	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	206	7.5E-04	Inc	3.7E-08	5.0E+00	na	5.3E+00	1.5E-04	Inc	7.0E-09	0.000149826
Gasoline Range Organics, Aromatic	147	5.4E-04	Inc	2.7E-08	2.0E-01	na	1.1E-01	2.7E-03	Inc	2.4E-07	0.0027
Residual Range Organics	1,072	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	965	3.5E-03	Inc	1.7E-07	2.0E+00	na	na	1.8E-03	Inc	Inc	0.0018
Residual Range Organics, Aromatic	322	1.2E-03	Inc	5.8E-08	3.0E-02	na	na	3.9E-02	Inc	Inc	0.039
										HI	**0.83**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-65

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-66

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	1.3E-07	0.0E+00	6.6E-12	4.0E-03	4.0E-03	8.6E-03	3.3E-05	0.0E+00	7.7E-10	0.000033
Ethylbenzene	1.4	1.6E-05	0.0E+00	7.7E-10	1.0E-01	1.0E-01	2.9E-01	1.6E-04	0.0E+00	2.7E-09	0.00016
m,p-Xylene	4.0	4.4E-05	0.0E+00	2.2E-09	2.0E-01	2.0E-01	2.9E-02	2.2E-04	0.0E+00	7.5E-08	0.00022
o-Xylene	0.80	8.7E-06	0.0E+00	4.3E-10	2.0E-01	2.0E-01	2.9E-02	4.4E-05	0.0E+00	1.5E-08	0.000044
Toluene	0.80	8.7E-06	0.0E+00	4.3E-10	2.0E-01	2.0E-01	1.1E-01	4.4E-05	0.0E+00	3.9E-09	0.000044
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	15	1.6E-04	6.7E-05	8.1E-09	2.0E-02	2.0E-02	8.6E-04	8.2E-03	3.4E-03	9.4E-06	0.012
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	1.3E-03	5.6E-04	6.2E-08	2.0E-05	2.0E-05	2.0E-05	6.3E+01	2.8E+01	3.1E-03	91
										HI	**91**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	12,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	9,600	1.0E-01	Inc	5.2E-06	1.0E-01	na	2.9E-01	1.0E+00	Inc	1.8E-05	1.0
Diesel Range Organics, Aromatic	4,800	5.2E-02	Inc	2.6E-06	4.0E-02	na	5.7E-01	1.3E+00	Inc	4.6E-06	1.3
Gasoline Range Organics	294	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	205.8	2.2E-03	Inc	1.1E-07	5.0E+00	na	5.3E+00	4.5E-04	Inc	2.1E-08	0.00045
Gasoline Range Organics, Aromatic	147	1.6E-03	Inc	8.0E-08	2.0E-01	na	1.1E-01	8.0E-03	Inc	7.2E-07	0.008
Residual Range Organics	1,072	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	965	1.1E-02	Inc	5.2E-07	2.0E+00	na	na	5.3E-03	Inc	Inc	0.005
Residual Range Organics, Aromatic	322	3.5E-03	Inc	1.7E-07	3.0E-02	na	na	1.2E-01	Inc	Inc	0.12
										HI	**2.5**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard

HI Hazard index.
HQ Hazard quotient.
Inc Incomplete pathway.
mg/kg Milligrams per kilogram.

TABLE F-66

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ

estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

mg/kd-d Milligrams per kilogram per day.
na not available

TABLE F-67

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.012	3.5E-10	0.0E+00	1.1E-13	3.0E-03	3.0E-03	1.7E-03	1.2E-07	0.0E+00	6.3E-11	0.00000012
Ethylbenzene	1.4	4.1E-08	0.0E+00	1.3E-11	1.0E-01	1.0E-01	2.9E-01	4.1E-07	0.0E+00	4.3E-11	0.00000041
m,p-Xylene	4.0	1.1E-07	0.0E+00	3.5E-11	2.0E-01	2.0E-01	2.9E-02	5.7E-07	0.0E+00	1.2E-09	0.00000057
o-Xylene	0.80	2.3E-08	0.0E+00	7.0E-12	2.0E-01	2.0E-01	2.9E-02	1.1E-07	0.0E+00	2.4E-10	0.00000011
Toluene	0.80	2.3E-08	0.0E+00	7.0E-12	2.0E-01	2.0E-01	1.1E-01	1.1E-07	0.0E+00	6.4E-11	0.00000011
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	115	3.3E-06	6.1E-06	1.0E-09	2.0E-05	2.0E-05	2.0E-05	1.6E-01	3.0E-01	5.0E-05	0.47
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	15	4.3E-07	7.3E-07	1.3E-10	2.0E-02	2.0E-02	8.6E-04	2.1E-05	3.7E-05	1.5E-07	0.000058
										HI	**0.47**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	12,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	9,600	2.7E-04	Inc	8.4E-08	1.0E-01	na	2.9E-01	2.7E-03	Inc	2.9E-07	0.0027
Diesel Range Organics, Aromatic	4,800	1.4E-04	Inc	4.2E-08	4.0E-02	na	5.7E-01	3.4E-03	Inc	7.4E-08	0.0034
Gasoline Range Organics	294	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	206	5.9E-06	Inc	1.8E-09	5.0E+00	na	5.3E+00	1.2E-06	Inc	3.4E-10	0.0000012
Gasoline Range Organics, Aromatic	147	4.2E-06	Inc	1.3E-09	2.0E-01	na	1.1E-01	2.1E-05	Inc	1.2E-08	0.000021
Residual Range Organics	1,072	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	965	2.8E-05	Inc	8.5E-09	2.0E+00	na	na	1.4E-05	Inc	Inc	0.000014
Residual Range Organics, Aromatic	322	9.2E-06	Inc	2.8E-09	3.0E-02	na	na	3.1E-04	Inc	Inc	0.00031
										HI	**0.0065**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-67

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-68

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	2.8E-04	3.8E-06	Inc	1.5E+00	1.5E+00	1.5E+01	4.2E-04	5.7E-06	Inc	4.2E-04
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	4.6E-04	1.3E-04	1.4E-03	5.5E-02	5.5E-02	2.7E-02	2.5E-05	7.1E-06	3.7E-05	7.0E-05
Ethylbenzene	0.14	5.3E-04	5.4E-04	2.4E-03	3.9E-03	3.9E-03	3.9E-03	2.1E-06	2.1E-06	9.3E-06	1.3E-05
										ILCR	**5E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-69

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	1.1E-03	1.5E-05	Inc	1.5E+00	1.5E+00	1.5E+01	1.6E-03	2.2E-05	Inc	1.7E-03
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	1.8E-03	5.1E-04	5.4E-03	5.5E-02	5.5E-02	2.7E-02	9.8E-05	2.8E-05	1.4E-04	2.7E-04
Ethylbenzene	0.14	2.1E-03	2.1E-03	9.3E-03	3.9E-03	3.9E-03	3.9E-03	8.0E-06	8.1E-06	3.6E-05	5.2E-05
										ILCR	**2E-03**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-70

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	2.9E-05	2.9E-07	Inc	1.5E+00	1.5E+00	1.5E+01	4.3E-05	4.3E-07	Inc	4.3E-05
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	4.7E-05	9.7E-06	1.4E-04	5.5E-02	5.5E-02	2.7E-02	2.6E-06	5.3E-07	3.8E-06	6.9E-06
Ethylbenzene	0.14	5.4E-05	4.0E-05	6.5E-05	3.9E-03	3.9E-03	3.9E-03	2.1E-07	1.6E-07	2.5E-07	6.2E-07
										ILCR	**5E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-71

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	6.2E-04	2.9E-05	Inc	3.0E-04	3.0E-04	3.0E-04	2.1E+00	9.7E-02	Inc	2.2
Copper	0.21	1.8E-03	8.4E-05	Inc	3.7E-02	3.7E-02	3.7E-02	4.8E-02	2.3E-03	Inc	0.050
Lead	0.45	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.015	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.17	1.4E-03	6.8E-05	Inc	2.0E-02	2.0E-02	2.0E-02	7.2E-02	3.4E-03	Inc	0.075
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	1.0E-03	9.9E-04	8.5E-03	4.0E-03	4.0E-03	8.6E-03	2.5E-01	2.5E-01	9.8E-01	1.5
Ethylbenzene	0.14	1.2E-03	4.1E-03	1.5E-02	1.0E-01	1.0E-01	2.9E-01	1.2E-02	4.1E-02	5.1E-02	0.10
Toluene	0.17	1.4E-03	3.1E-03	1.4E-02	2.0E-01	2.0E-01	1.1E-01	7.2E-03	1.5E-02	1.3E-01	0.15
										HI	**4.0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	80	6.8E-01	Inc	4.5E-01	1.0E-01	na	2.9E-01	6.8E+00	Inc	1.6E+00	8.3
Diesel Range Organics, Aromatic	40	3.4E-01	Inc	2.3E-01	4.0E-02	na	5.7E-01	8.5E+00	Inc	4.0E-01	8.8
Gasoline Range Organics	4.0	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.8	2.4E-02	Inc	3.1E-01	5.0E+00	na	5.3E+00	4.7E-03	Inc	5.9E-02	0.064
Gasoline Range Organics, Aromatic	2.0	1.7E-02	Inc	2.2E-01	2.0E-01	na	1.1E-01	8.5E-02	Inc	2.0E+00	2.1
Residual Range Organics	2.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.1	1.7E-02	Inc	1.2E-05	2.0E+00	na	na	8.7E-03	Inc	Inc	0.0087
Residual Range Organics, Aromatic	0.69	5.8E-03	Inc	4.1E-06	3.0E-02	na	na	1.9E-01	Inc	Inc	0.19
										HI	**20**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.

TABLE F-71

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

na	not available
VOC	Volatile organic compound.

TABLE F-72

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	2.4E-03	1.1E-04	Inc	3.0E-04	3.0E-04	3.0E-04	8.0E+00	3.8E-01	Inc	8.4
Copper	0.21	6.9E-03	3.3E-04	Inc	3.7E-02	3.7E-02	3.7E-02	1.9E-01	8.8E-03	Inc	0.20
Lead	0.45	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.015	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.17	5.6E-03	5.3E-05	Inc	2.0E-02	2.0E-02	2.0E-02	2.8E-01	2.6E-03	Inc	0.28
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	3.9E-03	3.9E-03	3.3E-02	4.0E-03	4.0E-03	8.6E-03	9.9E-01	9.6E-01	3.8E+00	5.8
Ethylbenzene	0.14	4.6E-03	1.6E-02	5.7E-02	1.0E-01	1.0E-01	2.9E-01	4.6E-02	1.6E-01	2.0E-01	0.40
Toluene	0.17	5.6E-03	1.2E-02	5.4E-02	2.0E-01	2.0E-01	1.1E-01	2.8E-02	6.0E-02	4.9E-01	0.58
										HI	**16**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	80	2.6E+00	Inc	1.8E+00	1.0E-01	na	2.9E-01	2.6E+01	Inc	6.0E+00	32
Diesel Range Organics, Aromatic	40	1.3E+00	Inc	8.8E-01	4.0E-02	na	5.7E-01	3.3E+01	Inc	1.5E+00	34
Gasoline Range Organics	4.0	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.8	9.2E-02	Inc	1.2E+00	5.0E+00	na	5.3E+00	1.8E-02	Inc	2.3E-01	0.25
Gasoline Range Organics, Aromatic	2.0	6.6E-02	Inc	8.7E-01	2.0E-01	na	1.1E-01	3.3E-01	Inc	7.9E+00	8.2
Residual Range Organics	2.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.1	6.8E-02	Inc	3.5E-04	2.0E+00	na	na	3.4E-02	Inc	Inc	0.034
Residual Range Organics, Aromatic	0.69	2.3E-02	Inc	1.2E-04	3.0E-02	na	na	7.6E-01	Inc	Inc	0.76
										HI	**76**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-72

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

VOC Volatile organic compound.

TABLE F-73

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.073	8.3E-05	8.3E-07	Inc	3.0E-04	3.0E-04	3.0E-04	2.8E-01	2.8E-03	Inc	0.28
Copper	0.21	2.4E-04	2.4E-06	Inc	3.7E-02	3.7E-02	3.7E-02	6.5E-03	6.5E-05	Inc	0.0065
Lead	0.45	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.015	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.17	1.9E-04	3.9E-07	Inc	2.0E-02	2.0E-02	2.0E-02	9.7E-03	1.9E-05	Inc	0.0097
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.12	1.4E-04	2.8E-05	4.1E-04	4.0E-03	4.0E-03	8.6E-03	3.4E-02	7.1E-03	4.8E-02	0.089
Ethylbenzene	0.14	1.6E-04	1.2E-04	7.1E-04	1.0E-01	1.0E-01	2.9E-01	1.6E-03	1.2E-03	2.5E-03	0.0052
Toluene	0.17	1.9E-04	8.8E-05	6.8E-04	2.0E-01	2.0E-01	1.1E-01	9.7E-04	4.4E-04	6.2E-03	0.0076
										HI	**0.40**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	80	9.1E-02	Inc	2.2E-02	1.0E-01	na	2.9E-01	9.1E-01	Inc	7.6E-02	0.99
Diesel Range Organics, Aromatic	40	4.6E-02	Inc	1.1E-02	4.0E-02	na	5.7E-01	1.1E+00	Inc	1.9E-02	1.2
Gasoline Range Organics	4.0	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	2.8	3.2E-03	Inc	1.5E-02	5.0E+00	na	5.3E+00	6.4E-04	Inc	2.9E-03	0.0035
Gasoline Range Organics, Aromatic	2.0	2.3E-03	Inc	1.1E-02	2.0E-01	na	1.1E-01	1.1E-02	Inc	9.9E-02	0.11
Residual Range Organics	2.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.1	2.4E-03	Inc	5.9E-07	2.0E+00	na	na	1.2E-03	Inc	Inc	0.0012
Residual Range Organics, Aromatic	0.69	7.9E-04	Inc	2.0E-07	3.0E-02	na	na	2.6E-02	Inc	Inc	0.026
										HI	**2.3**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-73

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 13 - Heat and Electrical Power Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

VOC Volatile organic compound.

TABLE F-74

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 15- Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.0	4.0E-07	0.0E+00	2.9E-11	3.9E-03	3.9E-03	3.9E-03	1.6E-09	0.0E+00	1.1E-13	1.6E-09
										ILCR	**2E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-75

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk: Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.0	1.2E-06	0.0E+00	8.8E-11	3.9E-03	3.9E-03	3.9E-03	4.7E-09	0.0E+00	3.4E-13	4.7E-09
										ILCR	**5E-09**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-76

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.0	9.8E-09	0.0E+00	3.0E-12	3.9E-03	3.9E-03	3.9E-03	3.8E-11	0.0E+00	1.2E-14	3.8E-11
										ILCR	**4E-11**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-77

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Ethylbenzene	1.0	3.6E-06	0.0E+00	1.8E-10	1.0E-01	1.0E-01	2.9E-01	3.6E-05	0.0E+00	6.2E-10	0.000036
m,p-Xylene	1.8	6.6E-06	0.0E+00	3.3E-10	2.0E-01	2.0E-01	2.9E-02	3.3E-05	0.0E+00	1.1E-08	0.000033
o-Xylene	0.015	5.5E-08	0.0E+00	2.7E-12	2.0E-01	2.0E-01	2.9E-02	2.7E-07	0.0E+00	9.3E-11	0.00000027
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	28	1.0E-04	4.2E-05	5.1E-09	2.0E-02	2.0E-02	8.6E-04	5.1E-03	2.1E-03	5.9E-06	0.0072
										HI	**0.0073**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	16,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	12,800	4.7E-02	Inc	2.3E-06	1.0E-01	na	2.9E-01	4.7E-01	Inc	8.0E-06	0.47
Diesel Range Organics, Aromatic	6,400	2.3E-02	Inc	1.2E-06	4.0E-02	na	5.7E-01	5.8E-01	Inc	2.0E-06	0.58
Gasoline Range Organics	110	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	77	2.8E-04	Inc	1.4E-08	5.0E+00	na	5.3E+00	5.6E-05	Inc	2.6E-09	0.000056
Gasoline Range Organics, Aromatic	55	2.0E-04	Inc	9.9E-09	2.0E-01	na	1.1E-01	1.0E-03	Inc	9.0E-08	0.001
										HI	**1.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-78

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.0	1.1E-05	0.0E+00	5.4E-10	1.0E-01	1.0E-01	2.9E-01	1.1E-04	0.0E+00	1.9E-09	0.00011
m,p-Xylene	1.8	2.0E-05	0.0E+00	9.8E-10	2.0E-01	2.0E-01	2.9E-02	9.8E-05	0.0E+00	3.4E-08	0.00010
o-Xylene	0.015	1.6E-07	0.0E+00	8.1E-12	2.0E-01	2.0E-01	2.9E-02	8.2E-07	0.0E+00	2.8E-10	0.00000082
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	28	3.1E-04	1.3E-04	1.5E-08	2.0E-02	2.0E-02	8.6E-04	1.5E-02	6.3E-03	1.8E-05	0.022
										HI	**0.022**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	16,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	12,800	1.4E-01	Inc	6.9E-06	1.0E-01	na	2.9E-01	1.4E+00	Inc	2.4E-05	1.4
Diesel Range Organics, Aromatic	6,400	7.0E-02	Inc	3.5E-06	4.0E-02	na	5.7E-01	1.7E+00	Inc	6.1E-06	1.7
Gasoline Range Organics	110	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	77	8.4E-04	Inc	4.2E-08	5.0E+00	na	5.3E+00	1.7E-04	Inc	7.9E-09	0.00017
Gasoline Range Organics, Aromatic	55	6.0E-04	Inc	3.0E-08	2.0E-01	na	1.1E-01	3.0E-03	Inc	2.7E-07	0.0030
										HI	**3.1**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-78

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-79

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.0	2.9E-08	0.0E+00	8.8E-12	1.0E-01	1.0E-01	2.9E-01	2.9E-07	0.0E+00	3.0E-11	0.00000029
m,p-Xylene	1.8	5.1E-08	0.0E+00	1.6E-11	2.0E-01	2.0E-01	2.9E-02	2.6E-07	0.0E+00	5.5E-10	0.00000026
o-Xylene	0.015	4.3E-10	0.0E+00	1.3E-13	2.0E-01	2.0E-01	2.9E-02	2.1E-09	0.0E+00	4.5E-12	0.0000000021
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	28	8.0E-07	1.4E-06	2.5E-10	2.0E-02	2.0E-02	8.6E-04	4.0E-05	6.9E-05	2.9E-07	0.00011
										HI	**0.00011**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	16,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	12,800	3.7E-04	Inc	1.1E-07	1.0E-01	na	2.9E-01	3.7E-03	Inc	3.9E-07	0.0037
Diesel Range Organics, Aromatic	6,400	1.8E-04	Inc	5.6E-08	4.0E-02	na	5.7E-01	4.6E-03	Inc	9.9E-08	0.0046
Gasoline Range Organics	110	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	77	2.2E-06	Inc	6.8E-10	5.0E+00	na	5.3E+00	4.4E-07	Inc	1.3E-10	0.00000044
Gasoline Range Organics, Aromatic	55	1.6E-06	Inc	4.8E-10	2.0E-01	na	1.1E-01	7.8E-06	Inc	4.4E-09	0.0000079
										HI	**0.0082**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-79

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-80

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.11	4.2E-04	5.8E-06	Inc	1.5E+00	1.5E+00	1.5E+01	6.3E-04	8.6E-06	Inc	6.4E-04
										ILCR	**6E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-81

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.11	1.6E-03	2.2E-05	Inc	1.5E+00	1.5E+00	1.5E+01	2.5E-03	3.4E-05	Inc	2.5E-03
										ILCR	**2E-03**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-82

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.11	4.3E-05	4.3E-07	Inc	1.5E+00	1.5E+00	1.5E+01	6.5E-05	6.5E-07	Inc	6.5E-05
										ILCR	**7E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-83

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.11	9.3E-04	4.4E-05	Inc	3.0E-04	3.0E-04	3.0E-04	3.1E+00	1.5E-01	Inc	3.2
Arsenic, Dissolved	0.006	5.1E-05	2.4E-06	Inc	3.0E-04	3.0E-04	3.0E-04	1.7E-01	8.0E-03	Inc	0.18
Lead	0.68	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.20	1.7E-03	1.6E-05	Inc	2.0E-02	2.0E-02	2.0E-02	8.5E-02	8.0E-04	Inc	0.085
										HI	**3.5**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	960	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	768	6.5E+00	Inc	4.3E+00	1.0E-01	na	2.9E-01	6.5E+01	Inc	1.5E+01	80
Diesel Range Organics, Aromatic	384	3.2E+00	Inc	2.2E+00	4.0E-02	na	5.7E-01	8.1E+01	Inc	3.8E+00	85
Residual Range Organics	3.8	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3.4	2.9E-02	Inc	2.0E-05	2.0E+00	na	na	1.4E-02	Inc	Inc	0.014
Residual Range Organics, Aromatic	1.1	9.6E-03	Inc	6.7E-06	3.0E-02	na	na	3.2E-01	Inc	Inc	0.32
										HI	**165**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate. Please refer to Section 4.2.3.3.3.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-83

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-84

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Arsenic	0.11	3.6E-03	1.7E-04	Inc	3.0E-04	3.0E-04	3.0E-04	1.2E+01	5.7E-01	Inc	13
Arsenic, Dissolved	0.0060	2.0E-04	9.3E-06	Inc	3.0E-04	3.0E-04	3.0E-04	6.6E-01	3.1E-02	Inc	0.69
Lead	0.68	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.20	6.6E-03	6.2E-05	Inc	2.0E-02	2.0E-02	2.0E-02	3.3E-01	3.1E-03	Inc	0.33
										HI	**14**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	960	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	768	2.5E+01	Inc	1.7E+01	1.0E-01	na	2.9E-01	2.5E+02	Inc	5.8E+01	311
Diesel Range Organics, Aromatic	384	1.3E+01	Inc	8.4E+00	4.0E-02	na	5.7E-01	3.2E+02	Inc	1.5E+01	330
Residual Range Organics	3.8	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3.4	1.1E-01	Inc	7.8E-05	2.0E+00	na	na	5.6E-02	Inc	Inc	0.056
Residual Range Organics, Aromatic	1.1	3.7E-02	Inc	2.6E-05	3.0E-02	na	na	1.2E+00	Inc	Inc	1.2
										HI	**642**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-84

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-85

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.11	1.3E-04	1.3E-06	Inc	3.0E-04	3.0E-04	3.0E-04	4.2E-01	4.2E-03	Inc	0.42
Arsenic, Dissolved	0.006	6.8E-06	6.8E-08	Inc	3.0E-04	3.0E-04	3.0E-04	2.3E-02	2.3E-04	Inc	0.023
Lead	0.68	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.20	2.3E-04	4.6E-07	Inc	2.0E-02	2.0E-02	2.0E-02	1.1E-02	2.3E-05	Inc	0.011
										HI	**0.46**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	960	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	768	8.8E-01	Inc	2.1E-01	1.0E-01	na	2.9E-01	8.8E+00	Inc	7.3E-01	9.5
Diesel Range Organics, Aromatic	384	4.4E-01	Inc	1.1E-01	4.0E-02	na	5.7E-01	1.1E+01	Inc	1.8E-01	11
Residual Range Organics	3.8	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3.4	3.9E-03	Inc	9.8E-07	2.0E+00	na	na	2.0E-03	Inc	Inc	0.0020
Residual Range Organics, Aromatic	1.1	1.3E-03	Inc	3.3E-07	3.0E-02	na	na	4.3E-02	Inc	Inc	0.043
										HI	**21**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-85

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 15 - Buried Fuel Line Spill Area - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

of a medium

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-86

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	6.4	2.6E-06	3.0E-07	1.9E-10	1.5E+00	1.5E+00	1.5E+01	3.9E-06	4.6E-07	2.8E-09	4.3E-06
Beryllium	1.1	4.2E-07	0.0E+00	3.1E-11	na	na	8.4E+00	na	na	2.6E-10	2.6E-10
Cadmium	2.4	9.9E-07	3.9E-09	7.2E-11	na	na	6.3E+00	na	na	4.5E-10	4.5E-10
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	2.9E-09	0.0E+00	2.1E-13	7.5E-03	7.5E-03	1.6E-03	2.2E-11	0.0E+00	3.5E-16	2.2E-11
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	3.1E-07	1.7E-07	2.3E-11	2.0E+00	2.0E+00	2.0E+00	6.3E-07	3.5E-07	4.6E-11	9.7E-07
										ILCR	**5E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-87

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	6.4	7.7E-06	9.1E-07	5.6E-10	1.5E+00	1.5E+00	1.5E+01	1.2E-05	1.4E-06	8.5E-09	1.3E-05
Beryllium	1.1	1.3E-06	0.0E+00	9.3E-11	na	na	8.4E+00	na	na	7.8E-10	7.8E-10
Cadmium	2.4	3.0E-06	1.2E-08	2.2E-10	na	na	6.3E+00	na	na	1.4E-09	1.4E-09
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	8.7E-09	0.0E+00	6.4E-13	7.5E-03	7.5E-03	1.6E-03	6.5E-11	0.0E+00	1.0E-15	6.5E-11
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	9.4E-07	5.2E-07	6.9E-11	2.0E+00	2.0E+00	2.0E+00	1.9E-06	1.0E-06	1.4E-10	2.9E-06
										ILCR	**2E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-88

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	6.4	6.2E-08	2.5E-08	1.9E-11	1.5E+00	1.5E+00	1.5E+01	9.4E-08	3.7E-08	2.9E-10	1.3E-07
Beryllium	1.1	1.0E-08	0.0E+00	3.2E-12	na	na	8.4E+00	na	na	2.7E-11	2.7E-11
Cadmium	2.4	2.4E-08	3.2E-10	7.4E-12	na	na	6.3E+00	na	na	4.6E-11	4.6E-11
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	7.0E-11	0.0E+00	2.2E-14	7.5E-03	7.5E-03	1.6E-03	5.3E-13	0.0E+00	3.6E-17	5.3E-13
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	7.6E-09	1.4E-08	2.3E-12	2.0E+00	2.0E+00	2.0E+00	1.5E-08	2.8E-08	4.7E-12	4.3E-08
										ILCR	**2E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-89

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Antimony	9.6	3.5E-05	0.0E+00	1.7E-09	4.0E-04	4.0E-04	4.0E-04	8.8E-02	0.0E+00	4.3E-06	0.088
Arsenic	6.4	2.3E-05	2.2E-06	1.2E-09	3.0E-04	3.0E-04	3.0E-04	7.7E-02	7.4E-03	3.8E-06	0.085
Beryllium	1.1	3.8E-06	0.0E+00	1.9E-10	2.0E-03	2.0E-03	5.7E-06	1.9E-03	0.0E+00	3.3E-05	0.0019
Cadmium	2.4	8.9E-06	2.8E-08	4.4E-10	5.0E-04	5.0E-04	5.0E-04	1.8E-02	5.6E-05	8.8E-07	0.018
Chromium	69	2.5E-04	0.0E+00	1.2E-08	1.5E+00	1.5E+00	1.5E+00	1.7E-04	0.0E+00	8.3E-09	0.00017
Lead	530	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Thallium	0.26	9.5E-07	0.0E+00	4.7E-11	7.0E-05	7.0E-05	7.0E-05	1.4E-02	0.0E+00	6.7E-07	0.014
Zinc	3,521	1.3E-02	0.0E+00	6.4E-07	3.0E-01	3.0E-01	3.0E-01	4.3E-02	0.0E+00	2.1E-06	0.043
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	2.6E-08	0.0E+00	1.3E-12	6.0E-02	6.0E-02	8.6E-01	4.4E-07	0.0E+00	1.5E-12	0.00000044
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	2.8E-06	1.3E-06	1.4E-10	2.0E-05	2.0E-05	2.0E-05	1.4E-01	6.3E-02	7.0E-06	0.20
										HI	**0.45**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-89

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-90

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Antimony	9.6	1.1E-04	1.0E-05	5.2E-09	4.0E-04	4.0E-04	4.0E-04	2.6E-01	2.5E-02	1.3E-05	0.29
Arsenic	6.4	7.0E-05	6.6E-06	3.5E-09	3.0E-04	3.0E-04	3.0E-04	2.3E-01	2.2E-02	1.2E-05	0.25
Beryllium	1.1	1.1E-05	1.1E-06	5.7E-10	2.0E-03	2.0E-03	5.7E-06	5.7E-03	5.5E-04	1.0E-04	0.0064
Cadmium	2.4	2.7E-05	8.5E-08	1.3E-09	5.0E-04	5.0E-04	5.0E-04	5.3E-02	1.7E-04	2.7E-06	0.054
Chromium	69	7.5E-04	0.0E+00	3.7E-08	1.5E+00	1.5E+00	1.5E+00	5.0E-04	0.0E+00	2.5E-08	0.00050
Lead	530	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Thallium	0.26	2.8E-06	0.0E+00	1.4E-10	7.0E-05	7.0E-05	7.0E-05	4.1E-02	0.0E+00	2.0E-06	0.041
Zinc	3,521	3.8E-02	0.0E+00	1.9E-06	3.0E-01	3.0E-01	3.0E-01	1.3E-01	0.0E+00	6.4E-06	0.13
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	7.9E-08	0.0E+00	3.9E-12	6.0E-02	6.0E-02	8.6E-01	1.3E-06	0.0E+00	4.5E-12	0.0000013
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	8.5E-06	3.8E-06	4.2E-10	2.0E-05	2.0E-05	2.0E-05	4.2E-01	1.9E-01	2.1E-05	0.61
										HI	**1.4**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-90

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-91

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Antimony	9.6	2.7E-07	0.0E+00	8.5E-11	4.0E-04	4.0E-04	4.0E-04	6.9E-04	0.0E+00	2.1E-07	0.00069
Arsenic	6.4	1.8E-07	7.2E-08	5.6E-11	3.0E-04	3.0E-04	3.0E-04	6.1E-04	2.4E-04	1.9E-07	0.00085
Beryllium	1.1	3.0E-08	0.0E+00	9.2E-12	2.0E-03	2.0E-03	5.7E-06	1.5E-05	0.0E+00	1.6E-06	0.000017
Cadmium	2.4	7.0E-08	9.2E-10	2.2E-11	5.0E-04	5.0E-04	5.0E-04	1.4E-04	1.8E-06	4.3E-08	0.00014
Chromium	69	2.0E-06	0.0E+00	6.0E-10	1.5E+00	1.5E+00	1.5E+00	1.3E-06	0.0E+00	4.0E-10	0.0000013
Lead	530	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Thallium	0.26	7.4E-09	0.0E+00	2.3E-12	7.0E-05	7.0E-05	7.0E-05	1.1E-04	0.0E+00	3.3E-08	0.00011
Zinc	3,521	1.0E-04	0.0E+00	3.1E-08	3.0E-01	3.0E-01	3.0E-01	3.3E-04	0.0E+00	1.0E-07	0.00034
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0072	2.1E-10	0.0E+00	6.3E-14	6.0E-02	6.0E-02	8.6E-01	3.4E-09	0.0E+00	7.4E-14	0.0000000034
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.78	2.2E-08	4.1E-08	6.8E-12	2.0E-05	2.0E-05	2.0E-05	1.1E-03	2.1E-03	3.4E-07	0.0032
										HI	**0.0053**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-91

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-92

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
bis(2-ethylexyl)phthalate	0.017	6.5E-05	2.2E-05	9.6E-09	1.4E-02	1.4E-02	1.4E-02	9.1E-07	3.1E-07	1.3E-10	1.2E-06
Trichloroethene	0.0033	1.3E-05	2.7E-06	7.3E-05	4.0E-01	4.0E-01	4.0E-01	5.0E-06	1.1E-06	2.9E-05	3.5E-05
										ILCR	**4E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-93

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
bis(2-ethylexyl)phthalate	0.017	2.5E-04	8.7E-05	3.7E-08	1.4E-02	1.4E-02	1.4E-02	3.6E-06	1.2E-06	5.2E-10	4.8E-06
Trichloroethene	0.0033	4.9E-05	1.1E-05	2.8E-04	4.0E-01	4.0E-01	4.0E-01	2.0E-05	4.2E-06	1.1E-04	1.4E-04
										ILCR	**1E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-94

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
bis(2-ethylexyl)phthalate	0.017	6.7E-06	1.7E-06	9.8E-10	1.4E-02	1.4E-02	1.4E-02	9.3E-08	2.3E-08	1.4E-11	1.2E-07
Trichloroethene	0.0033	1.3E-06	2.0E-07	7.4E-06	4.0E-01	4.0E-01	4.0E-01	5.2E-07	8.1E-08	3.0E-06	3.6E-06
										ILCR	**4E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-95

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Beryllium	0.040	3.4E-04	1.6E-05	Inc	2.0E-03	2.0E-03	5.7E-06	1.7E-01	8.0E-03	Inc	0.18
Cadmium	0.060	5.1E-04	2.4E-05	Inc	5.0E-04	5.0E-04	5.0E-04	1.0E+00	4.8E-02	Inc	1.1
Copper	0.50	4.2E-03	2.0E-04	Inc	3.7E-02	3.7E-02	3.7E-02	1.1E-01	5.4E-03	Inc	0.12
Lead	0.53	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.0040	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.42	3.6E-03	3.4E-05	Inc	2.0E-02	2.0E-02	2.0E-02	1.8E-01	1.7E-03	Inc	0.18
Zinc	1.5	1.3E-02	6.0E-04	Inc	3.0E-01	3.0E-01	3.0E-01	4.2E-02	2.0E-03	Inc	0.044
VOLATILE ORGANIC COMPOUNDS											
4-Isopropyltoluene	0.0066	5.6E-05	3.2E-04	9.7E-04	1.0E-01	1.0E-01	1.1E-01	5.6E-04	3.2E-03	8.8E-03	0.013
bis(2-ethylexyl)phthalate	0.017	1.4E-04	1.7E-04	5.9E-08	2.0E-02	2.0E-02	2.0E-02	7.2E-03	8.5E-03	2.9E-06	0.016
n-Propylbenzene	0.0043	3.6E-05	5.2E-04	7.3E-04	4.0E-02	4.0E-02	4.0E-02	9.1E-04	1.3E-02	1.8E-02	0.032
sec-Butylbenzene	0.0040	3.4E-05	1.3E-04	9.6E-04	4.0E-02	4.0E-02	4.0E-02	8.5E-04	3.2E-03	2.4E-02	0.028
Trichloroethene	0.0033	2.8E-05	2.1E-05	4.5E-04	3.0E-04	3.0E-04	1.0E-02	9.3E-02	6.9E-02	4.5E-02	0.21
										HI	**1.9**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-95

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-96

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Beryllium	0.04	1.3E-03	6.2E-05	Inc	2.0E-03	2.0E-03	5.7E-06	6.6E-01	3.1E-02	Inc	0.69
Cadmium	0.06	2.0E-03	9.3E-05	Inc	5.0E-04	5.0E-04	5.0E-04	3.9E+00	1.9E-01	Inc	4.1
Copper	0.50	1.6E-02	7.8E-04	Inc	3.7E-02	3.7E-02	3.7E-02	4.4E-01	2.1E-02	Inc	0.47
Lead	0.53	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.004	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.42	1.4E-02	1.3E-04	Inc	2.0E-02	2.0E-02	2.0E-02	6.9E-01	6.5E-03	Inc	0.70
Zinc	1.5	4.9E-02	2.3E-03	Inc	3.0E-01	3.0E-01	3.0E-01	1.6E-01	7.8E-03	Inc	0.17
VOLATILE ORGANIC COMPOUNDS											
4-Isopropyltoluene	0.0066	2.2E-04	1.2E-03	3.8E-03	1.0E-01	1.0E-01	1.1E-01	2.2E-03	1.2E-02	3.4E-02	0.049
bis(2-ethylexyl)phthalate	0.0170	5.6E-04	6.6E-04	2.3E-07	2.0E-02	2.0E-02	2.0E-02	2.8E-02	3.3E-02	1.1E-05	0.061
n-Propylbenzene	0.0043	1.4E-04	2.0E-03	2.8E-03	4.0E-02	4.0E-02	4.0E-02	3.5E-03	5.1E-02	7.1E-02	0.13
sec-Butylbenzene	0.0040	1.3E-04	5.0E-04	3.7E-03	4.0E-02	4.0E-02	4.0E-02	3.3E-03	1.2E-02	9.4E-02	0.11
Trichloroethene	0.0033	1.1E-04	8.2E-05	1.7E-03	3.0E-04	3.0E-04	1.0E-02	3.6E-01	2.7E-01	1.7E-01	0.81
										HI	**7.3**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-97

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Beryllium	0.04	4.6E-05	4.6E-07	Inc	2.0E-03	2.0E-03	5.7E-06	2.3E-02	2.3E-04	Inc	0.023
Cadmium	0.06	6.8E-05	6.8E-07	Inc	5.0E-04	5.0E-04	5.0E-04	1.4E-01	1.4E-03	Inc	0.14
Copper	0.50	5.7E-04	5.7E-06	Inc	3.7E-02	3.7E-02	3.7E-02	1.5E-02	1.5E-04	Inc	0.016
Lead	0.53	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.004	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.42	4.8E-04	9.6E-07	Inc	2.0E-02	2.0E-02	2.0E-02	2.4E-02	4.8E-05	Inc	0.024
Zinc	1.5	1.7E-03	1.7E-05	Inc	3.0E-01	3.0E-01	3.0E-01	5.7E-03	5.7E-05	Inc	0.0058
VOLATILE ORGANIC COMPOUNDS											
4-Isopropyltoluene	0.0066	7.5E-06	9.0E-06	4.7E-05	1.0E-01	1.0E-01	1.1E-01	7.5E-05	9.0E-05	4.3E-04	0.00059
bis(2-ethylexyl)phthalate	0.0170	1.9E-05	4.9E-06	2.9E-09	2.0E-02	2.0E-02	2.0E-02	9.7E-04	2.4E-04	1.4E-07	0.0012
n-Propylbenzene	0.0043	4.9E-06	1.5E-05	3.6E-05	4.0E-02	4.0E-02	4.0E-02	1.2E-04	3.7E-04	8.9E-04	0.0014
sec-Butylbenzene	0.0040	4.6E-06	3.7E-06	4.7E-05	4.0E-02	4.0E-02	4.0E-02	1.1E-04	9.1E-05	1.2E-03	0.0014
Trichloroethene	0.0033	3.8E-06	5.9E-07	2.2E-05	3.0E-04	3.0E-04	1.0E-02	1.3E-02	2.0E-03	2.2E-03	0.017
										HI	**0.21**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-97

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 16 - Paint and Dope Storage Building - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-98

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Cadmium	2.2	8.7E-07	3.4E-09	6.3E-11	na	na	6.3E+00	na	na	4.0E-10	4.0E-10
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	3.0E-07	0.0E+00	2.2E-11	5.5E-02	5.5E-02	2.9E-02	1.6E-08	0.0E+00	6.3E-13	1.6E-08
Ethylbenzene	3.0	1.2E-06	0.0E+00	8.8E-11	3.9E-03	3.9E-03	3.9E-03	4.7E-09	0.0E+00	3.4E-13	4.7E-09
										ILCR	**2E-08**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-99

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Cadmium	2.2	2.6E-06	1.0E-08	1.9E-10	na	na	6.3E+00	na	na	1.2E-09	1.2E-09
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	8.9E-07	0.0E+00	6.5E-11	5.5E-02	5.5E-02	2.7E-02	4.9E-08	0.0E+00	1.8E-12	4.9E-08
Ethylbenzene	3.0	3.6E-06	0.0E+00	2.6E-10	3.9E-03	3.9E-03	3.9E-03	1.4E-08	0.0E+00	1.0E-12	1.4E-08
										ILCR	**6E-08**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-100

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Cadmium	2.2	2.1E-08	2.8E-10	6.5E-12	na	na	6.3E+00	na	na	4.1E-11	4.1E-11
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	7.2E-09	0.0E+00	2.2E-12	5.5E-02	5.5E-02	2.7E-01	4.0E-10	0.0E+00	6.0E-13	4.0E-10
Ethylbenzene	3.0	2.9E-08	0.0E+00	9.0E-12	3.9E-03	3.9E-03	3.9E-03	1.1E-10	0.0E+00	3.5E-14	1.1E-10
										ILCR	**6E-10**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-101

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Cadmium	2.2	7.8E-06	2.5E-08	3.9E-10	5.0E-04	5.0E-04	5.0E-04	1.6E-02	5.0E-05	7.8E-07	0.016
Chromium	27	9.8E-05	0.0E+00	4.9E-09	1.5E+00	1.5E+00	1.5E+00	6.5E-05	0.0E+00	3.2E-09	0.000065
Lead	86	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	2.7E-06	0.0E+00	1.3E-10	4.0E-03	4.0E-03	8.6E-03	6.7E-04	0.0E+00	1.5E-08	0.00067
Ethylbenzene	3.0	1.1E-05	0.0E+00	5.4E-10	1.0E-01	1.0E-01	2.9E-01	1.1E-04	0.0E+00	1.9E-09	0.00011
m,p-xylene	0.11	4.0E-07	0.0E+00	2.0E-11	2.0E-01	2.0E-01	2.9E-02	2.0E-06	0.0E+00	6.9E-10	0.00000
Toluene	3.10	1.1E-05	0.0E+00	5.6E-10	2.0E-01	2.0E-01	1.1E-01	5.6E-05	0.0E+00	5.1E-09	0.000056
Xylenes	8.6	3.1E-05	0.0E+00	1.6E-09	2.0E-01	2.0E-01	2.9E-02	1.6E-04	0.0E+00	5.5E-08	0.00016
										HI	**0.017**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,640	3.9E-02	Inc	1.9E-06	1.0E-01	na	2.9E-01	3.9E-01	Inc	6.6E-06	0.39
Diesel Range Organics, Aromatic	5,320	1.9E-02	Inc	9.6E-07	4.0E-02	na	5.7E-01	4.8E-01	Inc	1.7E-06	0.48
Gasoline Range Organics	6,650	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4,655	1.7E-02	Inc	8.4E-07	5.0E+00	na	5.3E+00	3.4E-03	Inc	1.6E-07	0.0034
Gasoline Range Organics, Aromatic	3,325	1.2E-02	Inc	6.0E-07	2.0E-01	na	1.1E-01	6.1E-02	Inc	5.5E-06	0.061
										HI	**0.94**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-101

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-102

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Cadmium	2.2	2.3E-05	7.4E-08	1.2E-09	5.0E-04	5.0E-04	5.0E-04	4.7E-02	1.5E-04	2.3E-06	0.047
Chromium	27	2.9E-04	0.0E+00	1.5E-08	1.5E+00	1.5E+00	1.5E+00	2.0E-04	0.0E+00	9.7E-09	0.00020
Lead	86	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	8.0E-06	0.0E+00	4.0E-10	4.0E-03	4.0E-03	8.6E-03	2.0E-03	0.0E+00	4.6E-08	0.0020
Ethylbenzene	3.0	3.3E-05	0.0E+00	1.6E-09	1.0E-01	1.0E-01	2.9E-01	3.3E-04	0.0E+00	5.6E-09	0.00033
m,p-xylene	0.11	1.2E-06	0.0E+00	6.0E-11	2.0E-01	2.0E-01	2.9E-02	6.0E-06	0.0E+00	2.1E-09	0.00001
Toluene	3.1	3.4E-05	0.0E+00	1.7E-09	2.0E-01	2.0E-01	1.1E-01	1.7E-04	0.0E+00	1.5E-08	0.000169
Xylenes	8.6	9.4E-05	0.0E+00	4.7E-09	2.0E-01	2.0E-01	2.9E-02	4.7E-04	0.0E+00	1.6E-07	0.00047
										HI	**0.050**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,640	1.2E-01	Inc	5.8E-06	1.0E-01	na	2.9E-01	1.2E+00	Inc	2.0E-05	1.2
Diesel Range Organics, Aromatic	5,320	5.8E-02	Inc	2.9E-06	4.0E-02	na	5.7E-01	1.5E+00	Inc	5.1E-06	1.5
Gasoline Range Organics	6,650	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4,655	5.1E-02	Inc	2.5E-06	5.0E+00	na	5.3E+00	1.0E-02	Inc	4.8E-07	0.010
Gasoline Range Organics, Aromatic	3,325	3.6E-02	Inc	1.8E-06	2.0E-01	na	1.1E-01	1.8E-01	Inc	1.6E-05	0.18
										HI	**2.8**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-102

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-103

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Cadmium	2.2	6.1E-08	8.1E-10	1.9E-11	5.0E-04	5.0E-04	5.0E-04	1.2E-04	1.6E-06	3.8E-08	0.00012
Chromium	27	7.7E-07	0.0E+00	2.4E-10	1.5E+00	1.5E+00	1.5E+00	5.1E-07	0.0E+00	1.6E-10	0.00000051
Lead	86	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.74	2.1E-08	0.0E+00	6.5E-12	4.0E-03	4.0E-03	8.6E-03	5.3E-06	0.0E+00	7.5E-10	0.0000053
Ethylbenzene	3.0	8.6E-08	0.0E+00	2.6E-11	1.0E-01	1.0E-01	2.9E-01	8.6E-07	0.0E+00	9.1E-11	0.00000086
m,p-xylene	0.11	3.1E-09	0.0E+00	9.7E-13	2.0E-01	2.0E-01	2.9E-02	1.6E-08	0.0E+00	3.4E-11	0.000000016
Toluene	3.1	8.8E-08	0.0E+00	2.7E-11	2.0E-01	2.0E-01	1.1E-01	4.4E-07	0.0E+00	2.5E-10	0.00000044
Xylenes	8.6	2.5E-07	0.0E+00	7.6E-11	2.0E-01	2.0E-01	2.9E-02	1.2E-06	0.0E+00	2.6E-09	0.0000012
										HI	**0.00013**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,300	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,640	3.0E-04	Inc	9.3E-08	1.0E-01	na	2.9E-01	3.0E-03	Inc	3.2E-07	0.0030
Diesel Range Organics, Aromatic	5,320	1.5E-04	Inc	4.7E-08	4.0E-02	na	5.7E-01	3.8E-03	Inc	8.2E-08	0.0038
Gasoline Range Organics	6,650	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4,655	1.3E-04	Inc	4.1E-08	5.0E+00	na	5.3E+00	2.7E-05	Inc	7.7E-09	0.000027
Gasoline Range Organics, Aromatic	3,325	9.5E-05	Inc	2.9E-08	2.0E-01	na	1.1E-01	4.7E-04	Inc	2.7E-07	0.00047
										HI	**0.0073**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-103

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-104

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	9.6E-05	2.7E-05	2.9E-04	5.5E-02	5.5E-02	2.7E-02	5.3E-06	1.5E-06	7.7E-06	1.4E-05
										ILCR	**1E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-105

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg-d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	3.7E-04	1.1E-04	1.1E-03	5.5E-02	5.5E-02	2.7E-02	2.0E-05	5.8E-06	3.0E-05	5.6E-05
										ILCR	**6E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-106

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	9.8E-06	2.0E-06	2.9E-05	5.5E-02	5.5E-02	2.7E-02	5.4E-07	1.1E-07	7.9E-07	1.4E-06
										ILCR	**1E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.
na	Not available.

TABLE F-107

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Copper	0.20	1.7E-03	8.0E-05	Inc	3.7E-02	3.7E-02	3.7E-02	4.6E-02	2.2E-03	Inc	0.0479
Lead	0.42	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	2.1E-04	2.1E-04	2.9E-04	4.0E-03	4.0E-03	8.6E-03	5.3E-02	5.2E-02	3.3E-02	0.14
Ethane	0.0017	1.4E-05	nc	nc	na	na	na	na	na	na	0
										HI	**0.19**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	34	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	27	2.3E-01	Inc	1.5E-01	1.0E-01	na	2.9E-01	2.3E+00	Inc	5.3E-01	2.8
Diesel Range Organics, Aromatic	14	1.1E-01	Inc	7.7E-02	4.0E-02	na	5.7E-01	2.9E+00	Inc	1.3E-01	3.0
Gasoline Range Organics	6.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4.3	3.6E-02	Inc	4.8E-01	5.0E+00	na	5.3E+00	7.2E-03	Inc	9.0E-02	0.097
Gasoline Range Organics, Aromatic	3.1	2.6E-02	Inc	3.4E-01	2.0E-01	na	1.1E-01	1.3E-01	Inc	3.1E+00	3.2
Residual Range Organics	1.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	0.91	7.7E-03	Inc	5.3E-06	2.0E+00	na	na	3.8E-03	Inc	Inc	0.0038
Residual Range Organics, Aromatic	0.65	5.5E-03	Inc	3.8E-06	3.0E-02	na	na	1.8E-01	Inc	Inc	0.18
										HI	**9.3**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-107

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

[e] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-108

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Copper	0.20	6.6E-03	3.1E-04	Inc	3.7E-02	3.7E-02	3.7E-02	1.8E-01	8.4E-03	Inc	0.1861
Lead	0.42	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	8.2E-04	8.0E-04	1.1E-03	4.0E-03	4.0E-03	8.6E-03	2.1E-01	2.0E-01	1.3E-01	0.54
Ethane	0.0017	5.6E-05	nc	nc	na	na	na	na	na	na	0
										HI	**0.72**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	34	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	27	8.9E-01	Inc	6.0E-01	1.0E-01	na	2.9E-01	8.9E+00	Inc	2.1E+00	11
Diesel Range Organics, Aromatic	14	4.5E-01	Inc	3.0E-01	4.0E-02	na	5.7E-01	1.1E+01	Inc	5.2E-01	12
Gasoline Range Organics	6.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4.3	1.4E-01	Inc	1.9E+00	5.0E+00	na	5.3E+00	2.8E-02	Inc	3.5E-01	0.38
Gasoline Range Organics, Aromatic	3.1	1.0E-01	Inc	1.3E+00	2.0E-01	na	1.1E-01	5.0E-01	Inc	1.2E+01	13
Residual Range Organics	1.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	0.91	3.0E-02	Inc	2.1E-05	2.0E+00	na	na	1.5E-02	Inc	Inc	0.015
Residual Range Organics, Aromatic	0.65	2.1E-02	Inc	1.5E-05	3.0E-02	na	na	7.1E-01	Inc	Inc	0.71
										HI	**36**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-108

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-109

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Copper	0.20	2.3E-04	4.6E-06	Inc	1.5E+00	1.5E+00	1.5E+00	1.5E-04	3.0E-06	Inc	0.00016
Lead	0.42	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.025	2.9E-05	5.9E-06	2.9E-05	4.0E-03	4.0E-03	8.6E-03	7.1E-03	1.5E-03	3.4E-03	0.012
Ethane	0.0017	1.9E-06	nc	nc	na	na	na	na	na	na	0.0
										HI	**0.012**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	34	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	27	3.1E-02	Inc	7.5E-03	1.0E-01	na	2.9E-01	3.1E-01	Inc	2.6E-02	0.34
Diesel Range Organics, Aromatic	14	1.6E-02	Inc	3.7E-03	4.0E-02	na	5.7E-01	3.9E-01	Inc	6.5E-03	0.39
Gasoline Range Organics	6.1	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	4.3	4.9E-03	Inc	2.3E-02	5.0E+00	na	5.3E+00	9.7E-04	Inc	4.4E-03	0.0053
Gasoline Range Organics, Aromatic	3.1	3.5E-03	Inc	1.7E-02	2.0E-01	na	1.1E-01	1.7E-02	Inc	1.5E-01	0.17
Residual Range Organics	1.3	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	0.91	1.0E-03	Inc	2.6E-07	2.0E+00	na	na	5.2E-04	Inc	Inc	0.00052
Residual Range Organics, Aromatic	0.65	7.4E-04	Inc	1.9E-07	3.0E-02	na	na	2.5E-02	Inc	Inc	0.025
										HI	**0.93**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-109

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 19 - Auto Maintenance and Storage Facilities - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure does and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-110

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	28	1.1E-05	1.3E-06	8.2E-10	1.5E+00	1.5E+00	1.5E+01	1.7E-05	2.0E-06	1.2E-08	1.9E-05
Cadmium	5.2	2.1E-06	8.2E-09	1.5E-10	na	na	6.3E+00	na	na	9.6E-10	9.6E-10
Cobalt	12	4.8E-06	0.0E+00	3.5E-10	na	na	9.8E+00	na	na	3.5E-09	3.5E-09
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.006	2.4E-09	0.0E+00	1.8E-13	7.5E-03	7.5E-03	1.6E-03	1.8E-11	0.0E+00	2.9E-16	1.8E-11
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	9.7E-07	5.3E-07	7.1E-11	2.0E+00	2.0E+00	2.0E+00	1.9E-06	1.1E-06	1.4E-10	3.0E-06
										ILCR	**2E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

[b] Total polychlorinated biphenyls were not included in the cummulative ILCR because measurements of individual Aroclors are available.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-111

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	28	3.4E-05	4.0E-06	2.5E-09	1.5E+00	1.5E+00	1.5E+01	5.1E-05	6.0E-06	3.7E-08	5.7E-05
Cadmium	5.2	6.3E-06	2.5E-08	4.6E-10	na	na	6.3E+00	na	na	2.9E-09	2.9E-09
Cobalt	12	1.4E-05	0.0E+00	1.1E-09	na	na	9.8E+00	na	na	1.0E-08	1.0E-08
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.0060	7.2E-09	0.0E+00	5.3E-13	7.5E-03	7.5E-03	1.6E-03	5.4E-11	0.0E+00	8.7E-16	5.4E-11
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	2.9E-06	1.6E-06	2.1E-10	2.0E+00	2.0E+00	2.0E+00	5.8E-06	3.2E-06	4.2E-10	9.0E-06
										ILCR	**7E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

[b] Total polychlorinated biphenyls were not included in the cummulative ILCR because measurements of individual Aroclors are available.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-112

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	28	2.7E-07	1.1E-07	8.4E-11	1.5E+00	1.5E+00	1.5E+01	4.1E-07	1.6E-07	1.3E-09	5.7E-07
Cadmium	5.2	5.1E-08	6.7E-10	1.6E-11	na	na	6.3E+00	na	na	9.9E-11	9.9E-11
Cobalt	12	1.2E-07	0.0E+00	3.6E-11	na	na	9.8E+00	na	na	3.5E-10	3.5E-10
VOLATILE ORGANIC COMPOUNDS											
Methylene chloride	0.006	5.9E-11	0.0E+00	1.8E-14	7.5E-03	7.5E-03	1.6E-03	4.4E-13	0.0E+00	3.0E-17	4.4E-13
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	2.3E-08	4.3E-08	7.2E-12	2.0E+00	2.0E+00	2.0E+00	4.7E-08	8.7E-08	1.4E-11	1.3E-07
										ILCR	**7E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

[b] Total polychlorinated biphenyls were not included in the cummulative ILCR because measurements of individual Aroclors are available.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-113

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Aluminum	21,708	7.9E-02	0.0E+00	3.9E-06	1.0E+00	1.0E+00	1.4E-03	7.9E-02	0.0E+00	2.8E-03	0.082
Antimony	9.7	3.5E-05	0.0E+00	1.7E-09	4.0E-04	4.0E-04	4.0E-04	8.8E-02	0.0E+00	4.4E-06	0.088
Arsenic	28	1.0E-04	9.7E-06	5.1E-09	3.0E-04	3.0E-04	3.0E-04	3.4E-01	3.2E-02	1.7E-05	0.37
Barium	141	5.1E-04	0.0E+00	2.5E-08	7.0E-02	7.0E-02	1.4E-04	7.3E-03	0.0E+00	1.8E-04	0.0075
Cadmium	5.2	1.9E-05	6.0E-08	9.4E-10	5.0E-04	5.0E-04	5.0E-04	3.8E-02	1.2E-04	1.9E-06	0.04
Chromium	44	1.6E-04	0.0E+00	7.9E-09	1.5E+00	1.5E+00	1.5E+00	1.1E-04	0.0E+00	5.3E-09	0.00011
Cobalt	12	4.3E-05	0.0E+00	2.1E-09	2.0E-02	2.0E-02	5.7E-06	2.1E-03	0.0E+00	3.7E-04	0.0025
Manganese	561	2.0E-03	0.0E+00	1.0E-07	1.4E-01	1.4E-01	1.4E-05	1.5E-02	0.0E+00	7.2E-03	0.022
Mercury	0.76	2.8E-06	0.0E+00	1.4E-10	3.0E-04	3.0E-04	3.0E-04	9.2E-03	0.0E+00	4.6E-07	0.009
Selenium	2.0	7.3E-06	0.0E+00	3.6E-10	5.0E-03	5.0E-03	5.0E-03	1.5E-03	0.0E+00	7.2E-08	0.0015
Silver	2.1	7.6E-06	0.0E+00	3.8E-10	5.0E-03	5.0E-03	5.0E-03	1.5E-03	0.0E+00	7.6E-08	0.0015
Thallium	0.53	1.9E-06	0.0E+00	9.6E-11	7.0E-05	7.0E-05	7.0E-05	2.8E-02	0.0E+00	1.4E-06	0.028
Vanadium	56	2.0E-04	0.0E+00	1.0E-08	7.0E-03	7.0E-03	7.0E-03	2.9E-02	0.0E+00	1.4E-06	0.029
Zinc	480	1.7E-03	0.0E+00	8.7E-08	3.0E-01	3.0E-01	3.0E-01	5.8E-03	0.0E+00	2.9E-07	0.0058
VOLATILE ORGANIC COMPOUNDS											
1,2,4-Trimethylbenzene	0.19	6.9E-07	0.0E+00	3.4E-11	5.0E-02	5.0E-02	1.7E-03	1.4E-05	0.0E+00	2.0E-08	0.000014
m,p-Xylene	0.048	1.7E-07	0.0E+00	8.6E-12	2.0E-01	2.0E-01	2.9E-02	8.7E-07	0.0E+00	3.0E-10	0.00000087
Methylene chloride	0.006	2.2E-08	0.0E+00	1.1E-12	6.0E-02	6.0E-02	8.6E-01	3.6E-07	0.0E+00	1.3E-12	0.00000036
n-Butylbenzene	0.062	2.3E-07	0.0E+00	1.1E-11	4.0E-02	4.0E-02	4.0E-02	5.6E-06	0.0E+00	2.8E-10	0.0000056
n-Propylbenzene	0.04	1.5E-07	0.0E+00	7.2E-12	4.0E-02	4.0E-02	4.0E-02	3.6E-06	0.0E+00	1.8E-10	0.0000036
o-Xylene	0.006	2.2E-08	0.0E+00	1.1E-12	2.0E-01	2.0E-01	2.9E-02	1.1E-07	0.0E+00	3.7E-11	0.000000022
sec-Butylbenzene	0.036	1.3E-07	0.0E+00	6.5E-12	4.0E-02	4.0E-02	4.0E-02	3.3E-06	0.0E+00	1.6E-10	0.00000013
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Chloroaniline	5.5	2.0E-05	6.3E-06	9.9E-10	4.0E-03	4.0E-03	4.0E-03	5.0E-03	1.6E-03	2.5E-07	0.0066
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	8.7E-06	3.9E-06	4.3E-10	2.0E-05	2.0E-05	2.0E-05	4.4E-01	1.9E-01	2.2E-05	0.63
										HI	**1.3**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3,800	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,040	1.1E-02	Inc	5.5E-07	1.0E-01	na	2.9E-01	1.1E-01	Inc	1.9E-06	0.11
Diesel Range Organics, Aromatic	1,520	5.5E-03	Inc	2.7E-07	4.0E-02	na	5.7E-01	1.4E-01	Inc	4.8E-07	0.14
Residual Range Organics	2,384	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2,146	7.8E-03	Inc	3.9E-07	2.0E+00	na	na	3.9E-03	Inc	Inc	0.0039

TABLE F-113

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
Residual Range Organics, Aromatic	715	2.6E-03	Inc	1.3E-07	3.0E-02	na	na	8.7E-02	Inc	Inc	0.087
										HI	**0.34**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-114

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	21,708	2.4E-01	0.0E+00	1.2E-05	1.0E+00	1.0E+00	1.4E-03	2.4E-01	0.0E+00	8.4E-03	0.25
Antimony	9.7	1.1E-04	0.0E+00	5.2E-09	4.0E-04	4.0E-04	4.0E-04	2.6E-01	0.0E+00	1.3E-05	0.26
Arsenic	28	3.1E-04	2.9E-05	1.5E-08	3.0E-04	3.0E-04	3.0E-04	1.0E+00	9.7E-02	5.1E-05	1.1
Barium	141	1.5E-03	0.0E+00	7.6E-08	7.0E-02	7.0E-02	1.4E-04	2.2E-02	0.0E+00	5.5E-04	0.023
Cadmium	5.2	5.7E-05	1.8E-07	2.8E-09	5.0E-04	5.0E-04	5.0E-04	1.1E-01	3.6E-04	5.6E-06	0.11
Chromium	44	4.8E-04	0.0E+00	2.4E-08	1.5E+00	1.5E+00	1.5E+00	3.2E-04	0.0E+00	1.6E-08	0.00032
Cobalt	12	1.3E-04	0.0E+00	6.3E-09	6.0E-02	6.0E-02	6.0E-02	2.1E-03	0.0E+00	1.1E-07	0.0021
Manganese	561	6.1E-03	0.0E+00	3.0E-07	1.4E-01	1.4E-01	1.4E-05	4.4E-02	0.0E+00	2.2E-02	0.065
Mercury	0.76	8.3E-06	0.0E+00	4.1E-10	3.0E-04	3.0E-04	3.0E-04	2.8E-02	0.0E+00	1.4E-06	0.028
Selenium	2.0	2.2E-05	0.0E+00	1.1E-09	5.0E-03	5.0E-03	5.0E-03	4.4E-03	0.0E+00	2.2E-07	0.0044
Silver	2.1	2.3E-05	0.0E+00	1.1E-09	5.0E-03	5.0E-03	5.0E-03	4.6E-03	0.0E+00	2.3E-07	0.0046
Thallium	0.53	5.8E-06	0.0E+00	2.9E-10	6.6E-05	6.6E-05	6.6E-05	8.8E-02	0.0E+00	4.4E-06	0.088
Vanadium	56	6.1E-04	0.0E+00	3.0E-08	7.0E-03	7.0E-03	7.0E-03	8.7E-02	0.0E+00	4.3E-06	0.087
Zinc	480	5.2E-03	0.0E+00	2.6E-07	3.0E-01	3.0E-01	3.0E-01	1.7E-02	0.0E+00	8.7E-07	0.017
VOLATILE ORGANIC COMPOUNDS											
1,2,4-Trimethylbenzene	0.19	2.1E-06	0.0E+00	1.0E-10	5.0E-02	5.0E-02	1.7E-03	4.1E-05	0.0E+00	6.1E-08	0.000042
m,p-Xylene	0.048	5.2E-07	0.0E+00	2.6E-11	2.0E-01	2.0E-01	2.9E-02	2.6E-06	0.0E+00	8.9E-10	0.0000026
Methylene chloride	0.006	6.6E-08	0.0E+00	3.3E-12	6.0E-02	6.0E-02	8.6E-01	1.1E-06	0.0E+00	3.8E-12	0.0000011
n-Butylbenzene	0.062	6.8E-07	0.0E+00	3.4E-11	4.0E-02	4.0E-02	4.0E-02	6.8E-07	6.8E-07	6.8E-07	0.00000068
n-Propylbenzene	0.04	4.4E-07	0.0E+00	2.2E-11	4.0E-02	4.0E-02	4.0E-02	4.4E-07	4.4E-07	4.4E-07	0.00000044
o-Xylene	0.006	6.6E-08	0.0E+00	3.3E-12	2.0E-01	2.0E-01	2.9E-02	6.6E-08	6.6E-08	6.6E-08	0.000000066
sec-Butylbenzene	0.036	3.9E-07	0.0E+00	2.0E-11	4.0E-02	4.0E-02	4.0E-02	3.9E-07	3.9E-07	3.9E-07	0.00000039
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Chloroaniline	5.5	6.0E-05	1.9E-05	3.0E-09	4.0E-03	4.0E-03	4.0E-03	1.5E-02	4.7E-03	7.4E-07	0.020
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	2.6E-05	1.2E-05	1.3E-09	2.0E-05	2.0E-05	2.0E-05	1.3E+00	5.8E-01	6.5E-05	1.9
										HI	**4.0**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3,800	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,040	3.3E-02	Inc	1.6E-06	1.0E-01	na	2.9E-01	3.3E-01	Inc	5.7E-06	0.3

TABLE F-114

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
Diesel Range Organics, Aromatic	1,520	1.7E-02	Inc	8.2E-07	4.0E-02	na	5.7E-01	4.1E-01	Inc	1.4E-06	0.4
Residual Range Organics	2,384	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2,146	2.3E-02	Inc	1.2E-06	2.0E+00	na	na	1.2E-02	Inc	Inc	0.012
Residual Range Organics, Aromatic	715	7.8E-03	Inc	3.9E-07	3.0E-02	na	na	2.6E-01	Inc	Inc	0.26
										HI	**1.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-115

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Aluminum	21,708	6.2E-04	0.0E+00	1.9E-07	1.0E+00	1.0E+00	1.4E-03	6.2E-04	0.0E+00	1.4E-04	0.00076
Antimony	9.7	2.8E-07	0.0E+00	8.5E-11	4.0E-04	4.0E-04	4.0E-04	6.9E-04	0.0E+00	2.1E-07	0.00069
Arsenic	28	8.0E-07	3.2E-07	2.5E-10	3.0E-04	3.0E-04	3.0E-04	2.7E-03	1.1E-03	8.2E-07	0.0037
Barium	141	4.0E-06	0.0E+00	1.2E-09	7.0E-02	7.0E-02	1.4E-04	5.7E-05	0.0E+00	8.8E-06	0.000066
Cadmium	5.2	1.5E-07	2.0E-09	4.6E-11	5.0E-04	5.0E-04	5.0E-04	3.0E-04	3.9E-06	9.1E-08	0.00030
Chromium	44	1.3E-06	0.0E+00	3.9E-10	1.5E+00	1.5E+00	1.5E+00	8.4E-07	0.0E+00	2.6E-10	0.00000084
Cobalt	12	3.3E-07	0.0E+00	1.0E-10	6.0E-02	6.0E-02	6.0E-02	5.6E-06	0.0E+00	1.7E-09	0.0000056
Manganese	561	1.6E-05	0.0E+00	4.9E-09	1.4E-01	1.4E-01	1.4E-05	1.1E-04	0.0E+00	3.5E-04	0.00047
Mercury	0.76	2.2E-08	0.0E+00	6.7E-12	3.0E-04	3.0E-04	3.0E-04	7.2E-05	0.0E+00	2.2E-08	0.000072
Selenium	2.0	5.7E-08	0.0E+00	1.8E-11	5.0E-03	5.0E-03	5.0E-03	1.1E-05	0.0E+00	3.5E-09	0.000011
Silver	2.1	6.0E-08	0.0E+00	1.8E-11	5.0E-03	5.0E-03	5.0E-03	1.2E-05	0.0E+00	3.7E-09	0.000012
Thallium	0.53	1.5E-08	0.0E+00	4.7E-12	6.6E-05	6.6E-05	6.6E-05	2.3E-04	0.0E+00	7.1E-08	0.00023
Vanadium	56	1.6E-06	0.0E+00	4.9E-10	7.0E-03	7.0E-03	7.0E-03	2.3E-04	0.0E+00	7.0E-08	0.00023
Zinc	480	1.4E-05	0.0E+00	4.2E-09	3.0E-01	3.0E-01	3.0E-01	4.6E-05	0.0E+00	1.4E-08	0.000046
VOLATILE ORGANIC COMPOUNDS											
1,2,4-Trimethylbenzene	0.19	5.4E-09	0.0E+00	1.7E-12	5.0E-02	5.0E-02	1.7E-03	1.1E-07	0.0E+00	9.8E-10	0.00000011
m,p-Xylene	0.048	1.4E-09	0.0E+00	4.2E-13	2.0E-01	2.0E-01	2.9E-02	6.8E-09	0.0E+00	1.4E-11	0.000000007
Methylene chloride	0.006	1.7E-10	0.0E+00	5.3E-14	6.0E-02	6.0E-02	8.6E-01	2.9E-09	0.0E+00	6.1E-14	0.0000000029
n-Butylbenzene	0.062	1.8E-09	0.0E+00	5.4E-13	4.0E-02	4.0E-02	4.0E-02	4.4E-08	0.0E+00	1.4E-11	0.000000044
n-Propylbenzene	0.04	1.1E-09	0.0E+00	3.5E-13	4.0E-02	4.0E-02	4.0E-02	2.9E-08	0.0E+00	8.8E-12	0.000000029
o-Xylene	0.006	1.7E-10	0.0E+00	5.3E-14	2.0E-01	2.0E-01	2.9E-02	8.6E-10	0.0E+00	1.8E-12	0.00000000086
sec-Butylbenzene	0.036	1.0E-09	0.0E+00	3.2E-13	4.0E-02	4.0E-02	4.0E-02	2.6E-08	0.0E+00	7.9E-12	0.000000026
SEMIVOLATILE ORGANIC COMPOUNDS											
4-Chloroaniline	5.5	1.6E-07	2.1E-07	4.8E-11	4.0E-03	4.0E-03	4.0E-03	3.9E-05	5.2E-05	1.2E-08	0.000091
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	2.4	6.8E-08	1.3E-07	2.1E-11	2.0E-05	2.0E-05	2.0E-05	3.4E-03	6.3E-03	1.1E-06	0.010
										HI	**0.016**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3,800	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,040	8.7E-05	Inc	2.7E-08	1.0E-01	na	2.9E-01	8.7E-04	Inc	9.2E-08	0.00087
Diesel Range Organics, Aromatic	1,520	4.3E-05	Inc	1.3E-08	4.0E-02	na	5.7E-01	1.1E-03	Inc	2.3E-08	0.0011
Residual Range Organics	2,384	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]

TABLE F-115

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
Residual Range Organics, Aliphatic	2,146	6.1E-05	Inc	1.9E-08	2.0E+00	na	na	3.1E-05	Inc	Inc	0.000031
Residual Range Organics, Aromatic	715	2.0E-05	Inc	6.3E-09	3.0E-02	na	na	6.8E-04	Inc	Inc	0.00068
										HI	**0.0027**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-116

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.072	2.8E-04	3.8E-06	Inc	1.5E+00	1.5E+00	1.5E+01	4.1E-04	5.7E-06	Inc	4.2E-04
										ILCR	**4E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-117

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Ingestion	Dermal	VOC Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	0.072	1.1E-03	1.5E-05	Inc	1.5E+00	1.5E+00	1.5E+01	1.6E-03	2.2E-05	Inc	1.6E-03
										ILCR	**2E-03**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-118

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.072	2.8E-05	2.8E-07	Inc	1.5E+00	1.5E+00	1.5E+01	4.2E-05	4.2E-07	Inc	4.3E-05
										ILCR	**4E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-119

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.072	6.1E-04	2.9E-05	Inc	3.0E-04	3.0E-04	3.0E-04	2.0E+00	9.6E-02	Inc	2.1
Copper	0.26	2.2E-03	1.0E-04	Inc	3.7E-02	3.7E-02	3.7E-02	5.9E-02	2.8E-03	Inc	0.062
Lead	0.26	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Mercury	0.0006	5.1E-06	2.4E-07	Inc	3.0E-04	3.0E-04	8.0E-06	1.7E-02	8.0E-04	Inc	0.018
Nickel	0.18	1.5E-03	1.4E-05	Inc	2.0E-02	2.0E-02	2.0E-02	7.6E-02	7.2E-04	Inc	0.077
Zinc	5.1	4.3E-02	2.0E-03	Inc	3.0E-01	3.0E-01	3.0E-01	1.4E-01	6.8E-03	Inc	0.15
VOLATILE ORGANIC COMPOUNDS											
n-Propylbenzene	0.0011	9.3E-06	1.4E-04	1.9E-04	4.0E-02	4.0E-02	4.0E-02	2.3E-04	3.4E-03	4.7E-03	0.0083
										HI	**2.4**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.0	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.80	6.8E-03	Inc	4.5E-03	1.0E-01	na	2.9E-01	6.8E-02	Inc	1.6E-02	0.083
Diesel Range Organics, Aromatic	0.40	3.4E-03	Inc	2.3E-03	4.0E-02	na	5.7E-01	8.5E-02	Inc	4.0E-03	0.088
										HI	**0.17**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-119

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-120

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.072	2.4E-03	1.1E-04	Inc	3.0E-04	3.0E-04	3.0E-04	7.9E+00	3.7E-01	Inc	8.3
Copper	0.26	8.5E-03	4.0E-04	Inc	3.7E-02	3.7E-02	3.7E-02	2.3E-01	1.1E-02	Inc	0.24
Lead	0.26	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Mercury	0.00060	2.0E-05	9.3E-07	Inc	3.0E-04	3.0E-04	8.0E-06	6.6E-02	3.1E-03	Inc	0.069
Nickel	0.18	5.9E-03	5.6E-05	Inc	2.0E-02	2.0E-02	2.0E-02	3.0E-01	2.8E-03	Inc	0.30
Zinc	5.1	1.7E-01	7.9E-03	Inc	3.0E-01	3.0E-01	3.0E-01	5.6E-01	2.6E-02	Inc	0.59
VOLATILE ORGANIC COMPOUNDS											
n-Propylbenzene	0.0011	3.6E-05	5.3E-04	7.3E-04	4.0E-02	4.0E-02	4.0E-02	9.0E-04	1.3E-02	1.8E-02	0.032
										HI	**9.5**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.0	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.80	2.6E-02	Inc	1.8E-02	1.0E-01	na	2.9E-01	2.6E-01	Inc	6.0E-02	0.32
Diesel Range Organics, Aromatic	0.40	1.3E-02	Inc	8.8E-03	4.0E-02	na	5.7E-01	3.3E-01	Inc	1.5E-02	0.34
										HI	**0.67**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-120

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-121

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Arsenic	0.072	8.2E-05	8.2E-07	Inc	3.0E-04	3.0E-04	3.0E-04	2.7E-01	2.7E-03	Inc	0.28
Copper	0.26	3.0E-04	3.0E-06	Inc	3.7E-02	3.7E-02	3.7E-02	8.0E-03	8.0E-05	Inc	0.0081
Lead	0.26	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Mercury	0.0006	6.8E-07	6.8E-09	Inc	3.0E-04	3.0E-04	8.0E-06	2.3E-03	2.3E-05	Inc	0.0023
Nickel	0.18	2.1E-04	4.1E-07	Inc	2.0E-02	2.0E-02	2.0E-02	1.0E-02	2.1E-05	Inc	0.010
Zinc	5.1	5.8E-03	5.8E-05	Inc	3.0E-01	3.0E-01	3.0E-01	1.9E-02	1.9E-04	Inc	0.020
VOLATILE ORGANIC COMPOUNDS											
n-Propylbenzene	0.0011	1.3E-06	3.9E-06	9.1E-06	4.0E-02	4.0E-02	4.0E-02	3.1E-05	9.7E-05	2.3E-04	0.00036
										HI	**0.32**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.0	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.80	9.1E-04	Inc	2.2E-04	1.0E-01	na	2.9E-01	9.1E-03	Inc	7.6E-04	0.0099
Diesel Range Organics, Aromatic	0.40	4.6E-04	Inc	1.1E-04	4.0E-02	na	5.7E-01	1.1E-02	Inc	1.9E-04	0.012
										HI	**0.021**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-121

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 21 - Wastewater Treatment Facility - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-122

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)pyrene	0.079	3.2E-08	1.6E-08	2.3E-12	7.3E+00	7.3E+00	7.3E+00	2.3E-07	1.2E-07	1.7E-11	3.5E-07
										ILCR	**3E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-123

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)pyrene	0.079	9.5E-08	4.9E-08	6.9E-12	7.3E+00	7.3E+00	7.3E+00	6.9E-07	3.6E-07	5.1E-11	1.0E-06
										ILCR	**1E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-124

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)pyrene	0.079	7.7E-10	1.3E-09	2.4E-13	7.3E+00	7.3E+00	7.3E+00	5.6E-09	9.6E-09	1.7E-12	1.5E-08
										ILCR	**2E-08**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-125

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	497	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
o-Xylene	0.37	1.4E-06	0.0E+00	6.7E-11	2.0E-01	2.0E-01	2.9E-02	6.8E-06	0.0E+00	2.3E-09	0.0000068
										HI	**0.0000068**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	4,070	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,256	1.2E-02	Inc	5.9E-07	1.0E-01	na	2.9E-01	1.2E-01	Inc	2.0E-06	0.12
Diesel Range Organics, Aromatic	1,628	5.9E-03	Inc	2.9E-07	4.0E-02	na	5.7E-01	1.5E-01	Inc	5.2E-07	0.15
Gasoline Range Organics	38	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	27	9.8E-05	Inc	4.9E-09	5.0E+00	na	5.3E+00	2.0E-05	Inc	9.2E-10	2.0E-05
Gasoline Range Organics, Aromatic	19	7.0E-05	Inc	3.5E-09	2.0E-01	na	1.1E-01	3.5E-04	Inc	3.2E-08	0.00034992
Residual Range Organics	3,815	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,434	1.2E-02	Inc	6.2E-07	2.0E+00	na	na	6.2E-03	Inc	Inc	0.0062
Residual Range Organics, Aromatic	1,145	4.2E-03	Inc	2.1E-07	3.0E-02	na	na	1.4E-01	Inc	Inc	0.14
										HI	**0.41**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-125

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-126

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Lead	497	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
o-Xylene	0.37	4.1E-06	0.0E+00	2.0E-10	2.0E-01	2.0E-01	2.9E-02	2.0E-05	0.0E+00	6.9E-09	0.000020
										HI	**0.000020**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	4,070	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,256	3.6E-02	Inc	1.8E-06	1.0E-01	na	2.9E-01	3.6E-01	Inc	6.1E-06	0.4
Diesel Range Organics, Aromatic	1,628	1.8E-02	Inc	8.8E-07	4.0E-02	na	5.7E-01	4.4E-01	Inc	1.5E-06	0.4
Gasoline Range Organics	38	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	26.915	2.9E-04	Inc	1.5E-08	5.0E+00	na	5.3E+00	5.9E-05	Inc	2.8E-09	0.000059
Gasoline Range Organics, Aromatic	19.225	2.1E-04	Inc	1.0E-08	2.0E-01	na	1.1E-01	1.0E-03	Inc	9.5E-08	0.0010
Residual Range Organics	3,815	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,434	3.7E-02	Inc	1.9E-06	2.0E+00	na	na	1.9E-02	Inc	Inc	0.019
Residual Range Organics, Aromatic	1,145	1.2E-02	Inc	6.2E-07	3.0E-02	na	na	4.2E-01	Inc	Inc	0.42
										HI	**1.2**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-126

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-127

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Lead	497	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
VOLATILE ORGANIC COMPOUNDS											
o-Xylene	0.37	1.1E-08	0.0E+00	3.3E-12	2.0E-01	2.0E-01	2.9E-02	5.3E-08	0.0E+00	1.1E-10	0.000000053
										HI	**0.000000053**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	4,070	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	3,256	9.3E-05	Inc	2.9E-08	1.0E-01	na	2.9E-01	9.3E-04	Inc	9.9E-08	0.00093
Diesel Range Organics, Aromatic	1,628	4.6E-05	Inc	1.4E-08	4.0E-02	na	5.7E-01	1.2E-03	Inc	2.5E-08	0.0012
Gasoline Range Organics	38	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	27	7.7E-07	Inc	2.4E-10	5.0E+00	na	5.3E+00	1.5E-07	Inc	4.5E-11	0.00000015
Gasoline Range Organics, Aromatic	19	5.5E-07	Inc	1.7E-10	2.0E-01	na	1.1E-01	2.7E-06	Inc	1.5E-09	0.0000027
Residual Range Organics	3,815	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,434	9.8E-05	Inc	3.0E-08	2.0E+00	na	na	4.9E-05	Inc	Inc	0.000049
Residual Range Organics, Aromatic	1,145	3.3E-05	Inc	1.0E-08	3.0E-02	na	na	1.1E-03	Inc	Inc	0.0011
										HI	**0.0032**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-127

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 22 - Water Wells and Water Supply Building - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-128

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Manganese	0.20	1.7E-03	8.1E-05	Inc	1.4E-01	1.4E-01	1.4E-05	1.2E-02	5.8E-04	Inc	0.013
Manganese, Dissolved	0.17	1.4E-03	6.6E-05	Inc	1.4E-01	1.4E-01	1.4E-05	1.0E-02	4.7E-04	Inc	0.010
										HI	**0.023**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.4	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	1.1	9.5E-03	Inc	6.3E-03	1.0E-01	na	2.9E-01	9.5E-02	Inc	2.2E-02	0.12
Diesel Range Organics, Aromatic	0.56	4.7E-03	Inc	3.2E-03	4.0E-02	na	5.7E-01	1.2E-01	Inc	5.5E-03	0.12
Residual Range Organics	2.8	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.5	2.1E-02	Inc	1.5E-05	2.0E+00	na	na	1.1E-02	Inc	Inc	0.011
Residual Range Organics, Aromatic	0.8	7.1E-03	Inc	4.9E-06	3.0E-02	na	na	2.4E-01	Inc	Inc	0.24
										HI	**0.49**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-128

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-129

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Manganese	0.20	6.7E-03	3.2E-04	Inc	1.4E-01	1.4E-01	1.4E-05	4.8E-02	2.3E-03	Inc	0.050
Manganese, Dissolved	0.17	5.4E-03	2.6E-04	Inc	1.4E-01	1.4E-01	1.4E-05	3.9E-02	1.8E-03	Inc	0.041
										HI	**0.091**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.4	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	1.1	3.7E-02	Inc	2.5E-02	1.0E-01	na	2.9E-01	3.7E-01	Inc	8.5E-02	0.45
Diesel Range Organics, Aromatic	0.56	1.8E-02	Inc	1.2E-02	4.0E-02	na	5.7E-01	4.6E-01	Inc	2.2E-02	0.48
Residual Range Organics	2.8	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.5	8.3E-02	Inc	5.8E-05	2.0E+00	na	na	4.1E-02	Inc	na	0.041
Residual Range Organics, Aromatic	0.8	2.8E-02	Inc	1.9E-05	3.0E-02	na	na	9.2E-01	Inc	na	0.92
										HI	**1.9**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-129

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-130

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Manganese	0.20	2.3E-04	2.3E-06	Inc	1.4E-01	1.4E-01	1.4E-05	1.7E-03	1.7E-05	Inc	0.0017
Manganese, Dissolved	0.17	1.9E-04	1.9E-06	Inc	1.4E-01	1.4E-01	1.4E-05	1.3E-03	1.3E-05	Inc	0.0014
										HI	**0.0030**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1.4	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	1.12	1.3E-03	Inc	3.1E-04	1.0E-01	na	2.9E-01	1.3E-02	Inc	1.1E-03	0.014
Diesel Range Organics, Aromatic	0.56	6.4E-04	Inc	1.5E-04	4.0E-02	na	5.7E-01	1.6E-02	Inc	2.7E-04	0.016
Residual Range Organics	2.8	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	2.5	2.9E-03	Inc	7.2E-07	2.0E+00	na	na	1.4E-03	Inc	Inc	0.0014
Residual Range Organics, Aromatic	0.8	9.6E-04	Inc	2.4E-07	3.0E-02	na	na	3.2E-02	Inc	Inc	0.032
										HI	**0.063**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-130

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 22 - Water Wells and Water Supply Building - DEEP SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-131

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fule Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	1.1E-07	0.0E+00	8.3E-12	5.5E-02	5.5E-02	2.7E-02	6.3E-09	0.0E+00	2.2E-13	6.3E-09
Ethylbenzene	8.1	3.3E-06	0.0E+00	2.4E-10	3.9E-03	3.9E-03	3.9E-03	1.3E-08	0.0E+00	9.3E-13	1.3E-08
										ILCR	**2E-08**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
   Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-132

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	3.4E-07	0.0E+00	2.5E-11	5.5E-02	5.5E-02	2.7E-02	1.9E-08	0.0E+00	6.7E-13	1.9E-08
Ethylbenzene	8.1	9.8E-06	0.0E+00	7.1E-10	3.9E-03	3.9E-03	3.9E-03	3.8E-08	0.0E+00	2.8E-12	3.8E-08
										ILCR	**6E-08**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-133

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	2.8E-09	0.0E+00	8.5E-13	5.5E-02	5.5E-02	2.7E-02	1.5E-10	0.0E+00	2.3E-14	1.5E-10
Ethylbenzene	8.1	7.9E-08	0.0E+00	2.4E-11	3.9E-03	3.9E-03	3.9E-03	3.1E-10	0.0E+00	9.5E-14	3.1E-10
										ILCR	**5E-10**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-134

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	1.0E-06	0.0E+00	5.1E-11	4.0E-03	4.0E-03	8.6E-03	2.6E-04	0.0E+00	5.9E-09	0.00026
Ethylbenzene	8.1	2.9E-05	0.0E+00	1.5E-09	1.0E-01	1.0E-01	2.9E-01	2.9E-04	0.0E+00	5.0E-09	0.00029
m,p-Xylene	25	9.2E-05	0.0E+00	4.6E-09	2.0E-01	2.0E-01	2.9E-02	4.6E-04	0.0E+00	1.6E-07	0.00046
o-Xylene	16	5.9E-05	0.0E+00	2.9E-09	2.0E-01	2.0E-01	2.9E-02	5.9E-05	5.9E-05	5.9E-05	0.000059
Toluene	7.6	2.7E-05	0.0E+00	1.4E-09	2.0E-01	2.0E-01	1.1E-01	1.4E-04	0.0E+00	1.2E-08	0.00014
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	191	7.0E-04	0.0E+00	3.5E-08	2.0E-02	2.0E-02	8.6E-04	3.5E-02	0.0E+00	4.0E-05	0.035
										HI	**0.036**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	51,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	40,800	1.5E-01	Inc	7.4E-06	1.0E-01	na	2.9E-01	1.5E+00	Inc	2.5E-05	1.5
Diesel Range Organics, Aromatic	20,400	7.4E-02	Inc	3.7E-06	4.0E-02	na	5.7E-01	1.9E+00	Inc	6.5E-06	1.9
Gasoline Range Organics	491	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	344	1.3E-03	Inc	6.2E-08	5.0E+00	na	5.3E+00	2.5E-04	Inc	1.2E-08	0.0002502
Gasoline Range Organics, Aromatic	246	8.9E-04	Inc	4.4E-08	2.0E-01	na	1.1E-01	4.5E-03	Inc	4.0E-07	0.0045
Residual Range Organics	3,459	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,113	1.1E-02	Inc	5.6E-07	2.0E+00	na	na	5.7E-03	Inc	Inc	0.0057
Residual Range Organics, Aromatic	1,038	3.8E-03	Inc	1.9E-07	3.0E-02	na	na	1.3E-01	Inc	Inc	0.13
										HI	**3.5**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-134

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-135

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	3.1E-06	0.0E+00	1.5E-10	4.0E-03	4.0E-03	8.6E-03	7.7E-04	0.0E+00	1.8E-08	0.00077
Ethylbenzene	8.1	8.8E-05	0.0E+00	4.4E-09	1.0E-01	1.0E-01	2.9E-01	8.8E-04	0.0E+00	1.5E-08	0.0009
m,p-Xylene	25	2.8E-04	0.0E+00	1.4E-08	2.0E-01	2.0E-01	2.9E-02	1.4E-03	0.0E+00	4.7E-07	0.0014
o-Xylene	16	1.8E-04	0.0E+00	8.8E-09	2.0E-01	2.0E-01	2.9E-02	8.9E-04	0.0E+00	3.0E-07	0.00089
Toluene	7.6	8.2E-05	0.0E+00	4.1E-09	2.0E-01	2.0E-01	1.1E-01	4.1E-04	0.0E+00	3.7E-08	0.00041
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	191	2.1E-03	8.6E-04	1.0E-07	2.0E-02	2.0E-02	8.6E-04	1.0E-01	4.3E-02	1.2E-04	0.15
										HI	**0.15**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	51,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	40,800	4.5E-01	Inc	2.2E-05	1.0E-01	na	2.9E-01	4.5E+00	Inc	7.6E-05	4.5
Diesel Range Organics, Aromatic	20,400	2.2E-01	Inc	1.1E-05	4.0E-02	na	5.7E-01	5.6E+00	Inc	1.9E-05	5.6
Gasoline Range Organics	491	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	344	3.8E-03	Inc	1.9E-07	5.0E+00	na	5.3E+00	7.5E-04	Inc	3.5E-08	0.00075
Gasoline Range Organics, Aromatic	246	2.7E-03	Inc	1.3E-07	2.0E-01	na	1.1E-01	1.3E-02	Inc	1.2E-06	0.013
Residual Range Organics	3,459	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,113	3.4E-02	Inc	1.7E-06	2.0E+00	na	na	1.7E-02	Inc	Inc	0.017
Residual Range Organics, Aromatic	1,038	1.1E-02	Inc	5.6E-07	3.0E-02	na	na	3.8E-01	Inc	Inc	0.38
										HI	**10**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-135

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-136

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.28	8.1E-09	0.0E+00	2.5E-12	4.0E-03	4.0E-03	8.6E-03	2.0E-06	0.0E+00	2.9E-10	0.0000020
Ethylbenzene	8.1	2.3E-07	0.0E+00	7.1E-11	1.0E-01	1.0E-01	2.9E-01	2.3E-06	0.0E+00	2.4E-10	0.0000023
m,p-Xylene	25	7.2E-07	0.0E+00	2.2E-10	2.0E-01	2.0E-01	2.9E-02	3.6E-06	0.0E+00	7.7E-09	0.0000036
o-Xylene	16	4.7E-07	0.0E+00	1.4E-10	2.0E-01	2.0E-01	2.9E-02	2.3E-06	0.0E+00	4.9E-09	0.0000023
Toluene	7.6	2.2E-07	0.0E+00	6.6E-11	2.0E-01	2.0E-01	1.1E-01	1.1E-06	0.0E+00	6.0E-10	0.0000011
POLYNUCLEAR AROMATIC HYDROCARBONS											
Naphthalene	191	5.5E-06	9.4E-06	1.7E-09	2.0E-02	2.0E-02	8.6E-04	2.7E-04	4.7E-04	2.0E-06	0.00074
										HI	**0.00075**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	51,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	40,800	1.2E-03	Inc	3.6E-07	1.0E-01	na	2.9E-01	1.2E-02	Inc	1.2E-06	0.012
Diesel Range Organics, Aromatic	20,400	5.8E-04	Inc	1.8E-07	4.0E-02	na	5.7E-01	1.5E-02	Inc	3.1E-07	0.015
Gasoline Range Organics	491	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	344	9.8E-06	Inc	3.0E-09	5.0E+00	na	5.3E+00	2.0E-06	Inc	5.7E-10	0.0000020
Gasoline Range Organics, Aromatic	246	7.0E-06	Inc	2.2E-09	2.0E-01	na	1.1E-01	3.5E-05	Inc	2.0E-08	0.000035
Residual Range Organics	3,459	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,113	8.9E-05	Inc	2.7E-08	2.0E+00	na	na	4.4E-05	Inc	Inc	4.4E-05
Residual Range Organics, Aromatic	1,038	3.0E-05	Inc	9.1E-09	3.0E-02	na	na	9.9E-04	Inc	Inc	0.00099
										HI	**0.027**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-136

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-137

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.030	1.1E-04	3.2E-05	3.4E-04	5.5E-02	5.5E-02	2.7E-02	6.3E-06	1.8E-06	9.3E-06	1.7E-05
Ethylbenzene	0.12	4.6E-04	4.6E-04	2.1E-03	3.9E-03	3.9E-03	3.9E-03	1.8E-06	1.8E-06	8.1E-06	1.2E-05
										ILCR	**3E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-138

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor $(mg/kg-d)^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.030	4.5E-04	1.3E-04	1.3E-03	5.5E-02	5.5E-02	2.7E-02	2.5E-05	7.0E-06	3.6E-05	6.8E-05
Ethylbenzene	0.12	1.8E-03	1.8E-03	8.0E-03	3.9E-03	3.9E-03	3.9E-03	7.0E-06	7.0E-06	3.1E-05	4.5E-05
										ILCR	**1E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-139

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.030	1.2E-05	2.4E-06	3.5E-05	5.5E-02	5.5E-02	2.7E-02	6.5E-07	1.3E-07	9.5E-07	1.7E-06
Ethylbenzene	0.12	4.7E-05	3.5E-05	2.1E-04	3.9E-03	3.9E-03	3.9E-03	1.8E-07	1.4E-07	8.2E-07	1.1E-06
										ILCR	**3E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-140

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Lead	0.19	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.0020	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.20	1.7E-03	8.1E-05	Inc	1.4E-01	1.4E-01	1.4E-05	1.2E-02	5.8E-04	Inc	0.013
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.03	2.5E-04	2.5E-04	2.1E-03	4.0E-03	4.0E-03	8.6E-03	6.3E-02	6.2E-02	2.5E-01	0.37
Ethylbenzene	0.12	1.0E-03	3.5E-03	1.3E-02	1.0E-01	1.0E-01	2.9E-01	1.0E-02	3.5E-02	4.4E-02	0.089
										HI	**0.47**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	64	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	51	4.3E-01	Inc	2.9E-01	1.0E-01	na	2.9E-01	4.3E+00	Inc	1.0E+00	5.3
Diesel Range Organics, Aromatic	26	2.2E-01	Inc	1.4E-01	4.0E-02	na	5.7E-01	5.4E+00	Inc	2.5E-01	5.7
Gasoline Range Organics	1.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	1.2	9.8E-03	Inc	1.3E-01	5.0E+00	na	5.3E+00	2.0E-03	Inc	2.4E-02	0.026
Gasoline Range Organics, Aromatic	0.83	7.0E-03	Inc	9.2E-02	2.0E-01	na	1.1E-01	3.5E-02	Inc	8.4E-01	0.87
Residual Range Organics	1.6	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	1.4	1.2E-02	Inc	8.5E-06	2.0E+00	na	na	6.1E-03	Inc	Inc	0.0061
Residual Range Organics, Aromatic	0.5	4.1E-03	Inc	2.8E-06	3.0E-02	na	na	1.4E-01	Inc	Inc	0.14
										HI	**12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-140

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-141

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Lead	0.19	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.0020	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.20	6.7E-03	3.2E-04	Inc	1.4E-01	1.4E-01	1.4E-05	4.8E-02	2.3E-03	Inc	0.050
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.03	9.9E-04	9.6E-04	1.3E-03	4.0E-03	4.0E-03	8.6E-03	2.5E-01	2.4E-01	1.6E-01	0.64
Ethylbenzene	0.12	3.9E-03	1.4E-02	8.0E-03	1.0E-01	1.0E-01	2.9E-01	3.9E-02	1.4E-01	2.8E-02	0.20
										HI	**0.90**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	64	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	51	1.7E+00	Inc	1.1E+00	1.0E-01	na	2.9E-01	1.7E+01	Inc	3.9E+00	21
Diesel Range Organics, Aromatic	26	8.4E-01	Inc	5.6E-01	4.0E-02	na	5.7E-01	2.1E+01	Inc	9.8E-01	22
Gasoline Range Organics	1.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	1.2	3.8E-02	Inc	5.0E-01	5.0E+00	na	5.3E+00	7.6E-03	Inc	9.5E-02	0.10
Gasoline Range Organics, Aromatic	0.83	2.7E-02	Inc	3.6E-01	2.0E-01	na	1.1E-01	1.4E-01	Inc	3.3E+00	3.4
Residual Range Organics	1.6	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	1.4	4.7E-02	Inc	3.3E-05	2.0E+00	na	na	2.4E-02	Inc	na	0.024
Residual Range Organics, Aromatic	0.5	1.6E-02	Inc	1.1E-05	3.0E-02	na	na	5.3E-01	Inc	na	0.53
										HI	**47**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-141

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-142

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Lead	0.19	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.002	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.20	2.3E-04	2.3E-06	Inc	1.4E-01	1.4E-01	1.4E-05	1.7E-03	1.7E-05	Inc	0.0017
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.03	3.4E-05	7.1E-06	1.0E-04	4.0E-03	4.0E-03	8.6E-03	8.6E-03	1.8E-03	1.2E-02	0.022
Ethylbenzene	0.12	1.4E-04	1.0E-04	6.2E-04	1.0E-01	1.0E-01	2.9E-01	1.4E-03	1.0E-03	2.1E-03	0.0045
										HI	**0.0017**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	64	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	51.2	5.8E-02	Inc	1.4E-02	1.0E-01	na	2.9E-01	5.8E-01	Inc	4.8E-02	0.63
Diesel Range Organics, Aromatic	25.6	2.9E-02	Inc	7.0E-03	4.0E-02	na	5.7E-01	7.3E-01	Inc	1.2E-02	0.74
Gasoline Range Organics	1.7	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	1.155	1.3E-03	Inc	6.3E-03	5.0E+00	na	5.3E+00	2.6E-04	Inc	1.2E-03	0.0014
Gasoline Range Organics, Aromatic	0.825	9.4E-04	Inc	4.5E-03	2.0E-01	na	1.1E-01	4.7E-03	Inc	4.1E-02	0.045
Residual Range Organics	1.6	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	1.4	1.6E-03	Inc	4.1E-07	2.0E+00	na	na	8.2E-04	Inc	Inc	0.00082
Residual Range Organics, Aromatic	0.5	5.5E-04	Inc	1.4E-07	3.0E-02	na	na	1.8E-02	Inc	Inc	0.018
										HI	**1.4**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-142

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 27 - Diesel Fuel Pump Island - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-143

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Beryllium	1.5	6.1E-07	0.0E+00	4.5E-11	na	na	8.4E+00	na	na	3.7E-10	3.7E-10
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.1	4.4E-07	0.0E+00	3.2E-11	3.9E-03	3.9E-03	3.9E-03	1.7E-09	0.0E+00	1.3E-13	1.7E-09
Methylene chloride	0.16	6.4E-08	0.0E+00	4.7E-12	7.5E-03	7.5E-03	1.6E-03	4.8E-10	0.0E+00	7.7E-15	4.8E-10
POLYCHLORINATED BIPHENYLS											
PCB-1254 (Aroclor 1254)	0.47	1.9E-07	1.0E-07	1.4E-11	2.0E+00	2.0E+00	2.0E+00	3.8E-07	2.1E-07	2.8E-11	5.9E-07
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)anthracene	4.4	1.8E-06	9.1E-07	1.3E-10	7.3E-01	7.3E-01	7.3E-01	1.3E-06	6.6E-07	9.4E-11	2.0E-06
Benzo(a)pyrene	2.3	9.3E-07	4.7E-07	6.8E-11	7.3E+00	7.3E+00	7.3E+00	6.8E-06	3.5E-06	4.9E-10	1.0E-05
Benzo(b)fluoranthene	2.6	1.0E-06	5.4E-07	7.6E-11	7.3E-01	7.3E-01	7.3E-01	7.6E-07	3.9E-07	5.6E-11	1.2E-06
										ILCR	**1E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-144

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Beryllium	1.5	1.5E-08	0.0E+00	4.6E-12	na	na	8.4E+00	na	na	3.8E-11	3.8E-11
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.1	1.1E-08	0.0E+00	3.3E-12	3.9E-03	3.9E-03	3.9E-03	4.2E-11	0.0E+00	1.3E-14	4.2E-11
Methylene chloride	0.16	1.6E-09	0.0E+00	4.8E-13	7.5E-03	7.5E-03	1.6E-03	1.2E-11	0.0E+00	7.9E-16	1.2E-11
POLYCHLORINATED BIPHENYLS											
PCB-1254 (Aroclor 1254)	0.47	4.6E-09	8.5E-09	1.4E-12	2.0E+00	2.0E+00	2.0E+00	9.2E-09	1.7E-08	2.8E-12	2.6E-08
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)anthracene	4.4	4.3E-08	8.0E-08	1.3E-11	7.3E-01	7.3E-01	7.3E-01	3.1E-08	5.8E-08	9.7E-12	9.0E-08
Benzo(a)pyrene	2.3	2.3E-08	4.2E-08	6.9E-12	7.3E+00	7.3E+00	7.3E+00	1.6E-07	3.0E-07	5.1E-11	4.7E-07
Benzo(b)fluoranthene	2.6	2.5E-08	4.7E-08	7.8E-12	7.3E-01	7.3E-01	7.3E-01	1.9E-08	3.4E-08	5.7E-12	5.3E-08
										ILCR	**6E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-145

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Beryllium	1.5	5.5E-06	0.0E+00	2.7E-10	2.0E-03	2.0E-03	5.7E-06	2.8E-03	0.0E+00	4.8E-05	0.0028
Thallium	0.26	9.5E-07	0.0E+00	4.7E-11	7.0E-05	7.0E-05	7.0E-05	1.4E-02	0.0E+00	6.7E-07	0.014
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.1	4.0E-06	0.0E+00	2.0E-10	1.0E-01	1.0E-01	2.9E-01	4.0E-05	0.0E+00	6.9E-10	0.000040
Methylene chloride	0.16	5.8E-07	0.0E+00	2.9E-11	6.0E-02	6.0E-02	8.6E-01	9.7E-06	0.0E+00	3.4E-11	0.000010
POLYCHLORINATED BIPHENYLS											
PCB-1254 (Aroclor 1254)	0.47	1.7E-06	7.6E-07	8.5E-11	2.0E-05	2.0E-05	2.0E-05	8.6E-02	3.8E-02	4.3E-06	0.12
										HI	**0.14**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	92,650	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	74,120	2.7E-01	Inc	1.3E-05	1.0E-01	na	2.9E-01	2.7E+00	Inc	4.6E-05	2.7
Diesel Range Organics, Aromatic	37,060	1.3E-01	Inc	6.7E-06	4.0E-02	na	5.7E-01	3.4E+00	Inc	1.2E-05	3.4
Gasoline Range Organics	120	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	84	3.1E-04	Inc	1.5E-08	5.0E+00	na	5.3E+00	6.1E-05	Inc	2.9E-09	0.000061
Gasoline Range Organics, Aromatic	60	2.2E-04	Inc	1.1E-08	2.0E-01	na	1.1E-01	1.1E-03	Inc	9.9E-08	0.0011
Residual Range Organics	2,073	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	1,866	6.8E-03	Inc	3.4E-07	2.0E+00	na	na	3.4E-03	Inc	Inc	0.0034
Residual Range Organics, Aromatic	622	2.3E-03	Inc	1.1E-07	3.0E-02	na	na	7.5E-02	Inc	Inc	0.075
										HI	**6.2**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-145

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-146

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
INORGANICS											
Beryllium	1.5	4.3E-08	0.0E+00	1.3E-11	2.0E-03	2.0E-03	5.7E-06	2.2E-05	0.0E+00	2.3E-06	0.000024
Thallium	0.26	7.4E-09	0.0E+00	2.3E-12	7.0E-05	7.0E-06	7.0E-05	1.1E-04	0.0E+00	3.3E-08	0.00011
VOLATILE ORGANIC COMPOUNDS											
Ethylbenzene	1.1	3.1E-08	0.0E+00	9.7E-12	1.0E-01	1.0E-01	2.9E-01	3.1E-07	0.0E+00	3.3E-11	0.00000031
Methylene chloride	0.16	4.6E-09	0.0E+00	1.4E-12	6.0E-02	6.0E-02	8.6E-01	7.6E-08	0.0E+00	1.6E-12	0.000000076
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.47	1.3E-08	2.5E-08	4.1E-12	2.0E-05	2.0E-05	2.0E-05	6.7E-04	1.2E-03	2.1E-07	0.0019
										HI	**0.0020**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	92,650	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	74,120	2.1E-03	Inc	6.5E-07	1.0E-01	na	2.9E-01	2.1E-02	Inc	2.2E-06	0.021
Diesel Range Organics, Aromatic	37,060	1.1E-03	Inc	3.3E-07	4.0E-02	na	5.7E-01	2.6E-02	Inc	5.7E-07	0.026
Gasoline Range Organics	120	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	84	2.4E-06	Inc	7.4E-10	5.0E+00	na	5.3E+00	4.8E-07	Inc	1.4E-10	0.00000048
Gasoline Range Organics, Aromatic	60	1.7E-06	Inc	5.3E-10	2.0E-01	na	1.1E-01	8.6E-06	Inc	4.8E-09	0.0000086
Residual Range Organics	2,073	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	1,866	5.3E-05	Inc	1.6E-08	2.0E+00	na	na	2.7E-05	Inc	Inc	0.000027
Residual Range Organics, Aromatic	622	1.8E-05	Inc	5.5E-09	3.0E-02	na	na	5.9E-04	Inc	Inc	0.00059
										HI	**0.048**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-146

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

[g] DRO_Aliphatic screened out during Tier I selection.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-147

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.050	2.0E-08	0.0E+00	1.5E-12	5.5E-02	5.5E-02	2.7E-02	1.1E-09	0.0E+00	4.0E-14	1.1E-09
Ethylbenzene	1.8	7.1E-07	0.0E+00	5.2E-11	3.9E-03	3.9E-03	3.9E-03	2.8E-09	0.0E+00	2.0E-13	2.8E-09
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)anthracene	1.5	6.2E-07	3.2E-07	4.5E-11	7.3E-01	7.3E-01	7.3E-01	4.5E-07	2.3E-07	3.3E-11	6.9E-07
Benzo(a)pyrene	1.4	5.5E-07	2.8E-07	4.0E-11	7.3E+00	7.3E+00	7.3E+00	4.0E-06	2.0E-06	2.9E-10	6.0E-06
Benzo(b)fluoranthene	1.5	6.0E-07	3.1E-07	4.4E-11	7.3E-01	7.3E-01	7.6E-01	4.4E-07	2.2E-07	3.3E-11	6.6E-07
Ideno(1,2,3-cd)pyrene	1.2	4.8E-07	2.5E-07	3.5E-11	7.3E-01	7.3E-01	7.3E-01	3.5E-07	1.8E-07	2.6E-11	5.3E-07
POLYCHLORINATED BIPHENYLS											
PCB-1254 (Aroclor 1254)	0.16	6.6E-08	3.6E-08	4.8E-12	2.0E+00	2.0E+00	2.0E+00	1.3E-07	7.2E-08	9.6E-12	2.0E-07
PCB-1260 (Aroclor 1260)	0.52	2.1E-07	1.2E-07	1.5E-11	2.0E+00	2.0E+00	2.0E+00	4.2E-07	2.3E-07	3.1E-11	6.5E-07
PESTICIDES											
beta-BHC	0.010	4.0E-09	6.3E-10	2.9E-13	1.8E+00	1.8E+00	1.9E+00	7.3E-09	1.1E-09	5.6E-13	8.4E-09
gamma-BHC (Lindane)	0.0065	2.6E-09	1.4E-09	1.9E-13	1.3E+00	1.3E+00	1.3E+00	3.4E-09	1.9E-09	2.5E-13	5.3E-09
										ILCR	**9E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-148

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.050	4.9E-10	0.0E+00	1.5E-13	2.9E-03	2.9E-03	2.7E-02	1.4E-12	0.0E+00	4.1E-15	1.4E-12
Ethylbenzene	1.8	1.7E-08	0.0E+00	5.3E-12	7.5E-03	7.5E-03	1.6E-03	1.3E-10	0.0E+00	8.8E-15	1.3E-10
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo(a)anthracene	1.5	1.5E-08	2.6E-08	4.7E-12	7.3E-01	7.3E-01	7.3E-01	1.1E-08	1.9E-08	3.4E-12	3.0E-08
Benzo(a)pyrene	1.4	1.3E-08	2.3E-08	4.1E-12	7.3E+00	7.3E+00	7.3E+00	9.7E-08	1.7E-07	3.0E-11	2.6E-07
Benzo(b)fluoranthene	1.5	1.5E-08	2.5E-08	4.5E-12	7.3E-01	7.3E-01	7.3E-01	1.1E-08	1.8E-08	3.3E-12	2.9E-08
Ideno(1,2,3-cd)pyrene	1.2	1.2E-08	2.0E-08	3.6E-12	7.3E-01	7.3E-01	7.3E-01	8.6E-09	1.5E-08	2.6E-12	2.3E-08
POLYCHLORINATED BIPHENYLS											
PCB-1254 (Aroclor 1254)	0.16	1.6E-09	3.0E-09	4.9E-13	2.0E+00	2.0E+00	2.0E+00	3.2E-09	5.9E-09	9.8E-13	9.1E-09
PCB-1260 (Aroclor 1260)	0.52	5.1E-09	9.4E-09	1.6E-12	2.0E+00	2.0E+00	2.0E+00	1.0E-08	1.9E-08	3.1E-12	2.9E-08
PESTICIDES											
beta-BHC	0.010	9.8E-11	3.9E-11	3.0E-14	1.8E+00	1.8E+00	1.9E+00	1.8E-10	7.0E-11	5.7E-14	2.5E-10
gamma-BHC (Lindane)	0.0065	6.4E-11	2.5E-11	2.0E-14	1.3E+00	1.3E+00	1.3E+00	8.3E-11	3.3E-11	2.5E-14	1.2E-10
										ILCR	**4E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.
na	Not available.

TABLE F-149

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Chromium	28	1.0E-04	0.0E+00	5.0E-09	1.5E+00	1.5E+00	1.5E+00	6.8E-05	0.0E+00	3.4E-09	0.000068
Lead	7.4	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Zinc	26	9.5E-05	0.0E+00	4.7E-09	3.0E-01	3.0E-01	3.0E-01	3.2E-04	0.0E+00	1.6E-08	0.00032
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.050	1.8E-07	0.0E+00	9.0E-12	4.0E-03	4.0E-03	8.6E-03	4.5E-05	0.0E+00	1.1E-09	0.000046
Ethylbenzene	1.8	6.4E-06	0.0E+00	3.2E-10	1.0E-01	1.0E-01	2.9E-01	6.4E-05	0.0E+00	1.1E-09	0.000064
POLYCHLORINATED BIPHENYLS											
PCB 1254 (Aroclor 1254)	0.16	5.8E-07	2.6E-07	2.9E-11	2.0E-05	2.0E-05	2.0E-05	2.9E-02	1.3E-02	1.4E-06	0.042
PCB 1260 (Aroclor 1260)	0.52	1.9E-06	8.4E-07	9.4E-11	2.0E-05	2.0E-05	2.0E-05	9.5E-02	4.2E-02	4.7E-06	0.14
PESTICIDES											
beta-BHC	0.010	3.6E-08	5.8E-09	1.8E-12	1.8E+00	1.8E+00	1.9E+00	2.0E-08	3.2E-09	9.5E-13	0.000000023
gamma-BHC (Lindane)	0.0065	2.4E-08	3.0E-09	1.2E-12	1.0E-01	1.0E-01	2.9E-01	2.4E-07	3.0E-08	4.0E-12	0.00000027
POLYNUCLEAR AROMATIC HYDROCARBONS											
2-Methylnaphthalene	500	1.8E-03	7.5E-04	9.0E-08	2.0E-02	2.0E-02	8.6E-04	9.1E-02	3.7E-02	1.1E-04	0.13
Naphthalene	175	6.4E-04	2.6E-04	3.2E-08	2.0E-02	2.0E-02	8.6E-04	3.2E-02	1.3E-02	3.7E-05	0.045
DIOXINS/FURANS											
Dibenzofuran	4.5	1.6E-05	5.2E-08	8.1E-10	4.0E-03	4.0E-03	4.0E-03	4.1E-03	1.3E-05	2.0E-07	0.0041
										HI	**0.36**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	98,564	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	78,851	2.9E-01	Inc	1.4E-05	1.0E-01	na	2.9E-01	2.9E+00	Inc	4.9E-05	2.9
Diesel Range Organics, Aromatic	39,426	1.4E-01	Inc	7.1E-06	4.0E-02	na	5.7E-01	3.6E+00	Inc	1.2E-05	3.6
Gasoline Range Organics	220	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	154	5.6E-04	Inc	2.8E-08	5.0E+00	na	5.3E+00	1.1E-04	Inc	5.2E-09	0.00011
Gasoline Range Organics, Aromatic	110	4.0E-04	Inc	2.0E-08	2.0E-01	na	1.1E-01	2.0E-03	Inc	1.8E-07	0.0020
Residual Range Organics	3,634	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,271	1.2E-02	Inc	5.9E-07	2.0E+00	na	na	6.0E-03	Inc	Inc	0.0060
Residual Range Organics, Aromatic	1,090	4.0E-03	Inc	2.0E-07	3.0E-02	na	na	1.3E-01	Inc	Inc	0.13
										HI	**6.6**

Notes:

TABLE F-149

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-150

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk: Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Chromium	28	8.0E-07	0.0E+00	2.5E-10	1.5E+00	1.5E+00	1.5E+00	5.3E-07	0.0E+00	1.6E-10	0.00000053
Lead	7.4	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Zinc	26	7.4E-07	0.0E+00	2.3E-10	3.0E-01	3.0E-01	3.0E-01	2.5E-06	0.0E+00	7.6E-10	0.0000025
VOLATILE ORGANIC COMPOUNDS											
Benzene	0.050	1.4E-09	0.0E+00	4.4E-13	4.0E-03	4.0E-03	8.6E-03	3.6E-07	0.0E+00	5.1E-11	0.0000004
Ethylbenzene	1.8	5.1E-08	0.0E+00	1.6E-11	1.0E-01	1.0E-01	2.9E-01	5.1E-07	0.0E+00	5.4E-11	0.0000005
POLYCHLORINATED BIPHENYLS											
PCB 1254 (Aroclor 1254)	0.16	4.6E-09	8.4E-09	1.4E-12	2.0E-05	2.0E-05	2.0E-05	2.3E-04	4.2E-04	7.0E-08	0.00065
PCB 1260 (Aroclor 1260)	0.52	1.5E-08	2.7E-08	4.6E-12	2.0E-05	2.0E-05	2.0E-05	7.4E-04	1.4E-03	2.3E-07	0.0021
PESTICIDES											
beta-BHC	0.010	2.9E-10	1.9E-10	8.8E-14	1.8E+00	1.8E+00	1.9E+00	1.6E-10	1.0E-10	4.6E-14	0.00000000026
gamma-BHC (Lindane)	0.0065	1.9E-10	9.8E-11	5.7E-14	1.3E+00	1.3E+00	1.3E+00	1.4E-10	7.5E-11	4.4E-14	0.00000000022
POLYNUCLEAR AROMATIC HYDROCARBONS											
2-Methylnaphthalene	500	1.4E-05	2.4E-05	4.4E-09	2.0E-02	2.0E-02	8.6E-04	7.1E-04	1.2E-03	5.1E-06	0.0019
Naphthalene	175	5.0E-06	8.6E-06	1.5E-09	2.0E-02	2.0E-02	8.6E-04	2.5E-04	4.3E-04	1.8E-06	0.00068
DIOXINS/FURANS											
Dibenzofuran	4.5	1.3E-07	1.7E-09	4.0E-11	4.0E-03	4.0E-03	4.0E-03	3.2E-05	4.2E-07	9.9E-09	0.000033
										HI	**0.0054**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	98,564	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	78,851	2.3E-03	Inc	6.9E-07	1.0E-01	na	2.9E-01	2.3E-02	Inc	2.4E-06	0.023
Diesel Range Organics, Aromatic	39,426	1.1E-03	Inc	3.5E-07	4.0E-02	na	5.7E-01	2.8E-02	Inc	6.1E-07	0.028
Gasoline Range Organics	220	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	154	4.4E-06	Inc	1.4E-09	5.0E+00	na	5.3E+00	8.8E-07	Inc	2.6E-10	0.00000088
Gasoline Range Organics, Aromatic	110	3.1E-06	Inc	9.7E-10	2.0E-01	na	1.1E-01	1.6E-05	Inc	8.8E-09	0.000016
Residual Range Organics	3,634	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]	na[f]
Residual Range Organics, Aliphatic	3,271	9.3E-05	Inc	2.9E-08	2.0E+00	na	na	4.7E-05	Inc	Inc	0.000047
Residual Range Organics, Aromatic	1,090	3.1E-05	Inc	9.6E-09	3.0E-02	na	na	1.0E-03	Inc	Inc	0.0010
										HI	**0.052**

Notes:

TABLE F-150

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-151

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.00081	3.1E-06	1.8E-05	Inc	2.0E+00	2.0E+00	2.0E+00	6.2E-06	3.6E-05	Inc	4.2E-05
										ILCR	**4E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-152

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.00081	3.2E-07	1.4E-06	Inc	2.0E+00	2.0E+00	2.0E+00	6.3E-07	2.7E-06	Inc	3.3E-06
										ILCR	**3E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile Organic Compounds

TABLE F-153

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Chromium	0.015	1.3E-04	1.2E-05	Inc	1.5E+00	1.5E+00	1.5E+00	8.5E-05	8.0E-06	Inc	0.000093
Copper	0.040	3.4E-04	1.6E-05	Inc	3.7E-02	3.7E-02	3.7E-02	9.1E-03	4.3E-04	Inc	0.0096
Lead	0.086	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.011	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Zinc	0.62	5.2E-03	2.5E-04	Inc	3.0E-01	3.0E-01	3.0E-01	1.7E-02	8.2E-04	Inc	0.018
Zinc, Dissolved	0.23	1.9E-03	9.0E-05	Inc	3.0E-01	3.0E-01	3.0E-01	6.3E-03	3.0E-04	Inc	0.0066
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.00081	6.8E-06	1.4E-04	Inc	2.0E-05	2.0E-05	2.0E-05	3.4E-01	6.9E+00	Inc	7.3
										HI	**7.3**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	46	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	37	3.1E-01	Inc	2.1E-01	1.0E-01	na	2.9E-01	3.1E+00	Inc	7.2E-01	3.9
Diesel Range Organics, Aromatic	19	1.6E-01	Inc	1.0E-01	4.0E-02	na	5.7E-01	3.9E+00	Inc	1.8E-01	4.1
Gasoline Range Organics	0.57	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.40	3.3E-03	Inc	4.4E-02	5.0E+00	na	5.3E+00	6.7E-04	Inc	8.3E-03	0.0090
Gasoline Range Organics, Aromatic	0.28	2.4E-03	Inc	3.2E-02	2.0E-01	na	1.1E-01	1.2E-02	Inc	2.9E-01	0.30
										HI	**8.3**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-153

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-154

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Chromium, Dissolved	0.015	1.7E-05	3.4E-07	Inc	1.5E+00	1.5E+00	1.5E+00	1.1E-05	2.3E-07	Inc	0.000012
Copper	0.040	4.6E-05	4.6E-07	Inc	3.7E-02	3.7E-02	3.7E-02	1.2E-03	1.2E-05	Inc	0.0012
Lead, Dissolved	0.086	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Lead, Dissolved	0.011	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Zinc	0.62	7.0E-04	7.0E-06	Inc	3.0E-01	3.0E-01	3.0E-01	2.3E-03	2.3E-05	Inc	0.0024
Zinc, Dissolved	0.23	2.6E-04	2.6E-06	Inc	3.0E-01	3.0E-01	3.0E-01	8.6E-04	8.6E-06	Inc	0.00086
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	0.00081	9.2E-07	4.0E-06	Inc	2.0E-05	2.0E-05	2.0E-05	4.6E-02	2.0E-01	Inc	0.24
										HI	**0.25**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	46	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	37	4.2E-02	Inc	1.0E-02	1.0E-01	na	2.9E-01	4.2E-01	Inc	3.5E-02	0.46
Diesel Range Organics, Aromatic	19	2.1E-02	Inc	5.1E-03	4.0E-02	na	5.7E-01	5.3E-01	Inc	8.9E-03	0.54
Gasoline Range Organics	0.57	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.3955	4.5E-04	Inc	2.1E-03	5.0E+00	na	5.3E+00	9.0E-05	Inc	4.0E-04	0.00049
Gasoline Range Organics, Aromatic	0.2825	3.2E-04	Inc	1.5E-03	2.0E-01	na	1.1E-01	1.6E-03	Inc	1.4E-02	0.016
										HI	**1.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-154

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-155

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Groundwater Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.039	1.5E-04	2.0E-06	Inc	1.5E+00	1.5E+00	1.5E+01	2.2E-04	3.1E-06	Inc	2.3E-04
										ILCR	**2E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-156

CANCER RISK CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.039	1.5E-05	1.5E-07	Inc	1.5E+00	1.5E+00	1.5E+01	2.3E-05	2.3E-07	Inc	2.3E-05
										ILCR	**2E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kg-d	Milligrams per kilogram per day.
VOC	Volatile organic compound.

TABLE F-157

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 28 - Drainage Basin - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Ingestion	Dermal	VOC Inhalation	Chemical-Specific HQ
INORGANICS											
Arsenic	0.039	3.3E-04	1.6E-05	Inc	3.0E-04	3.0E-04	3.0E-04	1.1E+00	5.2E-02	Inc	1.2
Copper	0.18	1.5E-03	7.2E-05	Inc	3.7E-02	3.7E-02	3.7E-02	4.1E-02	1.9E-03	Inc	0.043
Lead	0.20	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.16	1.4E-03	1.3E-05	Inc	2.0E-02	2.0E-02	2.0E-02	6.8E-02	6.4E-04	Inc	0.068
										HI	**1.3**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3.2	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	2.6	2.2E-02	Inc	1.4E-02	1.0E-01	na	2.9E-01	2.2E-01	Inc	5.0E-02	0.27
Diesel Range Organics, Aromatic	1.3	1.1E-02	Inc	7.2E-03	4.0E-02	na	5.7E-01	2.7E-01	Inc	1.3E-02	0.28
										HI	**0.55**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-158

NONCANCER HAZARD CALCULATIONS FOR A FUTURE INCIDENTAL VISITOR
SITE 28 - Drainage Basin - SHALLOW SUBSURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Arsenic	0.039	4.5E-05	4.5E-07	Inc	3.0E-04	3.0E-04	3.0E-04	1.5E-01	1.5E-03	Inc	0.15
Copper	0.18	2.1E-04	2.1E-06	Inc	3.7E-02	3.7E-02	3.7E-02	5.6E-03	5.6E-05	Inc	0.0056
Lead	0.20	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Nickel	0.16	1.8E-04	3.7E-07	Inc	2.0E-02	2.0E-02	2.0E-02	9.1E-03	1.8E-05	Inc	0.0092
										HI	**0.16**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	3.2	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	2.6	2.9E-03	Inc	7.0E-04	1.0E-01	na	2.9E-01	2.9E-02	Inc	2.4E-03	0.032
Diesel Range Organics, Aromatic	1.3	1.5E-03	Inc	3.5E-04	4.0E-02	na	5.7E-01	3.7E-02	Inc	6.2E-04	0.037
										HI	**0.069**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

Table F-159

CANCER RISK CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 28 - Drainage Basin - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Plant Ingestion	Chemical-Specific Risk
INORGANICS					
Arsenic	0.55	1.7E-04	1.5E+00	2.6E-04	2.6E-04
Cadmium	1.1	3.4E-04	na	na	0.0E+00
POLYNUCLEAR AROMATIC HYDROCARBONS					
Benzo(a)anthracene	0.088	2.7E-05	7.3E-01	2.0E-05	2.0E-05
Benzo(a)pyrene	0.13	3.9E-05	7.3E+00	2.9E-04	2.9E-04
Benzo(b)fluoranthene	0.15	4.8E-05	7.3E-01	3.5E-05	3.5E-05
Benzo(k)fluoranthene	0.12	3.9E-05	7.3E-02	2.8E-06	2.8E-06
Chrysene	0.16	4.9E-05	7.3E-03	3.6E-07	3.6E-07
Dibenzo(a,h)anthracene	0.027	8.3E-06	7.3E+00	6.1E-05	6.1E-05
Indeno(1,2,3-cd)pyrene	0.19	5.8E-05	7.3E-01	4.3E-05	4.3E-05
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.18	5.6E-05	2.0E+00	1.1E-04	1.1E-04
PCB-1260 (Aroclor 1260)	0.099	3.1E-05	2.0E+00	6.2E-05	6.2E-05
				ILCR	**9E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
Only plant samples obtained from harvested species are included in the concentration derivation.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

TABLE F-160

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 28 - Drainage Basin - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Plant Ingestion	Chemical-Specific HQ
INORGANICS					
Antimony	0.0030	5.8E-06	4.0E-04	1.4E-02	0.014
Arsenic	0.55	1.0E-03	3.0E-04	3.5E+00	3.5
Barium	36	7.0E-02	7.0E-02	1.0E+00	1.0
Cadmium	1.1	2.2E-03	5.0E-04	4.3E+00	4.3
Chromium	9.6	1.8E-02	1.5E+00	1.2E-02	0.012
Copper	3.2	6.1E-03	3.7E-02	1.7E-01	0.17
Lead	5.0	na[b]	na[b]	na[b]	na[b]
Mercury	0.027	5.2E-05	3.0E-04	1.7E-01	0.17
Nickel	3.7	7.2E-03	2.0E-02	3.6E-01	0.36
Selenium	0.050	9.6E-05	5.0E-03	1.9E-02	0.019
Silver	0.023	4.4E-05	5.0E-03	8.8E-03	0.0088
Vanadium	3.1	6.0E-03	7.0E-03	8.6E-01	0.86
Zinc	61	1.2E-01	3.0E-01	3.9E-01	0.39
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Methylnaphthalene	0.013	2.5E-05	2.0E-02	1.2E-03	0.0012
Acenaphthene	0.052	1.0E-04	6.0E-02	1.7E-03	0.0017
Anthracene	0.013	2.6E-05	3.0E-01	8.5E-05	0.000085
Benzo(g,h,i)perylene	0.075	1.4E-04	2.0E-02	7.2E-03	0.0072
Fluoranthene	0.44	8.5E-04	4.0E-02	2.1E-02	0.021
Fluorene	0.034	6.6E-05	4.0E-02	1.6E-03	0.0016
Naphthalene	0.017	3.2E-05	2.0E-02	1.6E-03	0.0016
Phenanthrene	0.42	8.0E-04	3.0E-01	2.7E-03	0.0027
Pyrene	0.36	6.9E-04	3.0E-02	2.3E-02	0.023
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.18	3.4E-04	2.0E-05	1.7E+01	17

TABLE F-160

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 28 - Drainage Basin - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Plant Ingestion	Chemical-Specific HQ
PCB-1260 (Aroclor 1260)	0.099	1.9E-04	2.0E-05	9.4E+00	9.4
				HI	**38**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Only plant samples obtained from harvested species are included in the concentration derivation.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-161

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Arsenic	5.7	2.3E-06	2.7E-07	1.7E-10	1.5E+00	1.5E+00	1.5E+01	3.4E-06	4.1E-07	2.5E-09	3.9E-06
										ILCR	**4E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-162

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	
INORGANICS											
Arsenic	5.7	5.6E-08	2.2E-08	1.7E-11	1.5E+00	1.5E+00	1.5E+01	8.4E-08	3.3E-08	2.6E-10	1.2E-07
										ILCR	**1E-07**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-163

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Aluminum	15,900	5.8E-02	0.0E+00	2.9E-06	1.0E+00	1.0E+00	1.4E-03	5.8E-02	0.0E+00	2.1E-03	0.060
Arsenic	5.7	2.1E-05	2.0E-06	1.0E-09	3.0E-04	3.0E-04	3.0E-04	6.9E-02	6.6E-03	3.4E-06	0.076
Barium	115	4.2E-04	0.0E+00	2.1E-08	7.0E-02	7.0E-02	1.4E-04	6.0E-03	0.0E+00	1.5E-04	0.0061
Cobalt	7.0	2.5E-05	0.0E+00	1.3E-09	2.0E-02	2.0E-02	5.7E-06	1.3E-03	0.0E+00	2.2E-04	0.0015
Lead	114	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]	na[b]
Manganese	0.05	1.8E-07	0.0E+00	9.0E-12	1.4E-01	1.4E-01	1.4E-05	1.3E-06	0.0E+00	6.5E-07	0.0000019
Vanadium	35	1.3E-04	0.0E+00	6.3E-09	7.0E-03	7.0E-03	7.0E-03	1.8E-02	0.0E+00	9.0E-07	0.018
VOCs											
m,p-Xylene	0.0032	1.2E-08	0.0E+00	5.8E-13	2.0E-01	2.0E-01	2.9E-02	5.8E-08	0.0E+00	2.0E-11	0.000000058
DIOXINS/FURANS											
Dibenzofuran	0.0086	3.1E-08	9.9E-11	1.6E-12	4.0E-03	4.0E-03	4.0E-03	7.8E-06	2.5E-08	3.9E-10	0.0000079
										HI	**0.16**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1,859	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	1,488	5.4E-03	Inc	2.7E-07	1.0E-01	na	2.9E-01	5.4E-02	Inc	9.3E-07	0.054
Diesel Range Organics, Aromatic	744	2.7E-03	Inc	1.3E-07	4.0E-02	na	5.7E-01	6.8E-02	Inc	2.4E-07	0.068
										HI	**0.12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-163

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-164

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Sediment Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
INORGANICS											
Aluminum	15,900	4.5E-04	0.0E+00	1.4E-07	1.0E+00	1.0E+00	1.4E-03	4.5E-04	0.0E+00	1.0E-04	0.00055
Arsenic	5.7	1.6E-07	6.4E-08	5.0E-11	3.0E-04	3.0E-04	3.0E-04	5.4E-04	2.1E-04	1.7E-07	0.00076
Barium	115	3.3E-06	0.0E+00	1.0E-09	7.0E-02	7.0E-02	1.4E-04	4.7E-05	0.0E+00	7.2E-06	0.000054
Cobalt	7.0	2.0E-07	0.0E+00	6.1E-11	6.0E-02	6.0E-02	6.0E-02	3.3E-06	0.0E+00	1.0E-09	0.0000033
Manganese	114	3.3E-06	0.0E+00	1.0E-09	1.4E-01	1.4E-01	1.4E-05	2.3E-05	0.0E+00	7.2E-05	0.000095
Mercury	0.05	1.4E-09	0.0E+00	4.4E-13	3.0E-04	3.0E-04	3.0E-04	4.8E-06	0.0E+00	1.5E-09	0.0000048
Vanadium	35	1.0E-06	0.0E+00	3.1E-10	7.0E-03	7.0E-03	7.0E-03	1.4E-04	0.0E+00	4.4E-08	0.00014
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.0032	9.1E-11	0.0E+00	2.8E-14	7.0E-01	7.0E-01	2.9E-02	1.3E-10	0.0E+00	9.7E-13	0.00000000013
DIOXINS/FURANS											
Dibenzofuran	0.0086	2.5E-10	3.2E-12	7.6E-14	4.0E-03	4.0E-03	4.0E-03	6.1E-08	8.1E-10	1.9E-11	0.000000062
										HI	**0.0016**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1,859	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	1,488	4.2E-05	Inc	1.3E-08	1.0E-01	na	2.9E-01	4.2E-04	Inc	4.5E-08	0.00042
Diesel Range Organics, Aromatic	744	2.1E-05	Inc	6.5E-09	4.0E-02	na	5.7E-01	5.3E-04	Inc	1.1E-08	0.00053
										HI	**0.0010**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-164

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 29 - Suqitughneg River - SEDIMENT
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Sediment Concentration[a] (mg/kg)	Sediment Ingestion Dose (mg/kg-d)	Sediment Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Sediment Ingestion	Dermal	Dust Inhalation	

of a medium

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-165

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 29 - Suqitughneg River - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	0.040	3.4E-04	1.6E-05	Inc	1.0E+00	1.0E+00	1.4E-03	3.4E-04	1.6E-05	Inc	0.00035
Barium	0.0050	4.2E-05	2.0E-06	Inc	7.0E-02	7.0E-02	1.4E-05	6.0E-04	2.9E-05	Inc	0.00063
Manganese	0.027	2.3E-04	1.1E-05	Inc	1.4E-01	1.4E-01	1.4E-05	1.6E-03	7.7E-05	Inc	0.0017
Silver, Dissolved	0.020	1.7E-04	8.0E-06	Inc	5.0E-03	5.0E-03	5.0E-03	3.4E-02	1.6E-03	Inc	0.035
Zinc	0.0080	6.8E-05	3.2E-06	Inc	3.0E-01	3.0E-01	3.0E-01	2.3E-04	1.1E-05	Inc	0.00024
										HI	**0.038**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	0.16	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.13	1.1E-03	Inc	7.2E-04	1.0E-01	na	2.9E-01	1.1E-02	Inc	2.5E-03	0.013
Diesel Range Organics, Aromatic	0.064	5.4E-04	Inc	3.6E-04	4.0E-02	na	5.7E-01	1.4E-02	Inc	6.3E-04	0.014
Gasoline Range Organics	0.29	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.21	1.7E-03	Inc	2.3E-02	5.0E+00	na	5.3E+00	3.5E-04	Inc	4.3E-03	0.0047
Gasoline Range Organics, Aromatic	0.15	1.2E-03	Inc	1.6E-02	2.0E-01	na	1.1E-01	6.2E-03	Inc	1.5E-01	0.16
										HI	**0.19**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-165

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 29 - Suqitughneg River - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-166

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 29 - Suqitughneg River - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	
INORGANICS											
Aluminum	0.040	4.6E-05	4.6E-07	Inc	1.0E+00	1.0E+00	1.4E-03	4.6E-05	4.6E-07	Inc	0.000046
Barium	0.0050	5.7E-06	5.7E-08	Inc	7.0E-02	7.0E-02	1.4E-04	8.2E-05	8.2E-07	Inc	0.000082
Manganese	0.027	3.1E-05	3.1E-07	Inc	1.4E-01	1.4E-01	1.4E-05	2.2E-04	2.2E-06	Inc	0.00022
Silver, Dissolved	0.020	2.3E-05	1.4E-07	Inc	5.0E-03	5.0E-03	5.0E-03	4.6E-03	2.7E-05	Inc	0.0046
Zinc	0.0080	9.1E-06	9.1E-08	Inc	3.0E-01	3.0E-01	3.0E-01	3.0E-05	3.0E-07	Inc	0.000031
										HI	**0.0050**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	0.16	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	0.13	1.5E-04	Inc	3.5E-05	1.0E-01	na	2.9E-01	1.5E-03	Inc	1.2E-04	0.0016
Diesel Range Organics, Aromatic	0.064	7.3E-05	Inc	1.8E-05	4.0E-02	na	5.7E-01	1.8E-03	Inc	3.1E-05	0.0019
Gasoline Range Organics	0.29	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Gasoline Range Organics, Aliphatic	0.21	2.4E-04	Inc	1.1E-03	5.0E+00	na	5.3E+00	4.7E-05	Inc	2.1E-04	0.00026
Gasoline Range Organics, Aromatic	0.15	1.7E-04	Inc	8.0E-04	2.0E-01	na	1.1E-01	8.4E-04	Inc	7.3E-03	0.0081
										HI	**0.012**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as GRO (method 8015) by segregating total GRO concentrations into aliphatic and aromatic fractions, assuming 70% aliphatic hydrocarbons and 50% aromatic hydrocarbons (ADEC, 2000c).

[f] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method)

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/L	Milligrams per liter.
mg/kd-d	Milligrams per kilogram per day.
na	not available
VOC	Volatile organic compound.

TABLE F-166

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 29 - Suqitughneg River - FRESH SURFACE WATER
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Surface Water Concentration[a] (mg/L)	Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	VOC Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Ingestion	Dermal	VOC Inhalation	

by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-167

CANCER RISK CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 29 - Suqitughneg River - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Fish Ingestion	Chemical-Specific Risk
INORGANICS					
Arsenic	0.71	5.6E-04	1.5E+00	8.3E-04	8.3E-04
Cadmium	0.0075	5.9E-06	na	na	0.0E+00
POLYNUCLEAR AROMATIC HYDROCARBONS					
Benzo(a)anthracene	0.0047	3.7E-06	7.3E-01	2.7E-06	2.7E-06
Benzo(a)pyrene	0.0037	2.9E-06	7.3E+00	2.1E-05	2.1E-05
Benzo(b)fluoranthene	0.0030	2.4E-06	7.3E-01	1.7E-06	1.7E-06
Benzo(k)fluoranthene	0.0064	5.0E-06	7.3E-02	3.6E-07	3.6E-07
Chrysene	0.0084	6.6E-06	7.3E-03	4.8E-08	4.8E-08
Dibenzo(a,h)anthracene	0.0041	3.2E-06	7.3E+00	2.3E-05	2.3E-05
Indeno(1,2,3-cd)pyrene	0.0026	2.0E-06	7.3E-01	1.5E-06	1.5E-06
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.014	1.1E-05	2.0E+00	2.2E-05	2.2E-05
PCB-1260 (Aroclor 1260)	0.0045	3.5E-06	2.0E+00	7.0E-06	7.0E-06
				ILCR	**9E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

Fish samples obtained from ambient locations. Concentration based only on fillet samples.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

TABLE F-167

CANCER RISK CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 29 - Suqitughneg River - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Fish Ingestion	Chemical-Specific Risk

ILCR - incremental lifetime cancer risk.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

TABLE F-168

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 29 - Suqitughneg River - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Fish Ingestion	Chemical-Specific HQ
INORGANICS					
Arsenic	0.71	3.6E-03	3.0E-04	1.2E+01	12
Barium	0.043	2.2E-04	7.0E-02	3.1E-03	0.0031
Cadmium	0.0075	3.8E-05	1.5E+00	2.5E-05	0.000025
Copper	0.79	4.0E-03	3.7E-02	1.1E-01	0.11
Lead	0.0080	4.0E-05	na[b]	na[b]	na[b]
Mercury	0.020	1.0E-04	3.0E-04	3.3E-01	0.33
Nickel	0.054	2.7E-04	2.0E-02	1.4E-02	0.014
Selenium	0.15	7.5E-04	5.0E-03	1.5E-01	0.15
Vanadium	0.051	2.6E-04	7.0E-03	3.7E-02	0.037
Zinc	6.9	3.4E-02	3.0E-01	1.1E-01	0.11
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Methylnaphthalene	0.0065	3.3E-05	2.0E-02	1.6E-03	0.0016
Acenaphthene	0.0042	2.1E-05	6.0E-02	3.5E-04	0.00035
Anthracene	0.0042	2.1E-05	3.0E-01	7.0E-05	0.000070
Benzo(g,h,i)perylene	0.0043	2.2E-05	2.0E-02	1.1E-03	0.0011
Fluoranthene	0.0050	2.5E-05	4.0E-02	6.3E-04	0.00063
Fluorene	0.0046	2.3E-05	4.0E-02	5.8E-04	0.00058
Naphthalene	0.0033	1.7E-05	2.0E-02	8.3E-04	0.00083
Phenanthrene	0.0048	2.4E-05	3.0E-01	8.1E-05	0.000081
Pyrene	0.0054	2.7E-05	3.0E-02	9.0E-04	0.00090
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.014	7.0E-05	2.0E-05	3.5E+00	3.5
PCB-1260 (Aroclor 1260)	0.0045	2.3E-05	2.0E-05	1.1E+00	1.1

TABLE F-168

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 29 - Suqitughneg River - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Fish Ingestion	Chemical-Specific HQ
				HI	17

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

Fish samples obtained from Site 29 - Suqitughneq River. Concentration based only on fillet samples.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

HI - Hazard index.
HQ - Hazard quotient.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

TABLE F-169

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 30 - Ambient - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Fish Ingestion	Chemical-Specific Risk
INORGANICS					
Arsenic	0.88	6.9E-04	1.5E+00	1.0E-03	1.0E-03
Cadmium	0.0080	6.3E-06	na	na	0.0E+00
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.011	8.6E-06	2.0E+00	1.7E-05	1.7E-05
				ILCR	**1E-03**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

Fish samples obtained from ambient locations. Concentration based only on fillet samples.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR - incremental lifetime cancer risk.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

TABLE F-170

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Fish Ingestion	Chemical-Specific HQ
INORGANICS					
Arsenic	0.88	4.4E-03	3.0E-04	1.5E+01	15
Barium	0.059	3.0E-04	7.0E-02	4.2E-03	0.004
Cadmium	0.0080	4.0E-05	5.0E-04	8.0E-02	0.08
Copper	1.1	5.5E-03	3.7E-02	1.5E-01	0.15
Lead	0.0040	2.0E-05	na[b]	na[b]	0
Mercury	0.034	1.7E-04	3.0E-04	5.7E-01	0.57
Nickel	0.050	2.5E-04	2.0E-02	1.3E-02	0.01
Selenium	0.18	9.0E-04	5.0E-03	1.8E-01	0.18
Vanadium	0.075	3.8E-04	7.0E-03	5.4E-02	0.054
Zinc	14	7.0E-02	3.0E-01	2.3E-01	0.23
POLYNUCLEAR AROMATIC HYDROCARBONS					
Fluoranthene	0.0015	7.5E-06	4.0E-02	1.9E-04	0.00019
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.011	5.5E-05	2.0E-05	2.8E+00	2.8
				HI	**19**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Fish samples obtained from Site 29 - Suqitughneq River. Concentration based only on fillet samples.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

HI - Hazard index.

TABLE F-170

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - FISH CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Fish Concentration[a] (mg/kg)	Fish Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Fish Ingestion	Chemical-Specific HQ

HQ - Hazard quotient.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

Table F-171

CANCER RISK CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Plant Ingestion	Chemical-Specific Risk
INORGANICS					
Arsenic	0.56	1.7E-04	1.5E+00	2.6E-04	2.6E-04
Cadmium	0.88	2.7E-04	na	na	0.0E+00
POLYNUCLEAR AROMATIC HYDROCARBONS					
Benzo(a)anthracene	0.075	2.3E-05	7.3E-01	1.7E-05	1.7E-05
Benzo(a)pyrene	0.021	6.6E-06	7.3E+00	4.8E-05	4.8E-05
Benzo(b)fluoranthene	0.053	1.7E-05	7.3E-01	1.2E-05	1.2E-05
Benzo(k)fluoranthene	0.046	1.4E-05	7.3E-02	1.0E-06	1.0E-06
Chrysene	0.087	2.7E-05	7.3E-03	2.0E-07	2.0E-07
Dibenzo(a,h)anthracene	0.013	4.1E-06	7.3E+00	3.0E-05	3.0E-05
Indeno(1,2,3-cd)pyrene	0.024	7.5E-06	7.3E-01	5.5E-06	5.5E-06
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.011	3.4E-06	2.0E+00	6.9E-06	6.9E-06
PCB-1260 (Aroclor 1260)	0.0095	3.0E-06	2.0E+00	5.9E-06	5.9E-06
				ILCR	**4E-04**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.
Only plant samples obtained from harvested species are included in the concentration derivation.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

Table F-171

CANCER RISK CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Cancer Slope Factor Oral $(mg/kg\text{-}d)^{-1}$	Pathway-Specific Cancer Risk Plant Ingestion	Chemical-Specific Risk

ILCR - incremental lifetime cancer risk.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

TABLE F-172

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Plant Ingestion	Chemical-Specific HQ
INORGANICS					
Arsenic	0.56	1.1E-03	3.0E-04	3.6E+00	3.6
Barium	21	4.1E-02	7.0E-02	5.8E-01	0.58
Cadmium	0.88	1.7E-03	5.0E-04	3.4E+00	3.4
Chromium	9.0	1.7E-02	1.0E+00	1.7E-02	0.017
Copper	2.8	5.4E-03	3.7E-02	1.5E-01	0.15
Lead	3.5	na[b]	na[b]	na[b]	na[b]
Mercury	0.021	4.0E-05	3.0E-04	1.3E-01	0.13
Nickel	4.2	8.1E-03	2.0E-02	4.0E-01	0.40
Selenium	0.05	9.6E-05	5.0E-03	1.9E-02	0.019
Silver	0.019	3.6E-05	5.0E-03	7.3E-03	0.007
Vanadium	3.6	7.0E-03	7.0E-03	1.0E+00	1.0
Zinc	57	1.1E-01	3.0E-01	3.6E-01	0.36
POLYNUCLEAR AROMATIC HYDROCARBONS					
2-Methylnaphthalene	0.0076	1.5E-05	2.0E-02	7.3E-04	0.00073
Acenaphthene	0.013	2.5E-05	6.0E-02	4.2E-04	0.00042
Anthracene	0.049	9.4E-05	3.0E-01	3.1E-04	0.00031
Benzo(g,h,i)perylene	0.013	2.5E-05	2.0E-02	1.2E-03	0.0012
Fluoranthene	0.38	7.3E-04	4.0E-02	1.8E-02	0.018
Fluorene	0.022	4.2E-05	4.0E-02	1.1E-03	0.0011
Naphthalene	0.0078	1.5E-05	2.0E-02	7.5E-04	0.00075
Phenanthrene	0.29	5.6E-04	3.0E-01	1.9E-03	0.0019
Pyrene	0.28	5.4E-04	3.0E-02	1.8E-02	0.018
POLYCHLORINATED BIPHENYLS					
PCB-1254 (Aroclor 1254)	0.011	2.1E-05	2.0E-05	1.1E+00	1.1
PCB-1260 (Aroclor 1260)	0.0095	1.8E-05	2.0E-05	0.910958904	0.91
				HI	**12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

TABLE F-172

NONCANCER HAZARD CALCULATIONS FOR SUBSISTENCE FOOD USE
SITE 30 - Ambient - PLANT CONSUMPTION
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Plant Concentration[a] (mg/kg)	Plant Ingestion Dose (mg/kg-d)	Reference Dose Oral (mg/kg-d)	Pathway-Specific Hazard Plant Ingestion	Chemical-Specific HQ

[a] Only plant samples obtained from harvested species are included in the concentration derivation.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI - Hazard index.
HQ - Hazard quotient.
mg/kg - Milligrams per kilogram.
mg/kg-d - Milligrams per kilogram per day.

TABLE F-173

CANCER RISK CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 31- White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$ Oral	Dermal	Inhalation	Pathway-Specific Cancer Risk Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific Risk
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	8.9E-06	4.9E-06	6.5E-10	2.0E+00	2.0E+00	2.0E+00	1.8E-05	9.8E-06	1.3E-09	2.7E-05
										ILCR	**3E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site. Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
3) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
   Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-174

CANCER RISK CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	2.7E-05	1.5E-05	1.9E-09	2.0E+00	2.0E+00	2.0E+00	5.3E-05	2.9E-05	3.9E-09	8.2E-05
										ILCR	**8E-05**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected in soil tundra and soil gravel at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-175

CANCER RISK CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Soil Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Cancer Slope Factor (mg/kg-d)$^{-1}$			Pathway-Specific Cancer Risk			Chemical-Specific Risk
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	2.2E-07	4.0E-07	6.6E-11	2.0E+00	2.0E+00	2.0E+00	4.3E-07	8.0E-07	1.3E-10	1.2E-06
										ILCR	**1E-06**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

1) Doses and cancer risks shown only for carcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Cancer risks are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Cancer Risk = Exposure Dose x Cancer Slope Factor.

ILCR	Incremental lifetime cancer risk.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kg-d	Milligrams per kilogram per day.

TABLE F-176

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 31 - White Alive Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.017	6.2E-08	0.0E+00	3.1E-12	2.0E-01	2.0E-01	2.9E-02	3.1E-07	0.0E+00	1.1E-10	0.00000031
o-Xylene	0.0053	1.9E-08	0.0E+00	9.6E-13	2.0E-01	2.0E-01	2.9E-02	1.9E-08	1.9E-08	1.9E-08	0.000000019
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	8.0E-05	3.6E-05	4.0E-09	2.0E-05	2.0E-05	2.0E-05	4.0E+00	1.8E+00	2.0E-04	5.8
										HI	**5.8**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	8,307	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6,646	2.4E-02	Inc	1.2E-06	1.0E-01	na	2.9E-01	2.4E-01	Inc	4.1E-06	0.24
Diesel Range Organics, Aromatic	3,323	1.2E-02	Inc	6.0E-07	4.0E-02	na	5.7E-01	3.0E-01	Inc	1.1E-06	0.30
Residual Range Organics	2,165	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,948	7.1E-03	Inc	3.5E-07	2.0E+00	na	na	3.5E-03	Inc	Inc	0.0035
Residual Range Organics, Aromatic	649	2.4E-03	Inc	1.2E-07	3.0E-02	na	na	7.9E-02	Inc	Inc	0.079
										HI	**0.63**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-176

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 31 - White Alive Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

of a medium.

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-177

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.017	1.9E-07	0.0E+00	9.2E-12	2.0E-01	2.0E-01	2.9E-02	9.3E-07	0.0E+00	3.2E-10	0.00000093
o-Xylene	0.0053	5.8E-08	0.0E+00	2.9E-12	2.0E-01	2.0E-01	2.9E-02	2.9E-07	0.0E+00	9.9E-11	0.00000029
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	2.4E-04	1.1E-04	1.2E-08	2.0E-05	2.0E-05	2.0E-05	1.2E+01	5.3E+00	6.0E-04	17
										HI	**17**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	8,307	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6,646	7.3E-02	Inc	3.6E-06	1.0E-01	na	2.9E-01	7.3E-01	Inc	1.2E-05	0.7
Diesel Range Organics, Aromatic	3,323	3.6E-02	Inc	1.8E-06	4.0E-02	na	5.7E-01	9.1E-01	Inc	3.2E-06	0.9
Residual Range Organics	2,165	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,948	2.1E-02	Inc	1.1E-06	2.0E+00	na	na	1.1E-02	Inc	Inc	0.011
Residual Range Organics, Aromatic	649	7.1E-03	Inc	3.5E-07	3.0E-02	na	na	2.4E-01	Inc	Inc	0.24
										HI	**1.9**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-177

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-178

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
VOLATILE ORGANIC COMPOUNDS											
m,p-Xylene	0.017	4.9E-10	0.0E+00	1.5E-13	2.0E-01	2.0E-01	2.9E-02	2.4E-09	0.0E+00	5.1E-12	0.0000000024
o-Xylene	0.0053	1.5E-10	0.0E+00	4.7E-14	2.0E-01	2.0E-01	2.9E-02	7.6E-10	0.0E+00	1.6E-12	0.00000000076
POLYCHLORINATED BIPHENYLS											
PCB-1260 (Aroclor 1260)	22	6.3E-07	1.2E-06	1.9E-10	2.0E-05	2.0E-05	2.0E-05	3.1E-02	5.8E-02	9.7E-06	0.089
										HI	**0.089**
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	8,307	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	6,646	1.9E-04	Inc	5.8E-08	1.0E-01	na	2.9E-01	1.9E-03	Inc	2.0E-07	0.0019
Diesel Range Organics, Aromatic	3,323	9.5E-05	Inc	2.9E-08	4.0E-02	na	5.7E-01	2.4E-03	Inc	5.1E-08	0.0024
Residual Range Organics	2,165	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,948	5.6E-05	Inc	1.7E-08	2.0E+00	na	na	2.8E-05	Inc	Inc	0.000028
Residual Range Organics, Aromatic	649	1.9E-05	Inc	5.7E-09	3.0E-02	na	na	6.2E-04	Inc	Inc	0.00062
										HI	**0.0049**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-178

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 31 - White Alice Communications Site - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d)			Pathway-Specific Hazard			Chemical-Specific HQ
					Oral	Dermal	Inhalation	Soil Ingestion	Dermal	Dust Inhalation	

3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

TABLE F-179

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 32 - Lower Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,400	3.8E-02	Inc	1.9E-06	1.0E-01	na	2.9E-01	3.8E-01	Inc	6.5E-06	0.38
Diesel Range Organics, Aromatic	5,200	1.9E-02	Inc	9.4E-07	4.0E-02	na	5.7E-01	4.7E-01	Inc	1.6E-06	0.47
Residual Range Organics	3,600	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,240	1.2E-02	Inc	5.9E-07	2.0E+00	na	na	5.9E-03	Inc	Inc	0.0059
Residual Range Organics, Aromatic	1,080	3.9E-03	Inc	2.0E-07	3.0E-02	na	na	1.3E-01	Inc	Inc	0.13
										HI	**0.99**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-180

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 32 - Lower Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,400	1.1E-01	Inc	5.6E-06	1.0E-01	na	2.9E-01	1.1E+00	Inc	1.9E-05	1.1
Diesel Range Organics, Aromatic	5,200	5.7E-02	Inc	2.8E-06	4.0E-02	na	5.7E-01	1.4E+00	Inc	4.9E-06	1.4
Residual Range Organics	3,600	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,240	3.5E-02	Inc	1.8E-06	2.0E+00	na	na	1.8E-02	Inc	Inc	0.018
Residual Range Organics, Aromatic	1,080	1.2E-02	Inc	5.9E-07	3.0E-02	na	na	3.9E-01	Inc	Inc	0.39
										HI	**3.0**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-181

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 32 - Lower Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	13,000	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	10,400	3.0E-04	Inc	9.1E-08	1.0E-01	na	2.9E-01	3.0E-03	Inc	3.1E-07	0.0030
Diesel Range Organics, Aromatic	5,200	1.5E-04	Inc	4.6E-08	4.0E-02	na	5.7E-01	3.7E-03	Inc	8.0E-08	0.0037
Residual Range Organics	3,600	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	3,240	9.2E-05	Inc	2.8E-08	2.0E+00	na	na	4.6E-05	Inc	Inc	4.6E-05
Residual Range Organics, Aromatic	1,080	3.1E-05	Inc	9.5E-09	3.0E-02	na	na	1.0E-03	Inc	Inc	0.001
										HI	**0.0078**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-182

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 33 - Upper Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	660	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	528	1.9E-03	Inc	9.5E-08	1.0E-01	na	2.9E-01	1.9E-02	Inc	3.3E-07	0.019
Diesel Range Organics, Aromatic	264	9.6E-04	Inc	4.8E-08	4.0E-02	na	5.7E-01	2.4E-02	Inc	8.4E-08	0.024
Residual Range Organics	2,100	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,890	6.9E-03	Inc	3.4E-07	2.0E+00	na	na	3.4E-03	Inc	Inc	0.0034
Residual Range Organics, Aromatic	630	2.3E-03	Inc	1.1E-07	3.0E-02	na	na	7.6E-02	Inc	Inc	0.076
										HI	**0.12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-183

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 33 - Upper Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	660	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	528	5.8E-03	Inc	2.9E-07	1.0E-01	na	2.9E-01	5.8E-02	Inc	9.9E-07	0.058
Diesel Range Organics, Aromatic	264	2.9E-03	Inc	1.4E-07	4.0E-02	na	5.7E-01	7.2E-02	Inc	2.5E-07	0.072
Residual Range Organics	2,100	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,890	2.1E-02	Inc	1.0E-06	2.0E+00	na	na	1.0E-02	Inc	Inc	0.010
Residual Range Organics, Aromatic	630	6.9E-03	Inc	3.4E-07	3.0E-02	na	na	2.3E-01	Inc	Inc	0.23
										HI	**0.37**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-184

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 33 - Upper Tram Terminal - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a]	Soil Ingestion Dose	Dermal Dose	Dust Inhalation Dose	Reference Dose (mg/kg-d)			Pathway-Specific Hazard Soil		Pathway-Specific Hazard Dust	Chemical-Specific
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	660	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	528	1.5E-05	Inc	4.6E-09	1.0E-01	na	2.9E-01	1.5E-04	Inc	1.6E-08	0.00015
Diesel Range Organics, Aromatic	264	7.5E-06	Inc	2.3E-09	4.0E-02	na	5.7E-01	1.9E-04	Inc	4.1E-09	0.00019
Residual Range Organics	2,100	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,890	5.4E-05	Inc	1.7E-08	2.0E+00	na	na	2.7E-05	Inc	Inc	0.000027
Residual Range Organics, Aromatic	630	1.8E-05	Inc	5.5E-09	3.0E-02	na	na	6.0E-04	Inc	Inc	0.00060
										HI	**0.00097**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-185

NONCANCER HAZARD CALCULATIONS FOR A FUTURE SEASONAL RESIDENT
SITE 34 - Upper Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	880	3.2E-03	Inc	1.6E-07	1.0E-01	na	2.9E-01	3.2E-02	Inc	5.5E-07	0.032
Diesel Range Organics, Aromatic	440	1.6E-03	Inc	7.9E-08	4.0E-02	na	5.7E-01	4.0E-02	Inc	1.4E-07	0.040
Residual Range Organics	1,162	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,046	3.8E-03	Inc	1.9E-07	2.0E+00	na	na	1.9E-03	Inc	Inc	0.0019
Residual Range Organics, Aromatic	349	1.3E-03	Inc	6.3E-08	3.0E-02	na	na	4.2E-02	Inc	Inc	0.042
										HI	**0.12**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-186

NONCANCER HAZARD CALCULATIONS FOR A FUTURE PERMANENT RESIDENT
SITE 34 - Upper Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	880	9.6E-03	Inc	4.8E-07	1.0E-01	na	2.9E-01	9.6E-02	Inc	1.6E-06	0.10
Diesel Range Organics, Aromatic	440	4.8E-03	Inc	2.4E-07	4.0E-02	na	5.7E-01	1.2E-01	Inc	4.2E-07	0.12
Residual Range Organics	1,162	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,046	1.1E-02	Inc	5.7E-07	2.0E+00	na	na	5.7E-03	Inc	Inc	0.0057
Residual Range Organics, Aromatic	349	3.8E-03	Inc	1.9E-07	3.0E-02	na	na	1.3E-01	Inc	Inc	0.13
										HI	**0.35**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium.
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

TABLE F-187

NONCANCER HAZARD CALCULATIONS FOR A CURRENT/FUTURE INCIDENTAL VISITOR
SITE 34 - Upper Camp - SOIL
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

Constituent	Soil Concentration[a] (mg/kg)	Soil Ingestion Dose (mg/kg-d)	Dermal Dose (mg/kg-d)	Dust Inhalation Dose (mg/kg-d)	Reference Dose (mg/kg-d) Oral	Dermal	Inhalation	Pathway-Specific Hazard Soil Ingestion	Dermal	Dust Inhalation	Chemical-Specific HQ
PETROLEUM HYDROCARBONS[c]											
Diesel Range Organics	1,100	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]	na[d]
Diesel Range Organics, Aliphatic	880	2.5E-05	Inc	7.7E-09	1.0E-01	na	2.9E-01	2.5E-04	Inc	2.7E-08	0.00025
Diesel Range Organics, Aromatic	440	1.3E-05	Inc	3.9E-09	4.0E-02	na	5.7E-01	3.1E-04	Inc	6.8E-09	0.00031
Residual Range Organics	1,162	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]	na[e]
Residual Range Organics, Aliphatic	1,046	3.0E-05	Inc	9.2E-09	2.0E+00	na	na	1.5E-05	Inc	Inc	0.000015
Residual Range Organics, Aromatic	349	1.0E-05	Inc	3.1E-09	3.0E-02	na	na	3.3E-04	Inc	Inc	0.00033
										HI	**0.00091**

Notes:

[a] Based on the maximum or 95 percent upper confidence limit (95% UCL) on the mean concentration detected at the site.

[b] Consistent with EPA policy, lead is not evaluated in the cumulative HI estimate.

[c] Risks associated with indicator compounds are included in cumulative risk and hazard estimates for each site. However, the health hazards associated with petroleum mixtures will be evaluated and reported separately.

[d] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as DRO (method 8100) by segregating total DRO concentrations into aliphatic and aromatic fractions, assuming 80% aliphatic hydrocarbons and 40% aromatic hydrocarbons (ADEC, 2000c).

[e] Exposure dose and noncancer hazards were calculated for petroleum hydrocarbons measured as RRO (method) by segregating total RRO concentrations into aliphatic and aromatic fractions, assuming 90% aliphatic hydrocarbons and 30% aromatic hydrocarbons (ADEC, 2000c).

1) Doses and noncancer hazards shown only for noncarcinogenic chemicals with available toxicity values.
2) Absorbed doses were calculated for dermal contact with the medium, and intakes were calculated for ingestion or inhalation of a medium
3) Noncancer hazards are unitless values which represent the probability of incurring an adverse health effect. They are calculated using the following formula: Noncancer HI = Exposure Dose/Reference dose.

HI	Hazard index.
HQ	Hazard quotient.
Inc	Incomplete pathway.
mg/kg	Milligrams per kilogram.
mg/kd-d	Milligrams per kilogram per day.
na	not available

APPENDIX G

Ecological Tier 1 Screening Tables

Table G-1
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 3
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Gravel Data: Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg): Soil Tundra	Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Inorganics										
Chromium	12	9.8	2	2	1.0	48	50	5	0.5	No
Copper	22	9	2	2	1.0	107	44	61	6.1	No
Lead	119	27	3	3	1.0	106	112	50	5	Yes
Nickel	16	8	2	2	1.0	59	30	30	3	No
Zinc	118	35	2	2	1.0	615	157	120	12	No
VOCs										
Methylene chloride	0.0093	0.0093	1	1	1.0	nc	nc	21.4	2.14	No
PCBs										
PCB-1260 (Aroclor 1260)	0.75	0.29	2	2	1.0	nc	nc	0.111	0.0111	Yes
PAHs										
Anthracene	10.29	10.29	3	1	0.3	nc	nc	1.98	0.198	Yes
Naphthalene	50.8	50.8	4	1	0.3	nc	nc	1.98	0.198	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3,760	314	3	3	1.0	nc	nc	na	na	Yes
TRPH	6,550	393	3	3	1.0	nc	nc	NA [c]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)

Table G-1
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 3
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Gravel Data: Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] TRPH is excluded as a COPEC due to outdated analysis methods.

BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
NA - Not applicable.
VOCs - Volatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-2
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Subsurface Water
Site 3
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Shallow Subsurface Water Data: Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Subsurface Water BUTL (mg/L): Shallow	Deep	Ecological Benchmark[a] (mg/L)	COPEC Screening Benchmark[b] (mg/L)	COPEC? (Yes/No)
VOCs										
Ethylbenzene	0.066	0.066	1	1	1.0	na	na	3.2	0.32	No
Xylenes	0.54	0.54	1	1	1.0	nc	nc	na	na	Yes
PAHs										
Fluorene	0.0012	0.0012	1	1	1.0	nc	nc	0.03	0.003	No
Naphthalene	0.013	0.013	1	1	1.0	nc	nc	0.62	0.062	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	14	1.8	4	4	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	8.1	1.3	3	3	1.0	nc	nc	na	na	Yes

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
5) Lowest Chronic Value observed in freshwater daphnids
   ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.
   Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds

Table G-2
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Subsurface Water
Site 3
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data									
			Number of			Subsurface Water BUTL (mg/L)		Ecological	COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Detection Frequency	Shallow	Deep	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)

PAH - Polynuclear Aromatic Hydrocarbons

Table G-3
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 4
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
PAHs															
Anthracene	na	na	na	na	na	14	14	1	1	1.0	nc	nc	1.98	0.198	Yes
Chrysene	na	na	na	na	na	11	11	1	1	1.0	nc	nc	1.98	0.198	Yes
Fluorene	na	na	na	na	na	13	13	1	1	1.0	nc	nc	30	3.0	Yes
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	5,300	150	3	3	1.0	459	459	1	1	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	na	na	na	na	na	3,420	3,420	1	1	1.0	nc	nc	na	na	Yes
TRPH	47,000	690	3	3	1.0	na	na	na	na	na	nc	nc	NA [d]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
Soil invertebrate benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. (Table 1)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Benchmark Criteria is equal to 1/10 the indicated regulatory criteria.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/kg - Milligrams per kilogram.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
PAHs - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-4
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Subsurface Water
Site 4
Northeast Cape, St. Lawrence Island, Alaska

	Shallow Subsurface Water Data									
	Maximum	Maximum	Number of		Detection	Subsurface Water BUTL (mg/L)		Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Shallow	Deep	(mg/L)	(mg/L)	(Yes/No)
VOCs										
Xylenes	0.0069	0.0069	1	1	1.0	nc	nc	na	na	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3.7	0.96	4	4	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	6.5	2.6	3	3	1.0	nc	nc	na	na	Yes

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
5) Lowest Chronic Value observed in freshwater daphnids
   ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.
   Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds

Table G-5
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data					BUTL (mg/kg)		Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
Constituent	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Aluminum	9,850	9,850	1	1	1.0	7,790	7,790	1	1	1.0	30,357	nc	50	5	Yes
Arsenic	4.1	4.1	1	1	1.0	1.6	1.6	1	1	1.0	7.8	11	37	3.7	No
Barium	54	54	1	1	1.0	53	53	1	1	1.0	174	nc	500	50	No
Beryllium	0.80	0.80	4	1	0.25	1.3	0.6	9	2	0.2	3.8	nc	10	1	No
Cadmium						2.0	1.5	9	5	0.6	1.4	3.1	0.38	0.038	No
Calcium	2,360	2,360	1	1	1.0	1,790	1,790	1	1	1.0	nc	nc	NA [c]	NA	No
Chromium	20	14	4	3	0.75	18	6.0	9	9	1.0	48	50	5	0.5	No
Cobalt	5.1	5.1	1	1	1.0	2.0	2.0	1	1	1.0	49	nc	32	3.2	No
Copper	23	8.0	4	4	1.0	17	7.4	9	9	1.0	107	44	61	6.1	No
Iron	16,400	16,400	1	1	1.0	12,200	12,200	1	1	1.0	nc	nc	NA [c]	NA	No
Lead	34	13	4	4	1.0	71	8.0	9	9	1.0	106	112	50	5	No
Magnesium	2,900	2,900	1	1	1.0	1,530	1,530	1	1	1.0	nc	nc	NA [c]	NA	No
Manganese	164	164	1	1	1.0	73	73	1	1	1.0	1,589	nc	500	50	Yes
Nickel	15	9.0	4	3	0.75	10	5.0	9	9	1.0	59	30	30	3	No
Potassium	820	820	1	1	1.0	1,500	1,500	1	1	1.0	nc	nc	NA [c]	NA	No
Sodium	160	160	1	1	1.0	450	450	1	1	1.0	nc	nc	NA [c]	NA	No
Thallium						0.29	0.29	2	1	0.5	1.6	0.56	1	0.1	No
Vanadium	26	26	1	1	1.0	16	16	1	1	1.0	73	nc	2	0.2	No
Zinc	93	29.8	4	4	1.0	172	20	9	9	1.0	615	157	120	12	Yes
VOCs															
Ethylbenzene	0.00088	0.00088	5	1	0.20	0.012	0.012	9	1	0.11	nc	nc	52.2	5.22	No
m,p-Xylene	0.0033	0.0033	2	1	0.50	0.044	0.044	3	1	0.33	nc	nc	4.162	0.4162	No
Methylene chloride	0.0076	0.0076	1	1	1.0	0.0079	0.0044	2	2	1.0	nc	nc	21.4	2.14	No
o-Xylene	0.001	0.001	2	1	0.50	0.014	0.014	3	1	0.33	nc	nc	4.162	0.4162	No
Toluene	0.0047	0.0047	5	1	0.20	0.078	0.0052	9	3	0.33	nc	nc	200	20	No
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	4,660	34	4	4	1.0	102,000	12	13	13	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	220	220	1	1	1.0	8,500	880	5	5	1.0	nc	nc	na	na	Yes
TRPH	19,200	31	3	3	1.0	262,000	67	8	8	1.0	nc	nc	NA [d]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
Soil invertebrate benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. (Table 1)
3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

Table G-5
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 6
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[i]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/kg - Milligrams per kilogram.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
TRPH - Total Residual Petroleum Hydrocarbons

Table G-6
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 06
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	Fresh Surface	Ephemeral	Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Water	Surface Water	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Lead	0.005	0.005	2	1	0.50	nc	0.014	0.003	0.00025	No
Zinc	0.1	0.1	2	1	0.50	nc	0.90	0.11	0.011	No
Inorganics, Dissolved										
Zinc, Dissolved	0.06	0.06	2	1	0.50	nc	0.093	0.11	0.011	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	1.8	1.8	3	1	0.33	nc	nc	na	na	Yes
TRPH	16	1.3	2	2	1.0	nc	nc	NA c	NA	No

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids
ORNL, 1996. Toxicological Benchmarks for Screening Potential
Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

[c] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.

Table G-7
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Tundra Data: Maximum Detect (mg/kg)	Soil Tundra Data: Minimum Detect (mg/kg)	Soil Tundra Data: Number of Samples	Soil Tundra Data: Number of Detects	Soil Tundra Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Inorganics										
Aluminum	12,000	3,640	5	5	1.0	30,357	nc	50	5	No
Arsenic	50	2.0	18	18	1.0	7.8	11	37	3.7	Yes
Barium	135	28	5	5	1.0	174	nc	500	50	No
Beryllium	2.3	0.40	19	8	0.42	3.8	nc	10	1	No
Cadmium	4.1	1.0	19	9	0.47	1.4	3.1	0.38	0.038	Yes
Calcium	5,070	1780	5	5	1.0	nc	nc	NA [c]	NA	No
Chromium	100	5.0	19	18	0.95	48	50	5	0.5	Yes
Cobalt	19	2.0	5	5	1.0	49	nc	32	3.2	No
Copper	320	6.6	19	19	1.0	107	44	61	6.1	Yes
Iron	152,000	8,380	5	5	1.0	nc	nc	NA [c]	NA	No
Lead	460	10	20	20	1.0	106	112	50	5	Yes
Magnesium	3,180	740	5	5	1.0	nc	nc	NA [c]	NA	No
Manganese	694	55.3	5	5	1.0	1,589	nc	500	50	No
Mercury	0.56	0.10	18	4	0.22	0.43	nc	0.1	0.01	Yes
Nickel	280	5.0	19	16	0.84	59	30	30	3	Yes
Potassium	1,080	370	5	5	1.0	nc	nc	NA [c]	NA	No
Silver	2.0	2.0	19	2	0.11	nc	nc	2	0.2	Yes
Sodium	210	120	5	5	1.0	nc	nc	NA [c]	NA	No
Thallium	1.2	0.28	2	2	1.0	1.6	0.56	1	0.1	No
Vanadium	31	9.8	5	5	1.0	73	nc	2	0.2	No
Zinc	540	29	19	19	1.0	615	157	120	12	No
VOCs										
1,1,1-Trichloroethane	0.28	0.14	10	3	0.30	nc	nc	2,060	206	No
Acetone	1.4	0.048	10	4	0.40	nc	nc	36.6	3.66	No
Bromomethane	0.40	0.098	10	5	0.50	nc	nc	na	na	Yes
m,p-Xylene	0.13	0.13	10	1	0.10	nc	nc	4.162	0.4162	No
Methylene chloride	0.013	0.0065	9	4	0.44	nc	nc	21.4	2.14	No

Table G-7
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Toluene	0.14	0.026	19	3	0.16	nc	nc	200	20	No
SVOCs										
4-Methylphenol (p-Cresol)	3.85	1.65	14	3	0.21	nc	nc	30	3	Yes
Di-n-butyl phthalate	3.04	3.04	14	1	0.07	nc	nc	200	20	No
PCBs										
PCB-1260 (Aroclor 1260)	13	0.13	22	4	0.18	nc	nc	0.111	0.0111	Yes
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0.0000011	13	4	0.31	nc	nc	0.00006	0.000006	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxi	0.020	0.00000091	13	12	0.92	nc	nc	0.00006	0.000006	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0.00000043	12	4	0.33	nc	nc	0.00006	0.000006	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	0.0011	0.00000047	13	8	0.62	nc	nc	0.00006	0.000006	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0000013	0.0000013	13	1	0.08	nc	nc	0.00006	0.000006	No
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000027	0.00000012	13	4	0.31	nc	nc	0.00006	0.000006	Yes
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0000020	0.0000020	13	1	0.08	nc	nc	0.00006	0.000006	No
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0.000011	13	1	0.08	nc	nc	0.00006	0.000006	Yes
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000046	0.00000019	13	4	0.31	nc	nc	0.00006	0.000006	Yes
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000040	0.00000040	13	1	0.08	nc	nc	0.00006	0.000006	No
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.000031	0.0000051	13	2	0.15	nc	nc	0.00006	0.000006	Yes
1,2,3,7,8-Pentachlorodibenzofuran	0.0000045	0.0000045	13	1	0.08	nc	nc	0.00059	0.000059	No
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0000015	0.0000015	13	1	0.08	nc	nc	0.00006	0.000006	No
2,3,4,6,7,8-Hexachlorodibenzofuran	0.000019	0.00000041	13	8	0.62	nc	nc	0.00006	0.000006	Yes
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0.000012	13	1	0.08	nc	nc	0.00006	0.000006	Yes
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0.00000028	13	6	0.46	nc	nc	8E-07	0.00000008	Yes
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0.00053	3	1	0.33	nc	nc	0.00006	0.000006	Yes
Total Heptachlorodibenzo-p-dioxins (HpC	0.0022	0.000095	3	2	0.67	nc	nc	0.00006	0.000006	Yes
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0.00019	3	1	0.33	nc	nc	0.00006	0.000006	Yes
Total Hexachlorodibenzo-p-dioxins (HxC	0.00034	0.00034	3	1	0.33	nc	nc	0.00006	0.000006	Yes

Table G-7
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0.00011	3	1	0.33	nc	nc	0.00006	0.000006	Yes
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0.00015	3	1	0.33	nc	nc	8E-07	0.00000008	Yes
Total Tetrachlorodibenzo-p-dioxins (TCD	0.000039	0.000039	3	1	0.33	nc	nc	8E-07	0.00000008	Yes
PAHs										
2-Methylnaphthalene	0.047	0.047	19	1	0.053	nc	nc	1.98	0.198	No
Benzo(a)pyrene	0.082	0.082	19	1	0.053	nc	nc	1.98	0.198	No
Benzo(b)fluoranthene	0.014	0.014	19	1	0.053	nc	nc	1.98	0.198	No
Benzo(k)fluoranthene	0.014	0.014	19	1	0.053	nc	nc	1.98	0.198	No
Chrysene	0.035	0.013	19	2	0.11	nc	nc	1.98	0.198	No
Naphthalene	0.027	0.027	20	1	0.050	nc	nc	1.98	0.198	No
Phenanthrene	0.014	0.014	19	1	0.053	nc	nc	1.98	0.198	No
Pyrene	0.026	0.013	19	2	0.11	nc	nc	1.98	0.198	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	32,000	11	24	21	0.88	nc	nc	na	na	Yes
Residual Range Organics (RRO)	3,900	620	7	7	1.0	nc	nc	na	na	Yes
TRPH	156,000	18	14	14	1.0	nc	nc	NA [d]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

Table G-7
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-8
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 7
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
			Number of		Detection			Benchmark	Benchmark[b]	COPEC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Frequency	Fresh Surface Water	Ephemeral Surface Water	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Aluminum	0.32	0.24	2	2	1.0	nc	2.2	0.087	0.0087	No
Arsenic	0.0165	0.0165	5	1	0.20	nc	nc	0.15	0.015	Yes
Barium	0.012	0.008	2	2	1.0	nc	0.034	na	na	Yes
Calcium	4.99	3.32	2	2	1.0	nc	nc	NA c	NA	No
Chromium	0.020	0.020	5	1	0.20	nc	nc	0.074	0.0074	Yes
Copper	0.075	0.0020	5	3	0.60	nc	0.083	0.009	0.0009	No
Iron	3.66	1.16	2	2	1.0	nc	nc	NA c	NA	No
Lead	0.065	0.0020	5	5	1.0	nc	0.014	0.003	0.00025	Yes
Magnesium	1.44	1.28	2	2	1.0	nc	nc	NA c	NA	No
Manganese	0.096	0.0070	2	2	1.0	nc	0.12	1.1	0.11	No
Nickel	0.0525	0.0525	5	1	0.20	nc	nc	0.052	0.0052	Yes
Potassium	0.81	0.81	2	1	0.50	nc	nc	NA c	NA	No
Sodium	6.29	4.72	2	2	1.0	nc	nc	NA c	NA	No
Thallium	0.0024	0.0024	5	1	0.20	nc	nc	0.04	0.004	Yes
Zinc	0.81	0.019	5	5	1.0	nc	0.90	0.11	0.011	No
Inorganics, Dissolved										
Mercury, Dissolved	0.000375	0.000375	3	1	0.33	nc	nc	1E-05	0.0000012	Yes
Thallium, Dissolved	0.0012	0.0012	3	1	0.33	nc	nc	0.04	0.004	Yes
Zinc, Dissolved	0.07	0.07	3	1	0.33	nc	0.093	0.11	0.011	No
VOCs										
Toluene	0.0038	0.0038	5	1	0.20	nc	nc	5	0.5	No
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0000052	0.0000052	3	1	0.33	nc	nc	1E-08	0.000000001	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00000071	0.00000071	3	1	0.33	nc	nc	1E-08	0.000000001	Yes
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0000014	0.0000014	3	1	0.33	nc	nc	1E-08	0.000000001	Yes
Petroleum Hydrocarbons										
DRO	11.6	0.20	5	2	0.40	nc	nc	na	na	Yes
TRPH	6.25	6.25	3	1	0.33	nc	nc	NA d	NA	No

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value

Table G-8
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 7
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological Benchmark	COPEC Screening Benchmark[b]	COPEC?
	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	(mg/L)	(mg/L)	(Yes/No)

NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids
ORNL, 1996. Toxicological Benchmarks for Screening Potential
Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
TRPH - Total residual petroleum hydrocarbons.

Table G-9
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Tundra Data: Maximum Detect (mg/kg)	Soil Tundra Data: Minimum Detect (mg/kg)	Soil Tundra Data: Number of Samples	Soil Tundra Data: Number of Detects	Soil Tundra Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Inorganics										
Aluminum	0.0000036	0.0000036	5	1	0.20	30,357	nc	50	5	No
Antimony	14	14	15	1	0.067	nc	nc	0.29	0.029	Yes
Arsenic	20	3.6	15	7	0.47	7.8	11	37	3.7	Yes
Beryllium	3.55	0.70	15	5	0.33	3.8	nc	10	1	No
Cadmium	7.0	0.75	15	4	0.27	1.4	3.1	0.38	0.038	Yes
Calcium	4,940	1910	5	5	1.0	nc	nc	NA [c]	NA	No
Chromium	60	5.0	15	14	0.93	48	50	5	0.5	Yes
Cobalt	38	4.0	5	4	0.80	49	nc	32	3.2	No
Copper	429	6.0	15	15	1.0	107	44	61	6.1	Yes
Iron	483,000	13,000	5	5	1.0	nc	nc	NA [c]	NA	No
Lead	630	20	15	14	0.93	106	112	50	5	Yes
Magnesium	3,220	930	5	5	1.0	nc	nc	NA [c]	NA	No
Manganese	970	51	5	5	1.0	1,589	nc	500	50	No
Mercury	0.60	0.60	15	1	0.07	0.43	nc	0.1	0.01	Yes
Nickel	110	7.7	15	11	0.73	59	30	30	3	Yes
Potassium	1,060	650	5	4	0.80	nc	nc	NA [c]	NA	No
Selenium	1.0	1.0	15	1	0.07	nc	nc	1	0.1	Yes
Sodium	280	180	5	5	1.0	nc	nc	NA [c]	NA	No
Thallium	0.28	0.28	2	1	0.50	1.6	0.56	1	0.1	No
Vanadium	44	21	5	4	0.80	73	nc	2	0.2	No
Zinc	1,790	15	15	15	1.0	615	157	120	12	Yes
VOCs										
1,1,1-Trichloroethane	0.20	0.20	8	1	0.13	nc	nc	2060	206	No
1,2,4-Trichlorobenzene	0.00018	0.000040	15	3	0.20	nc	nc	20	2	No
1,2-Dibromoethane	0.000010	0.0000097	8	2	0.25	nc	nc	na	na	Yes
1,2-Dichlorobenzene	0.025	0.0000016	15	7	0.47	nc	nc	na	na	Yes
1,2-Dichloroethane	0.00079	0.000014	8	5	0.63	nc	nc	14.2	1.42	No

Table G-9
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data									
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Ecological	COPEC Screening	
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	Benchmark[a] (mg/kg)	Benchmark[b] (mg/kg)	COPEC? (Yes/No)
1,2-Dichloropropane	0.00040	0.0000070	8	4	0.50	nc	nc	700	70	No
1,3,5-Trimethylbenzene	0.00018	0.0000013	8	5	0.63	nc	nc	52.2	5.22	No
1,3-Dichlorobenzene	0.068	0.00000025	15	7	0.47	nc	nc	na	na	Yes
1,3-Dichloropropane	0.000097	0.00000059	8	5	0.63	nc	nc	na	na	Yes
1,4-Dichlorobenzene	0.025	0.000014	15	3	0.20	nc	nc	20	2	No
2,2-Dichloropropane	0.00000092	0.00000092	8	1	0.13	nc	nc	na	na	Yes
2-Butanone	0.0000045	0.00000059	8	2	0.25	nc	nc	6,487	649	No
2-Chloroethyl vinyl ether	0.0000026	0.00000054	5	2	0.40	nc	nc	na	na	Yes
2-Chlorotoluene	0.0000045	0.0000013	8	2	0.25	nc	nc	na	na	Yes
2-Hexanone	0.0000087	0.0000078	5	2	0.40	nc	nc	na	na	Yes
4-Bromophenyl phenyl ether	0.0000024	0.0000012	10	2	0.20	nc	nc	na	na	Yes
4-Chlorophenyl phenyl ether	0.0000029	0.00000064	10	2	0.20	nc	nc	na	na	Yes
4-Isopropyltoluene	0.0000047	0.00000077	8	3	0.38	nc	nc	na	na	Yes
Acetone	0.000013	0.0000048	8	2	0.25	nc	nc	36.6	3.66	No
Bromomethane	0.36	0.36	8	1	0.13	nc	nc	na	na	Yes
Styrene	0.014	0.014	8	1	0.13	nc	nc	300	30	No
Toluene	6.0	0.23	16	2	0.13	nc	nc	200	20	No
SVOCs										
2,4,5-Trichlorophenol	0.0000032	0.0000032	10	1	0.10	nc	nc	9	0.9	No
2,4,6-Trichlorophenol	0.0000025	0.0000011	10	2	0.20	nc	nc	10	1	No
2,4-Dichlorophenol	0.0000015	0.00000034	10	2	0.20	nc	nc	na	na	Yes
2,4-Dimethylphenol	0.0000014	0.0000014	10	1	0.10	nc	nc	na	na	Yes
2,4-Dinitrophenol	0.0000016	0.0000016	10	1	0.10	nc	nc	20	2	No
2,4-Dinitrotoluene	0.0000016	0.0000016	10	1	0.10	nc	nc	na	na	Yes
2,6-Dinitrotoluene	0.0000016	0.0000016	10	1	0.10	nc	nc	na	na	Yes
2-Methyl-4,6-dinitrophenol	0.0000037	0.00000022	10	3	0.30	nc	nc	na	na	Yes
2-Methylphenol (o-Cresol)	0.00000035	0.00000035	10	1	0.10	nc	nc	na	na	Yes
3,3-Dichlorobenzidine	0.00000068	0.00000068	10	1	0.10	nc	nc	na	na	Yes
3-Nitroaniline	0.0000019	0.00000080	10	2	0.20	nc	nc	na	na	Yes

Table G-9
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
4-Chloroaniline	0.0000026	0.00000061	10	2	0.20	nc	nc	na	na	Yes
4-Chlorotoluene	0.025	0.00000043	8	4	0.50	nc	nc	na	na	Yes
4-Nitroaniline	0.000030	0.000030	10	1	0.10	nc	nc	na	na	Yes
4-Nitrophenol	0.00013	0.0000088	10	3	0.30	nc	nc	7	0.7	No
bis-(2-ethylhexyl)phthalate	1.0	1.0	10	1	0.10	nc	nc	200	20	No
PCBs										
PCB-1260 (Aroclor 1260)	0.13	0.13	15	1	0.067	nc	nc	0.111	0.0111	Yes
Pesticides										
4,4'-DDD	0.0000019	0.0000019	10	1	0.10	nc	nc	0.002	0.0002	No
4,4'-DDE	0.0000016	0.0000016	10	1	0.10	nc	nc	0.002	0.0002	No
4,4'-DDT	0.00000054	0.00000017	10	3	0.30	nc	nc	0.002	0.0002	No
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00012	0.0000038	10	6	0.60	nc	nc	6E-05	0.000006	Yes
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxi	0.0011	0.0000070	10	9	0.90	nc	nc	6E-05	0.000006	Yes
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000030	0.00000025	10	7	0.70	nc	nc	6E-05	0.000006	Yes
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	0.00012	0.00000059	10	8	0.80	nc	nc	6E-05	0.000006	Yes
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0000023	0.0000023	9	1	0.11	nc	nc	6E-05	0.000006	No
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0000066	0.00000023	10	4	0.40	nc	nc	6E-05	0.000006	Yes
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0000029	0.0000011	10	4	0.40	nc	nc	6E-05	0.000006	No
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0000016	0.0000014	10	2	0.20	nc	nc	6E-05	0.000006	No
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0000045	0.00000059	9	2	0.22	nc	nc	6E-05	0.000006	No
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000038	0.00000038	10	1	0.10	nc	nc	6E-05	0.000006	No
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000083	0.0000012	10	4	0.40	nc	nc	6E-05	0.000006	Yes
1,2,3,7,8-Pentachlorodibenzofuran	0.0000021	0.00000022	10	3	0.30	nc	nc	6E-04	0.000059	No
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00000035	0.00000035	9	1	0.11	nc	nc	6E-05	0.000006	No
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000032	0.00000080	10	4	0.40	nc	nc	6E-05	0.000006	No
2,3,4,7,8-Pentachlorodibenzofuran	0.0000025	0.00000033	10	3	0.30	nc	nc	6E-05	0.000006	No

Table G-9
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
2,3,7,8-Tetrachlorodibenzofuran	0.0000066	0.00000026	10	7	0.70	nc	nc	8E-07	0.00000008	Yes
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000017	0.00000028	10	3	0.30	nc	nc	3E-07	0.00000003	Yes
Total Heptachlorodibenzofurans (HpCDF)	0.000095	0.000095	3	1	0.33	nc	nc	6E-05	0.000006	Yes
Total Heptachlorodibenzo-p-dioxins (HpC	0.00018	0.000040	3	2	0.67	nc	nc	6E-05	0.000006	Yes
Total Tetrachlorodibenzofurans (TCDF)	0.00001	0.0000097	3	2	0.67	nc	nc	8E-07	0.00000008	Yes
PAHs										
2-Methylnaphthalene	0.0000021	0.0000011	16	2	0.13	nc	nc	1.98	0.198	No
Acenaphthene	0.000029	0.00000088	16	8	0.50	nc	nc	20	2.0	No
Acenaphthylene	0.000055	0.00000099	16	7	0.44	nc	nc	1.98	0.198	No
Anthracene	0.0092	0.0092	16	1	0.063	nc	nc	1.98	0.198	No
Benzo(k)fluoranthene	0.057	0.057	16	1	0.063	nc	nc	1.98	0.198	No
Chrysene	0.064	0.064	16	1	0.063	nc	nc	1.98	0.198	No
Fluoranthene	0.023	0.023	16	1	0.063	nc	nc	1.98	0.198	No
Indeno(1,2,3-cd)pyrene	0.018	0.018	16	1	0.063	nc	nc	1.98	0.198	No
Phenanthrene	0.024	0.024	16	1	0.063	nc	nc	1.98	0.198	No
Pyrene	0.041	0.041	16	1	0.063	nc	nc	1.98	0.198	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	510	8.9	16	16	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	2,100	53	6	6	1.0	nc	nc	na	na	Yes
TRPH	5,260	169	10	10	1.0	nc	nc	NA [d]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)

Table G-9
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-10
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)
Inorganics, Total										
Aluminum	0.23	0.040	6	6	1.0	nc	2.2	0.087	0.0087	No
Barium	0.020	0.0050	6	6	1.0	nc	0.034	na	na	Yes
Calcium	3.0	1.0	6	6	1.0	nc	nc	NA c	NA	No
Copper	0.0040	0.0040	9	1	0.11	nc	0.083	0.009	0.0009	No
Iron	1.5	0.14	6	6	1.0	nc	nc	NA	NA	No
Lead	0.011	0.0060	9	2	0.22	nc	0.014	0.003	0.00025	No
Magnesium	0.95	0.82	6	6	1.0	nc	nc	NA c	NA	No
Manganese	0.029	0.0060	6	6	1.0	nc	0.12	1.1	0.11	No
Potassium	1.0	0.52	6	2	0.33	nc	nc	NA c	NA	No
Sodium	4.4	4.0	6	6	1.0	nc	nc	NA c	NA	No
Zinc	0.060	0.011	9	2	0.22	nc	0.90	0.11	0.011	No
Inorganics, Dissolved										
Zinc, Dissolved	0.060	0.060	3	1	0.33	nc	0.093	0.11	0.011	Yes
Dioxins & Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0000037	0.0000037	3	1	0.33	nc	nc	1E-08	0.000000001	Yes

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids
ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.
Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

Table G-10
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 9
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.

Table G-11
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics										
Aluminum	33,100	3,975	10	10	1.00	30,357	nc	50	5	Yes
Antimony	38	38	19	1	0.053	nc	nc	0.29	0.029	Yes
Arsenic	170	2.8	19	19	1.0	7.8	11	37	3.7	Yes
Barium	193	56.5	10	10	1.0	174	nc	500	50	Yes
Beryllium	1.8	0.30	19	9	0.47	3.8	nc	10	1	No
Cadmium	69	0.40	19	8	0.42	1.4	3.1	0.38	0.038	Yes
Calcium	6,910	1,320	10	10	1.0	nc	nc	NA [c]	NA	No
Chromium	93	4.0	19	19	1.0	48	50	5	0.5	Yes
Cobalt	14.2	2.5	10	10	1.0	49	nc	32	3.2	No
Copper	130	4.0	19	19	1.0	107	44	61	6.1	Yes
Iron	57,400	12,700	10	10	1.0	nc	nc	NA [c]	NA	No
Lead	88	6.1	19	18	0.95	106	112	50	5	No
Magnesium	8,770	1,320	10	10	1.0	nc	nc	NA [c]	NA	No
Manganese	786	77	10	10	1.0	1,589	nc	500	50	No
Mercury	4.8	0.070	19	6	0.32	0.43	nc	0.1	0.01	Yes
Nickel	44	9.8	19	14	0.74	59	30	30	3	No
Potassium	3,670	560	10	10	1.0	nc	nc	NA [c]	NA	No
Selenium	2.0	1.0	19	3	0.16	nc	nc	1	0.1	Yes
Silver	6.7	0.90	19	3	0.16	nc	nc	2	0.2	Yes
Sodium	580	170	10	10	1.0	nc	nc	NA [c]	NA	No
Thallium	0.53	0.53	1	1	1.0	1.6	0.56	1	0.1	No
Vanadium	81	8.5	10	10	1.0	73	nc	2	0.2	Yes
Zinc	1,130	24	19	19	1.0	615	157	120	12	Yes
VOCs										
1,1,1-Trichloroethane	0.016	0.016	4	1	0.25	nc	nc	2,060	206	No
1,2,4-Trimethylbenzene	0.19	0.032	4	2	0.50	nc	nc	52.2	5.22	No

Table G-11
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data							Ecological	COPEC Screening	
	Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent			Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
1,3,5-Trimethylbenzene	0.071	0.012	4	2	0.50	nc	nc	52.2	5.22	No
2-Butanone	0.18	0.043	4	3	0.75	nc	nc	6,487	648.7	No
Acetone	0.53	0.036	4	4	1.0	nc	nc	36.6	3.66	No
Ethylbenzene	0.0067	0.0067	19	1	0.053	nc	nc	52.2	5.22	No
Isopropylbenzene	0.013	0.013	4	1	0.25	nc	nc	52.2	5.22	No
m,p-Xylene	0.096	0.0074	14	7	0.50	nc	nc	4.162	0.4162	No
Methylene chloride	0.0060	0.0060	4	1	0.25	nc	nc	21.4	2.14	No
n-Butylbenzene	0.062	0.062	4	1	0.25	nc	nc	52.2	5.22	No
n-Propylbenzene	0.040	0.040	4	1	0.25	nc	nc	52.2	5.22	No
o-Xylene	0.0063	0.0063	14	1	0.071	nc	nc	4.162	0.4162	No
sec-Butylbenzene	0.036	0.036	4	1	0.25	nc	nc	52.2	5.22	No
Toluene	0.14	0.0060	19	13	0.68	nc	nc	200	20	No
										No
SVOCs										
4-Chloroaniline	5.47	5.47	9	1	0.11	nc	nc	na	na	Yes
bis-(2-ethylhexyl)phthalate	0.98	0.84	9	2	0.22	nc	nc	200	20	No
Di-n-butyl phthalate	5.69	0.90	9	4	0.44	nc	nc	200	20	No
PCBs										
PCB-1254 (Aroclor 1254)	0.14	0.14	19	2	0.11	nc	nc	0.111	0.0111	Yes
PCB-1260 (Aroclor 1260)	3.0	0.15	19	4	0.21	nc	nc	0.111	0.0111	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	3,800	46	19	16	0.84	nc	nc	na	na	Yes
Residual Range Organics (RRO)	3,700	25	10	10	1.0	nc	nc	na	na	Yes
TRPH	15,700	85	9	9	1.0	nc	nc	NA [d]	NA	No

Notes:

Table G-11
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 21
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Tundra Data: Maximum Detect (mg/kg)	Soil Tundra Data: Minimum Detect (mg/kg)	Soil Tundra Data: Number of Samples	Soil Tundra Data: Number of Detects	Soil Tundra Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
TRPH - Total Residual Petroleum Hydrocarbons

Table G-12
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)
Inorganics, Total										
Aluminum	0.71	0.11	2	2	1.0	nc	2.2	0.087	0.0087	No
Arsenic	0.0020	0.0020	4	2	0.50	nc	nc	0.15	0.015	Yes
Barium	0.010	0.0050	2	2	1.0	nc	0.034	na	na	Yes
Calcium	14	11	2	2	1.0	nc	nc	NA c	NA	No
Copper	0.020	0.020	4	1	0.25	nc	0.083	0.009	0.0009	No
Iron	6.3	4.2	2	2	1.0	nc	nc	NA c	NA	No
Lead	0.0040	0.0020	4	3	0.75	nc	0.014	0.003	0.00025	No
Magnesium	3.0	2.5	2	2	1.0	nc	nc	NA c	NA	No
Manganese	0.69	0.49	2	2	1.0	nc	0.12	1.1	0.11	Yes
Potassium	2.7	2.4	2	2	1.0	nc	nc	NA c	NA	No
Sodium	38	27	2	2	1.0	nc	nc	NA c	NA	No
Zinc	0.49	0.0090	4	3	0.75	nc	0.90	0.11	0.011	No
Inorganics, Dissolved										
Zinc, Dissolved	0.070	0.070	2	1	0.50	nc	0.093	0.11	0.011	No
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	0.47	0.20	4	3	0.75	nc	nc	na	na	Yes

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids

Table G-12
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 21
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
			Number of		Detection	Fresh Surface	Ephemeral	Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Frequency	Water	Surface Water	(mg/L)	(mg/L)	(Yes/No)

ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.

Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.

Table G-13
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics										
Antimony	34	34	1	1	1.0	nc	nc	0.29	0.029	Yes
Chromium	16	7.7	5	5	1.0	48	50	5.0	0.5	No
Copper	22	22	1	1	1.0	107	44	61	6.1	No
Lead	497	31	9	9	1.0	106	112	50	5.0	Yes
Nickel	13	13	1	1	1.0	59	30	30	3.0	No
Zinc	169	60	5	5	1.0	615	157	120	12	Yes
VOCs										
o-Xylene	0.37	0.15	8	3	0.375	nc	nc	4.162	0.4162	No
SVOCs										
Di-n-butyl phthalate	3.5	3.5	1	1	1.0	nc	nc	na	na	Yes
PAHs										
Acenaphthene	0.086	0.0076	11	4	0.36	nc	nc	20	2.0	No
Anthracene	0.01180	0.00020	11	3	0.27	nc	nc	1.98	0.198	No
Benzo(a)anthracene	0.0200	0.0015	11	3	0.27	nc	nc	1.98	0.198	No
Benzo(a)pyrene	0.35	0.35	11	1	0.09	nc	nc	1.98	0.198	Yes
Benzo(b)fluoranthene	0.42	0.00035	11	4	0.36	nc	nc	1.98	0.198	Yes
Benzo(g,h,i)perylene	0.015	0.00015	11	4	0.36	nc	nc	1.98	0.198	No
Chrysene	0.77	0.00020	11	7	0.64	nc	nc	1.98	0.198	Yes
Dibenzo(a,h)anthracene	0.00032	0.00032	11	1	0.09	nc	nc	1.98	0.198	No
Fluoranthene	0.048	0.00070	11	7	0.64	nc	nc	1.98	0.198	No
Fluorene	0.036	0.00020	11	3	0.27	nc	nc	30	3.0	No
Indeno(1,2,3-cd)pyrene	0.00032	0.00032	11	1	0.09	nc	nc	1.98	0.198	No
Naphthalene	1.2	0.00031	11	8	0.73	nc	nc	1.98	0.198	Yes
Phenanthrene	0.21	0.00022	11	8	0.73	nc	nc	1.98	0.198	Yes
Phenol	0.74	0.74	1	1	1.0	nc	nc	30	3.0	No
Pyrene	0.10	0.00018	11	7	0.64	nc	nc	1.98	0.198	No

Table G-13
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 22
Northeast Cape, St. Lawrence Island, Alaska

	Soil Gravel Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	4,070	284	10	5	0.07	nc	nc	na	na	Yes
Gasoline Range Organics (GRO)	38	24	10	3	0.63	nc	nc	na	na	Yes
Residual Range Organics (RRO)	3,815	5.4	8	7	0.88	nc	nc	na	na	Yes
TRPH	5,920	5,920	1	1	1.0	nc	nc	NA [c]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

c TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-14
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data									
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics															
Beryllium	na	na	na	na	na	1.8	1.8	11	1	0.091	3.8	nc	10	1	Yes
Cadmium	na	na	na	na	na	2.6	2.4	11	2	0.18	1.4	3.1	0.38	0.038	No
Chromium	31	14	6	6	1.0	41	7.3	11	11	1.0	48	50	5	0.5	No
Copper	na	na	na	na	na	34	8.8	11	11	1.0	107	44	61	6.1	No
Lead	42	24	6	6	1.0	100	7.1	11	11	1.0	106	112	50	5	No
Nickel	na	na	na	na	na	25	7.8	11	8	0.73	59	30	30	3	No
Thallium	na	na	na	na	na	0.26	0.26	1	1	1.0	1.6	0.56	1	0.1	No
Zinc	124	49	6	6	1.0	140	12	11	11	1.0	615	157	120	12	No
VOCs															
Acetone	na	na	na	na	na	0.19	0.032	5	3	0.60	nc	nc	36.6	3.66	No
Ethylbenzene	na	na	na	na	na	1.1	1.1	10	1	0.10	nc	nc	52.2	5.22	No
Methylene chloride	na	na	na	na	na	0.16	0.0071	5	4	0.80	nc	nc	21.4	2.14	No
PCBs															
PCB-1254 (Aroclor 1254)	0.20	0.20	9	1	0.11	1.5	0.24	10	3	0.30	nc	nc	0.111	0.0111	Yes
PAHs															
2-Methylnaphthalene	0.031	0.031	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	No
Anthracene	1.9	0.016	8	2	0.25	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Benzo(a)anthracene	4.4	4.4	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Benzo(a)pyrene	2.3	2.3	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Benzo(b)fluoranthene	2.6	2.6	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Benzo(g,h,i)perylene	0.056	0.056	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	No
Benzo(k)fluoranthene	2.7	2.7	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Chrysene	5.5	5.5	8	1	0.13	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Fluoranthene	9.3	0.035	8	2	0.25	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Phenanthrene	4.1	0.016	8	2	0.25	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Pyrene	7.5	0.025	8	2	0.25	na	na	na	na	na	nc	nc	1.98	0.198	Yes
Petroleum Hydrocarbons															
Diesel Range Organics (DRO)	83,000	95	10	10	1.0	92,650	7.9	11	10	0.91	nc	nc	na	na	Yes
DRO_ Aromatic	59	59	2	1	0.50	na	na	na	na	na	nc	nc	na	na	Yes
DRO_Aliphatic	490	50	2	2	1.0	na	na	na	na	na	nc	nc	na	na	Yes
Gasoline Range Organics (GRO)						120	3.7	10	4	0.40	nc	nc	na	na	Yes
Residual Range Organics (RRO)	2,200	1,200	6	6	1.0	na	na	na	na	na	nc	nc	na	na	Yes
RRO_Aromatic	360	230	2	2	1.0	na	na	na	na	na	nc	nc	na	na	Yes
TRPH	110,000	47,000	2	2	1.0	104,000	12	10	10	1.0	nc	nc	NA [c]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

Table G-14
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Soil Tundra Data					Soil Gravel Data							Ecological	COPEC Screening	
	Maximum	Minimum	Number of		Detection	Maximum	Minimum	Number of		Detection	BUTL (mg/kg)		Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Detect (mg/kg)	Detect (mg/kg)	Samples	Detects	Frequency	Soil Tundra	Soil Gravel	(mg/kg)	(mg/kg)	(Yes/No)

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
Soil invertebrate benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. (Table 1)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/kg - Milligrams per kilogram.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-15
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Inorganics									
Chromium	649	4.4	68	67	0.99	34	43.4	4.34	Yes
Copper	20	16	3	3	1.0	40	31.6	3.16	No
Lead	4,590	4.0	68	55	0.81	78	35.8	3.58	Yes
Nickel	13	13	3	1	0.33	126	22.7	2.27	No
Zinc	4,810	12	68	68	1.0	148	121	12.1	Yes
VOCs									
Benzene	0.050	0.050	8	1	0.13	nc	0.057	0.0057	No
Ethylbenzene	1.8	0.027	8	2	0.25	nc	3.6	0.36	Yes
Toluene	0.37	0.0038	8	3	0.38	nc	0.67	0.067	Yes
Xylenes	0.78	0.048	8	3	0.38	nc	0.025	0.0025	Yes
PCBs									
PCB-1242 (Aroclor 1242)	0.12	0.12	79	1	0.013	nc	0.0598	0.00598	Yes
PCB-1254 (Aroclor 1254)	2.8	0.038	79	14	0.18	nc	0.06	0.006	Yes
PCB-1260 (Aroclor 1260)	5.4	0.063	79	27	0.34	nc	0.005	0.0005	Yes
Pesticides									
4,4'-DDD	1.2	0.0072	13	6	0.46	nc	0.00488	0.000488	Yes
beta-BHC	0.012	0.0036	10	2	0.20	nc	0.006	0.0006	Yes
Endosulfan sulfate	0.0086	0.0086	10	1	0.10	nc	na	na	Yes
gamma-BHC (Lindane)	0.0065	0.0029	13	2	0.15	nc	0.00237	0.000237	Yes
Heptachlor	0.0046	0.0044	13	2	0.15	nc	0.00247	0.000247	Yes
Dioxins & Furans									
Dibenzofuran	5.6	0.026	68	26	0.38	nc	2	0.2	Yes
PAHs									
2-Methylnaphthalene	500	0.022	71	58	0.82	nc	0.07	0.007	Yes

Table G-15
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Acenaphthene	14	0.016	70	40	0.57	nc	0.62	0.062	Yes
Acenaphthylene	0.047	0.047	71	1	0.014	nc	0.044	0.0044	Yes
Anthracene	1.8	0.0092	71	7	0.10	nc	0.0572	0.00572	Yes
Benzo(a)anthracene	1.9	0.10	71	5	0.070	nc	0.108	0.0108	Yes
Benzo(a)pyrene	1.4	0.13	71	4	0.056	nc	0.15	0.015	Yes
Benzo(b)fluoranthene	1.6	0.10	71	5	0.070	nc	0.24	0.024	Yes
Benzo(g,h,i)perylene	0.91	0.037	71	2	0.028	nc	0.29	0.029	Yes
Benzo(k)fluoranthene	1.9	0.19	71	4	0.056	nc	0.24	0.024	Yes
Chrysene	2.6	0.031	71	7	0.10	nc	0.166	0.0166	Yes
Dibenzo(a,h)anthracene	0.015	0.015	71	1	0.014	nc	0.033	0.0033	Yes
Fluoranthene	14	0.0084	71	12	0.17	nc	0.423	0.0423	Yes
Fluorene	20	0.011	71	47	0.66	nc	0.0774	0.00774	Yes
Indeno(1,2,3-cd)pyrene	1.2	0.046	71	3	0.042	nc	0.078	0.0078	Yes
Naphthalene	220	0.024	71	55	0.77	nc	0.176	0.0176	Yes
Phenanthrene	21	0.015	71	42	0.59	nc	0.204	0.0204	Yes
Pyrene	9.5	0.010	71	11	0.15	nc	0.195	0.0195	Yes
Petroleum Hydrocarbons									
Diesel Range Organics (DRO)	150,000	22	83	83	1.0	nc	na	na	Yes
DRO_ Aromatic	60	60	3	1	0.33	nc	na	na	Yes
DRO_Aliphatic	150,000	26	5	5	1.0	nc	na	na	Yes
Gasoline Range Organics (GRO)	220	4.0	5	2	0.40	nc	na	na	Yes
Residual Range Organics (RRO)	14,000	69	69	66	0.96	nc	na	na	Yes
RRO_ Aliphatic	11,000	58	5	4	0.80	nc	na	na	Yes
RRO_Aromatic	500	64	5	5	1.0	nc	na	na	Yes
TRPH	127,000	21,500	5	5	1.0	nc	NA [c]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) Consensus-based Freshwater Threshold Effect Concentrations.

Table G-15
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)

MacDonald, D.D., Ingersoll, C.G., Berger, T.A. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. 2000.
Table 2. Sediment quality guidelines for metals in freshwater ecosystems that reflect TECs (I.e., below which) harmful effects are unlikely to be observed).

2) Assessment and Remediation of Contaminated Sediment Program - Threshold Effect Concentration.
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Archives of Environmental Contamination and Toxicology. January.
Table 4. Summary of selected toxicity test - and screening level concentration-based sediment quality benchmarks for freshwater sediments.

3) Ontario Ministry of the Environment: Lowest effect level
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 4. Summary of selected toxicity test - and screening level concentration-based sediment quality benchmarks for freshwater sediments.

4) EPA OSWER Value -
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 5. EPA Region IV and OSWER sediment screening values.

5) NOAA ER-L
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 1. Summary of selected integrative sediment quality benchmarks for marine and estuarine sediments

6) FDEP TEL Value
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 1. Summary of selected integrative sediment quality benchmarks for marine and estuarine sediments

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
mg/kg - Milligrams per kilogram.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons
TRPH - Total Residual Petroleum Hydrocarbons

Table G-16
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L)		Ecological	COPEC Screening	
	Maximum	Maximum	Number of		Detection	Fresh Surface	Ephemeral	Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Water	Surface Water	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Chromium	0.015	0.015	3	1	0.33	nc	nc	0.074	0.0074	Yes
Copper	0.040	0.040	3	1	0.33	nc	0.083	0.009	0.0009	Yes
Lead	0.086	0.086	3	1	0.33	nc	0.014	0.003	0.00025	Yes
Zinc	0.62	0.62	3	1	0.33	nc	0.90	0.11	0.011	Yes
Inorganics, Dissolved										
Lead, Dissolved	0.011	0.011	3	1	0.33	nc	nc	0.003	0.00025	Yes
Zinc, Dissolved	0.23	0.23	3	1	0.33	nc	0.093	0.11	0.011	Yes
VOCs										
Ethylbenzene	0.0016	0.0016	5	1	0.20	nc	nc	3.2	0.32	No
PCBs										
PCB-1260 (Aroclor 1260)	0.0019	0.0015	15	2	0.13	nc	nc	1E-05	0.0000014	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	326	0.39	17	17	1.0	nc	nc	na	na	Yes
Gasoline Range Organics (GRO)	0.57	0.57	5	1	0.20	nc	nc	na	na	Yes
TRPH	19	2.3	5	2	0.40	nc	nc	NA c	NA	No

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
   NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.
5) Lowest Chronic Value observed in freshwater daphnids

Table G-16
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 28
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L)		Ecological	COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)

ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.

Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

NA - Not applicable.
mg/L - Milligrams per liter.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
TRPH - Total Residual Petroleum Hydrocarbons

Table G-17
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Fish Tissue
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg)	Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Fish Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Antimony	0.0070	0.0050	3	3	1.00	nc	na	na	Yes
Arsenic	0.080	0.060	3	3	1.0	nc	na	na	Yes
Barium	1.1	1.0	3	3	1.0	nc	na	na	Yes
Cadmium	0.0080	0.0080	3	3	1.0	nc	na	na	Yes
Copper	1.2	0.64	3	3	1.0	nc	na	na	Yes
Lead	0.028	0.011	3	3	1.0	nc	na	na	Yes
Mercury	0.098	0.076	3	3	1.0	nc	na	na	Yes
Nickel	1.1	0.63	3	3	1.0	nc	na	na	Yes
Selenium	0.16	0.13	3	3	1.0	nc	na	na	Yes
Vanadium	0.11	0.099	3	3	1.0	nc	na	na	Yes
Zinc	51	43	3	3	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.19	0.0053	4	4	1.0	nc	na	na	Yes
Acenaphthene	0.026	0.0063	4	4	1.0	nc	na	na	Yes
Benzo(g,h,i)perylene	0.0043	0.0043	4	1	0.25	nc	na	na	Yes
Fluoranthene	0.0037	0.0015	4	2	0.50	nc	na	na	Yes
Fluorene	0.067	0.011	4	4	1.0	nc	na	na	Yes
Naphthalene	0.068	0.016	4	3	0.75	nc	na	na	Yes
Phenanthrene	0.018	0.0062	4	4	1.0	nc	na	na	Yes
Pyrene	0.0023	0.0018	4	2	0.50	nc	na	na	Yes
PCBs									
PCB-1260 (Aroclor 1260)	0.14	0.060	4	4	1.0	nc	na	na	Yes

Notes:

[a] Regulatory screening criteria for this medium have not been adopted by ADEC.

[b] Ecological Benchmark Criterion is not currently available for this media.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons

Table G-18
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Plant Tissue
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg)	Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Plant Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Antimony	0.0030	0.0030	1	1	1.0	nc	na	na	Yes
Arsenic	2.4	0.060	17	10	0.59	nc	na	na	Yes
Barium	40	0.45	17	17	1.0	nc	na	na	Yes
Cadmium	1.1	0.0020	17	17	1.0	nc	na	na	Yes
Chromium	78	0.12	17	16	0.94	nc	na	na	Yes
Copper	6.9	0.54	17	17	1.0	nc	na	na	Yes
Lead	11	0.065	17	17	1.0	nc	na	na	Yes
Mercury	0.16	0.0030	17	16	0.94	nc	na	na	Yes
Nickel	8.6	0.060	17	17	1.0	nc	na	na	Yes
Selenium	0.99	0.020	17	11	0.65	nc	na	na	Yes
Silver	0.058	0.0070	17	8	0.47	nc	na	na	Yes
Vanadium	7.3	0.016	17	17	1.0	nc	na	na	Yes
Zinc	76	1.3	17	17	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.026	0.0028	17	12	0.71	nc	na	na	Yes
Acenaphthene	0.075	0.0017	17	13	0.76	nc	na	na	Yes
Anthracene	0.050	0.0019	17	11	0.65	nc	na	na	Yes
Benzo(a)anthracene	0.24	0.0028	17	11	0.65	nc	na	na	Yes
Benzo(a)pyrene	0.30	0.0022	17	9	0.53	nc	na	na	Yes
Benzo(b)fluoranthene	0.24	0.0018	17	14	0.82	nc	na	na	Yes
Benzo(g,h,i)perylene	0.15	0.0018	17	10	0.59	nc	na	na	Yes
Benzo(k)fluoranthene	0.34	0.0031	17	11	0.65	nc	na	na	Yes
Chrysene	0.42	0.0020	17	15	0.88	nc	na	na	Yes
Dibenz(a,h)anthracene	0.043	0.0017	17	7	0.41	nc	na	na	Yes
Fluoranthene	1.0	0.0072	17	16	0.94	nc	na	na	Yes
Fluorene	0.077	0.0020	17	16	0.94	nc	na	na	Yes
Indeno(1,2,3-cd)pyrene	0.21	0.0013	17	13	0.76	nc	na	na	Yes
Naphthalene	0.042	0.0027	17	13	0.76	nc	na	na	Yes
Phenanthrene	1.0	0.0027	17	17	1.0	nc	na	na	Yes
Pyrene	0.93	0.0048	17	16	0.94	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	9.3	0.0049	16	16	1.0	nc	na	na	Yes
PCB-1260 (Aroclor 1260)	0.92	0.0049	16	15	0.94	nc	na	na	Yes

Table G-18
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Plant Tissue
Site 28
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Plant Tissue Concentration (mg/kg) Maximum Detect	Plant Tissue Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Plant Tissue	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)

Notes:

[a] Regulatory screening criteria for this medium have not been adopted by ADEC.

[b] Ecological Benchmark Criterion is not currently available for this media.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyls

Table G-19
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Inorganics									
Aluminum	15,900	4,820	4	4	1.0	nc	25,500	2,550	Yes
Arsenic	5.7	2.8	4	4	1.0	nc	9.79	0.979	Yes
Barium	115	40	4	4	1.0	nc	na	na	Yes
Beryllium	1.3	0.20	5	4	0.8	9.8	na	na	Yes
Calcium	3,270	1,580	4	4	1.0	nc	NA [c]	NA	No
Chromium	27	2.6	17	17	1.0	34	43.4	4.34	No
Cobalt	7.0	2.0	4	4	1.0	nc	na	na	Yes
Copper	11	1.8	5	5	1.0	40	31.6	3.16	No
Iron	14,900	8,720	4	4	1.0	nc	NA [c]	NA	No
Lead	24	3.2	17	17	1.0	78	35.8	3.58	No
Magnesium	3,770	2,030	4	4	1.0	nc	NA [c]	NA	No
Manganese	114	80	4	4	1.0	nc	1,673	167.3	Yes
Mercury	0.050	0.050	4	1	0.3	nc	0.18	0.018	Yes
Nickel	14	5.0	5	4	0.8	126	22.7	2.27	No
Potassium	1,360	930	4	4	1.0	nc	NA [c]	NA	No
Sodium	713	416	4	4	1.0	nc	NA [c]	NA	No
Vanadium	35	17	4	4	1.0	nc	na	na	Yes
Zinc	69	14	17	17	1.0	148	121	12.1	No
VOCs									
m,p-Xylene	0.0032	0.0032	4	1	0.25	nc	0.025	0.0025	Yes
Toluene	0.0097	0.0047	9	4	0.44	nc	0.67	0.067	No
Dioxins & Furans									
Dibenzofuran	0.0086	0.0086	16	1	0.063	nc	2	0.2	No
PAHs									
2-Methylnaphthalene	0.23	0.012	21	4	0.19	nc	0.07	0.007	Yes
Acenaphthene	0.014	0.014	21	1	0.048	nc	0.62	0.062	No

Table G-19
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Acenaphthylene	0.010	0.010	21	1	0.048	nc	0.044	0.0044	Yes
Anthracene	0.023	0.023	21	1	0.048	nc	0.0572	0.00572	Yes
Benzo(b)fluoranthene	0.0042	0.0042	21	1	0.048	nc	0.24	0.024	No
Benzo(k)fluoranthene	0.0042	0.0042	21	1	0.048	nc	0.24	0.024	No
Chrysene	0.0048	0.0048	21	1	0.048	nc	0.166	0.0166	No
Fluoranthene	0.022	0.010	21	3	0.14	nc	0.423	0.0423	No
Fluorene	0.022	0.013	21	3	0.14	nc	0.0774	0.00774	Yes
Naphthalene	0.11	0.0098	21	3	0.14	nc	0.176	0.0176	Yes
Phenanthrene	0.037	0.010	21	4	0.19	nc	0.204	0.0204	Yes
Pyrene	0.02	0.011	21	2	0.10	nc	0.195	0.0195	Yes
Petroleum Hydrocarbons									
Diesel Range Organics (DRO)	25,000	9.3	26	24	0.92	nc	na	na	Yes
Residual Range Organics (RRO)	1,000	10	18	17	0.94	nc	na	na	Yes
Residual Range Organics_Aromatic	137	53	6	6	1.0	nc	na	na	Yes
TRPH	67	67	1	1	1.0	nc	NA [d]	NA	No

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) Consensus-based Freshwater Threshold Effect Concentrations.
   MacDonald, D.D., Ingersoll, C.G., Berger, T.A. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. 2000. Archives of Environmental Contamination and Toxicology. January
   Table 2. Sediment quality guidelines for metals in freshwater ecosystems that reflect TECs (I.e., below which) harmful effects are unlikely to be observed).
2) Assessment and Remediation of Contaminated Sediment Program - Threshold Effect Concentration.
   ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
   Table 4. Summary of selected toxicity test - and screening level concentration-based sediment quality benchmarks for freshwater sediments.
3) Ontario Ministry of the Environment: Lowest effect level
   ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
   Table 4. Summary of selected toxicity test - and screening level concentration-based sediment quality benchmarks for freshwater sediments.
4) EPA OSWER Value -
   ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
   Table 5. EPA Region IV and OSWER sediment screening values.

Table G-19
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Freshwater Sediment
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Sediment Concentration (mg/kg) Maximum Detect	Sediment Concentration (mg/kg) Minimum Result	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg) Sediment	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)

5) NOAA ER-L
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 1. Summary of selected integrative sediment quality benchmarks for marine and estuarine sediments

6) FDEP TEL Value
ORNL, 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment - Associated Biota: 1997 Revision. November.
Table 1. Summary of selected integrative sediment quality benchmarks for marine and estuarine sediments

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

[d] TRPH is excluded as a COPEC due to outdated analysis methods.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of Potential Ecological Concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
PAH - Polynuclear Aromatic Hydrocarbons
VOC - Volatile Organic Compounds
TRPH - Total Residual Petroleum Hydrocarbons

Table G-20
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 29
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L)		Ecological		COPEC Screening	
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Number of Samples	Number of Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)		Benchmark[b] (mg/L)	COPEC? (Yes/No)
Inorganics, Total											
Aluminum	0.040	0.040	4	4	1.0	nc	2.2	0.087		0.0087	Yes
Barium	0.0050	0.0050	4	4	1.0	nc	0.034	na		na	Yes
Calcium	7.6	6.9	4	4	1.0	nc	nc	NA	c	NA	No
Iron	0.38	0.31	4	4	1.0	nc	nc	NA		NA	No
Magnesium	2.6	2.0	4	4	1.0	nc	nc	NA	c	NA	No
Manganese	0.027	0.017	4	4	1.0	nc	0.12	1.1		0.11	No
Potassium	1.0	0.68	4	3	0.75	nc	nc	NA	c	NA	No
Sodium	29	14	4	4	1.0	nc	nc	NA	c	NA	No
Zinc	0.0080	0.0080	5	1	0.20	nc	0.90	0.11		0.011	No
Inorganics, Dissolved											
Silver, Dissolved	0.020	0.020	1	1	1.0	nc	nc	0.00012		0.000012	Yes
Petroleum Hydrocarbons											
Diesel Range Organics (DRO)	0.33	0.33	13	1	0.077	nc	nc	na		na	Yes
DRO_Aliphatic	0.33	0.33	1	1	1.0	nc	nc	na		na	Yes
Gasoline Range Organics (GRO)	0.41	0.33	11	2	0.18	nc	nc	na		na	Yes

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids
ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.

Table G-20
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Site 29
Northeast Cape, St. Lawrence Island, Alaska

	Fresh Surface Water Data					BUTL (mg/L)		Ecological	COPEC Screening	
			Number of							
Constituent	Maximum Detect (mg/L)	Maximum Detect (mg/L)	Samples	Detects	Detection Frequency	Fresh Surface Water	Ephemeral Surface Water	Benchmark[a] (mg/L)	Benchmark[b] (mg/L)	COPEC? (Yes/No)

Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of Potential Ecological Concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.

Table G-21
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Fish Tissue
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg)	Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Fish Tissue	(mg/kg)	(mg/kg)	(Yes/No)
Inorganics									
Antimony	0.01	0.01	15	1	0.07	nc	na	na	Yes
Arsenic	0.78	0.21	15	15	1.0	nc	na	na	Yes
Barium	0.466	0.015	15	15	1.0	nc	na	na	Yes
Cadmium	0.044	0.0060	15	11	0.73	nc	na	na	Yes
Copper	3.01	0.55	15	15	1.0	nc	na	na	Yes
Lead	0.012	0.0030	15	10	0.67	nc	na	na	Yes
Mercury	0.022	0.0040	15	15	1.0	nc	na	na	Yes
Nickel	1.1	0.030	15	7	0.47	nc	na	na	Yes
Selenium	0.52	0.12	15	15	1.0	nc	na	na	Yes
Silver	0.036	0.011	15	5	0.33	nc	na	na	Yes
Vanadium	0.142	0.017	15	15	1.0	nc	na	na	Yes
Zinc	36.9	5.6	15	15	1.0	nc	na	na	Yes
PAHs									
2-Methylnaphthalene	0.0090	0.0026	16	4	0.25	nc	na	na	Yes
Acenaphthene	0.0092	0.0013	16	5	0.31	nc	na	na	Yes
Anthracene	0.011	0.0017	15	5	0.33	nc	na	na	Yes
Benzo(a)anthracene	0.012	0.0014	16	6	0.38	nc	na	na	Yes
Benzo(a)pyrene	0.0090	0.0021	16	4	0.25	nc	na	na	Yes
Benzo(b)fluoranthene	0.0073	0.0012	16	6	0.38	nc	na	na	Yes
Benzo(g,h,i)perylene	0.0089	0.0025	16	6	0.38	nc	na	na	Yes
Benzo(k)fluoranthene	0.018	0.0024	16	6	0.38	nc	na	na	Yes
Chrysene	0.012	0.0019	16	6	0.38	nc	na	na	Yes
Dibenz(a,h)anthracene	0.0068	0.0016	15	3	0.20	nc	na	na	Yes
Fluoranthene	0.013	0.0017	16	6	0.38	nc	na	na	Yes
Fluorene	0.011	0.0012	15	6	0.40	nc	na	na	Yes
Indeno(1,2,3-cd)pyrene	0.0043	0.00074	16	7	0.44	nc	na	na	Yes
Naphthalene	0.0066	0.0018	16	7	0.44	nc	na	na	Yes
Phenanthrene	0.012	0.0014	15	9	0.60	nc	na	na	Yes
Pyrene	0.014	0.0026	16	7	0.44	nc	na	na	Yes
PCBs									
PCB-1254 (Aroclor 1254)	0.030	0.0061	16	15	0.94	nc	na	na	Yes
PCB-1260 (Aroclor 1260)	0.16	0.0041	16	3	0.19	nc	na	na	Yes

Notes:

[a] Regulaory screening criteria for this medium have not been adopted by ADEC.

[b] Ecological Benchmark Criterion is not currently available for this media.

NA - Not applicable.

Table G-21
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Fish Tissue
Site 29
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Fish Tissue Concentration (mg/kg)		Number of		Detection	BUTL (mg/kg)	Ecological Benchmark[a]	COPEC Screening Benchmark[b]	COPEC?
	Maximum Detect	Minimum Result	Samples	Detects	Frequency	Fish Tissue	(mg/kg)	(mg/kg)	(Yes/No)

BUTL - Background upper tolerance limit.
COPEC - Chemical of Potential Ecological Concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
PCB - Polychlorinated Biphenyls
PAH - Polynuclear Aromatic Hydrocarbons

Table G-22
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 31
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Tundra Data: Maximum Detect (mg/kg)	Soil Tundra Data: Minimum Detect (mg/kg)	Soil Tundra Data: Number of Samples	Soil Tundra Data: Number of Detects	Soil Tundra Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
VOCs										
m,p-Xylene	0.017	0.0066	4	2	0.50	nc	nc	4.162	0.4162	No
o-Xylene	0.0053	0.0053	4	1	0.25	nc	nc	4.162	0.4162	No
Toluene	0.024	0.0073	4	3	0.75	nc	nc	200	20	No
PCBs										
PCB-1260 (Aroclor 1260)	22	0.36	8	6	0.75	nc	nc	0.111	0.0111	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	11,000	11	24	24	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	9,600	12	24	12	0.50	nc	nc	na	na	Yes

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
PCB - Polychlorinated Biphenyls
VOC - Volatile Organic Compounds

Table G-23
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Surface Water
Location Site 31
Northeast Cape, St. Lawrence Island, Alaska

	Ephemeral Surface Water Concentration					BUTL (mg/L)		Ecological	COPEC Screening	
	Maximum	Maximum	Number of		Detection	Fresh Surface	Ephemeral	Benchmark[a]	Benchmark[b]	COPEC?
Constituent	Detect (mg/L)	Detect (mg/L)	Samples	Detects	Frequency	Water	Surface Water	(mg/L)	(mg/L)	(Yes/No)
Inorganics, Total										
Aluminum	0.050	0.050	2	1	0.50	nc	2.2	0.087	0.0087	No
Barium	0.0030	0.0030	2	1	0.50	nc	0.034	na	na	Yes
Calcium	2.2	2.1	2	2	1.0	nc	nc	NA c	NA	No
Iron	0.030	0.030	2	1	0.5	nc	nc	NA c	NA	No
Magnesium	0.85	0.80	2	2	1.0	nc	nc	NA c	NA	No
Manganese	0.0050	0.0010	2	2	1.0	nc	0.12	1.1	0.11	Yes
Sodium	4.2	4.1	2	2	1.0	nc	nc	NA c	NA	No

Notes:

[a] Please refer to Technical Memorandum-Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape, St. Lawrence Island, Alaska (MWH, 2003).

[b] Ecological Benchmark Criterion selected based on the following hierarchy:

1) USEPA National Ambient Water Quality Criteria - Freshwater Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

2) USEPA National Ambient Water Quality Criteria - Marine Chronic Value
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

3) USEPA National Ambient Water Quality Criteria - Freshwater Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

4) USEPA National Ambient Water Quality Criteria - Marine Acute Value divided by 10
NOAA, 1999. Screening Quick Reference Tables (SQuiRT). September.

5) Lowest Chronic Value observed in freshwater daphnids
ORNL, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. November.
Table 1. Summary of conventional benchmarks for priority contaminants in fresh water.

[c] Soil Screening Criteria are not available for this essential nutrient. This analyte is excluded as a COPEC based on essential nutrient status.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/L - Milligrams per liter.
na - Not available.
PCB - Polychlorinated Biphenyls
VOC - Volatile Organic Compounds

Table G-24
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 32
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Gravel Data: Maximum Detect (mg/kg)	Soil Gravel Data: Minimum Detect (mg/kg)	Soil Gravel Data: Number of Samples	Soil Gravel Data: Number of Detects	Soil Gravel Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
PCBs										
PCB-1260 (Aroclor 1260)	0.89	0.16	3	2	0.67	na	na	0.111	0.0111	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	13,000	230	5	5	1.0	na	na	na	na	Yes
Residual Range Organics (RRO)	3,600	1,100	5	3	0.60	na	na	na	na	Yes

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:
1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).
2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)
3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

NA - Not applicable.
BUTL - Background upper tolerance limit.
mg/kg - Milligram per kilogram.
na - Not available.
nc - Not calculated.
PCB - Polychlorinated Biphenyls
COPEC - Chemical of Potential Ecological Concern.

Table G-25
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 33
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Gravel Data: Maximum Detect (mg/kg)	Soil Gravel Data: Minimum Detect (mg/kg)	Soil Gravel Data: Number of Samples	Soil Gravel Data: Number of Detects	Soil Gravel Data: Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	660	150	3	3	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	2,100	270	3	3	1.0	nc	nc	na	na	Yes

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

NA - Not applicable.
BUTL - Background upper tolerance limit.
COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.

Table G-26
Selection of Chemicals of Potential Ecological Concern for Tier I Screening - Soil
Site 34
Northeast Cape, St. Lawrence Island, Alaska

Constituent	Soil Gravel Data: Maximum Detect (mg/kg)	Minimum Detect (mg/kg)	Number of Samples	Number of Detects	Detection Frequency	BUTL (mg/kg): Soil Tundra	BUTL (mg/kg): Soil Gravel	Ecological Benchmark[a] (mg/kg)	COPEC Screening Benchmark[b] (mg/kg)	COPEC? (Yes/No)
PCBs										
PCB-1254 (Aroclor 1254)	0.59	0.050	8	5	0.63	nc	nc	0.111	0.0111	Yes
PCB-1260 (Aroclor 1260)	0.47	0.063	8	4	0.50	nc	nc	0.111	0.0111	Yes
Petroleum Hydrocarbons										
Diesel Range Organics (DRO)	1,100	13	9	9	1.0	nc	nc	na	na	Yes
Residual Range Organics (RRO)	1,200	58	9	8	0.89	nc	nc	na	na	Yes

Notes:

[a] Ecological Benchmark Criterion selected based on the following hierarchy:

1) ECO-SSLs
Ecological Soil Screening Level Guidance - Draft. Office of Emergency and Remedial Response. July 10. (EPA, 2000).

2) The lower of ORNL plant or soil invertebrate benchmarks.
Plant benchmarks derived from ORNL (1997), Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. (Table 1)

3) The lower of ORNL mammalian or avian dietary wildlife benchmarks, assuming diet consists of 100% soil.
Toxicological Benchmarks for Wildlife: 1996 Revision. June. (ORNL, 1996). (Appendix D Table 12-NOAEL-Based Benchmark for Food.)

[b] Ecological risk-based screening criteria (ERBSC) is equal to one-tenth the ecological benchmark criterion.

COPEC - Chemical of potential ecological concern.
mg/kg - Milligrams per kilogram.
na - Not available.
nc - Not calculated.
PCB - Polychlorinated Biphenyls

APPENDIX H

Ecological Hazard Calculations

TABLE H-1

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
SITE 3 - Fuel Line Corridor and Pumphouse
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Lead	119	0	0.64	6.8E-01	1.3E+01	0.053
Xylenes	0	0.54	0	7.2E-08	8.0E+02	0.000000000089
Anthracene	10.3	0	0.13	7.3E-02	8.7E+01	0.00084
Naphthalene	50.8	0	2.7	7.6E-01	8.0E+01	0.0094
PCB-1260 (Aroclor 1260)	0.75	0	0.00090	3.7E-03	2.9E-01	0.013
Diesel Range Organics	2,587	14	135	na	na	na
Diesel Range Organics, Aliphatic	2,070	11	108	3.1E+01	8.0E+01	0.38
Diesel Range Organics, Aromatic	1,035	0	54	1.5E+01	8.0E+01	0.19
Residual Range Organics	0	8.1	0	na	na	na
Residual Range Organics, Aliphatic	0	7.3	0	9.69E-07	8.69E+01	0.000000011
Residual Range Organics, Aromatic	0	2.4	0	3.23E-07	8.69E+01	0.0000000037
					Max HQ	**0.38**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-2

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
SITE 3 - Fuel Line Corridor and Pumphouse
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Lead	119	0	0.64	0.036	3.1E-04	7.4E-01	0.00042
Xylenes	0	0.54	0	0	8.1E-11	4.6E+01	0.0000000000017
Anthracene	10.3	0	0.13	0.0000027	2.8E-05	5.0E+00	0.0000055
Naphthalene	50.8	0	2.7	0.0000024	1.5E-04	4.6E+00	0.000033
PCB-1260 (Aroclor 1260)	0.75	0	0.00090	0.0000079	1.9E-06	1.7E-02	0.00011
Diesel Range Organics	2,587	14	135	0.00012	na	na	na
Diesel Range Organics, Aliphatic	2,070	11	108	0.000096	6.3E-03	4.6E+00	0.0014
Diesel Range Organics, Aromatic	1,035	0	54	0.000048	3.2E-03	4.6E+00	0.00068
Residual Range Organics	0	8.1	0	0	na	na	na
Residual Range Organics, Aliphatic	0	7.3	0	0	1.09E-09	5.01E+00	0.00000000022
Residual Range Organics, Aromatic	0	2.4	0	0	3.63E-10	5.01E+00	0.000000000072
						Max HQ	**0.0014**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-3

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
SITE 3 - Fuel Line Corridor and Pumphouse
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Lead	119	0	0	0.64	0	2.3E-08	2.1E+00	0.000000011
Xylenes	0	0	0.54	0	0	3.5E-13	na	na
Anthracene	10.3	0	0	0.13	0	4.6E-09	5.4E-01	0.0000000084
Naphthalene	50.8	0	0	2.7	0	9.4E-08	4.3E-01	0.00000022
PCB-1260 (Aroclor 1260)	0.75	0	0	0.00090	0	3.2E-11	2.0E-01	0.00000000016
Diesel Range Organics	2,587	0	14	135	0	na	na	na
Diesel Range Organics, Aliphatic	2,070	0	11	108	0	3.8E-06	4.3E-01	0.0000090
Diesel Range Organics, Aromatic	1,035	0	0	54	0	1.9E-06	4.3E-01	0.0000045
Residual Range Organics	0	0	8.1	0	0	na	na	na
Residual Range Organics, Aliphatic	0	0	7.3	0	0	4.73E-12	5.41E-01	0.0000000000087
Residual Range Organics, Aromatic	0	0	2.4	0	0	1.58E-12	5.41E-01	0.0000000000029
							Max HQ	**0.0000090**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-4

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
SITE 4 - Subsistence Fishing and Hunting Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Xylenes	0	0.0069	0	9.2E-10	8.0E+02	0.0000000000011
Anthracene	14	0	0.17	9.8E-02	8.7E+01	0.0011
Chrysene	11	0	0.025	5.8E-02	8.7E+01	0.00066
Fluorene	13	0	0.23	1.1E-01	8.7E+01	0.0012
Diesel Range Organics	5,300	3.7	277	na	na	na
Diesel Range Organics, Aliphatic	4,240	3.0	221	6.3E+01	8.0E+01	0.79
Diesel Range Organics, Aromatic	2,120	0	111	3.2E+01	8.0E+01	0.39
Residual Range Organics	3,420	6.5	4.5	na	na	na
Residual Range Organics, Aliphatic	3,078	5.9	4.1	1.53E+01	8.69E+01	0.18
Residual Range Organics, Aromatic	1,026	2.0	1.4	5.09E+00	8.69E+01	0.059
					Max HQ	**0.79**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-5

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
SITE 4 - Subsistence Fishing and Hunting Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Xylenes	0	0.0069	0	0	2.9E-12	4.6E+01	0.000000000000063
Anthracene	14	0	0.17	0.0000036	1.0E-04	5.0E+00	0.000021
Chrysene	11	0	0.025	0.000042	8.2E-05	5.0E+00	0.000016
Fluorene	13	0	0.23	0.0000020	9.9E-05	5.0E+00	0.000020
Diesel Range Organics	5,300	3.7	277	0.00025	na	na	na
Diesel Range Organics, Aliphatic	4,240	3.0	221	0.00020	3.7E-02	4.6E+00	0.0079
Diesel Range Organics, Aromatic	2,120	0	111	0.000098	1.8E-02	4.6E+00	0.0039
Residual Range Organics	3,420	6.5	4.5	0	na	na	na
Residual Range Organics, Aliphatic	3,078	5.9	4.1	0	2.25E-02	5.01E+00	0.0045
Residual Range Organics, Aromatic	1,026	2.0	1.4	0	7.49E-03	5.01E+00	0.0015
						Max HQ	**0.0079**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-6

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
SITE 4 - Subsistence Fishing and Hunting Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Xylenes	0	0	0.0069	0	0	1.3E-14	na	na
Anthracene	14	0	0	0.17	0	1.7E-08	5.4E-01	0.000000032
Chrysene	11	0	0	0.025	0	2.5E-09	5.4E-01	0.0000000047
Fluorene	13	0	0	0.23	0	2.3E-08	5.4E-01	0.000000043
Diesel Range Organics	5,300	0	3.7	277	0	na	na	na
Diesel Range Organics, Aliphatic	4,240	0	3.0	221	0	2.2E-05	4.3E-01	0.000052
Diesel Range Organics, Aromatic	2,120	0	0	111	0	1.1E-05	4.3E-01	0.000026
Residual Range Organics	3,420	0	6.5	4.5	0	na	na	na
Residual Range Organics, Aliphatic	3,078	0	5.9	4.1	0	4.12E-07	5.41E-01	0.00000076
Residual Range Organics, Aromatic	1,026	0	2.0	1.4	0	1.37E-07	5.41E-01	0.00000025
							Max HQ	**0.000052**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-7

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Sites 3 & 4 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Lead	119	0	0.64	6.8E-01	1.3E+01	0.053
Xylenes	0	0.54	0	7.2E-08	8.0E+02	0.000000000089
Anthracene	14	0	0.17	1.0E-01	8.7E+01	0.0011
Chrysene	11	0	0	5.6E-02	8.7E+01	0.00065
Fluorene	13	0	0	1.1E-01	8.7E+01	0.0012
Naphthalene	50.8	0	2.7	7.6E-01	8.0E+01	0.0094
PCB-1260 (Aroclor 1260)	0.75	0	0.00090	3.7E-03	2.9E-01	0.013
Diesel Range Organics	5,300	14	277	na	na	na
Diesel Range Organics, Aliphatic	4,240	11	221	6.3E+01	8.0E+01	0.79
Diesel Range Organics, Aromatic	2,120	0	111	3.2E+01	8.0E+01	0.39
Residual Range Organics	3,420	8.1	4.5	na	na	na
Residual Range Organics, Aliphatic	3,078	7.3	4.1	1.53E+01	8.69E+01	0.18
Residual Range Organics, Aromatic	1,026	2.4	1.4	5.09E+00	8.69E+01	0.059
					Max HQ	**0.79**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-8

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Sites 3 & 4 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Lead	119	0	0.64	0.036	1.2E-03	7.4E-01	0.0016
Xylenes	0	0.54	0	0	3.1E-10	4.6E+01	0.0000000000067
Anthracene	14	0	0.17	0.0000037	1.4E-04	5.0E+00	0.000029
Naphthalene	50.8	0	2.7	0.0000024	5.9E-04	4.6E+00	0.00013
PCB-1260 (Aroclor 1260)	0.75	0	0.00090	0.0000079	7.4E-06	1.7E-02	0.00044
Diesel Range Organics	5,300	14	277	0.00025	na	na	na
Diesel Range Organics, Aliphatic	4,240	11	221	0.000197	4.9E-02	4.6E+00	0.011
Diesel Range Organics, Aromatic	2,120	0	111	0.000098	2.5E-02	4.6E+00	0.0053
Residual Range Organics	3,420	8.1	4.5	0	na	na	na
Residual Range Organics, Aliphatic	3,078	7.3	4.1	0	3.04E-02	5.01E+00	0.0061
Residual Range Organics, Aromatic	1,026	2.4	1.4	0	1.01E-02	5.01E+00	0.0020
						Max HQ	**0.011**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-9

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Sites 3 & 4 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Lead	119	0	0	0.64	0	8.8E-08	2.1E+00	0.000000041
Xylenes	0	0	0.54	0	0	1.3E-12	na	na
Anthracene	14	0	0	0.17	0	2.4E-08	5.4E-01	0.000000044
Naphthalene	51	0	0	2.7	0	3.6E-07	4.3E-01	0.00000085
PCB-1260 (Aroclor 1260)	0.75	0	0	0.00090	0	1.2E-10	2.0E-01	0.00000000061
Diesel Range Organics	5,300	0	14	277	0	na	na	na
Diesel Range Organics, Aliphatic	4,240	0	11	221	0	3.0E-05	4.3E-01	0.000071
Diesel Range Organics, Aromatic	2,120	0	0	111	0	1.5E-05	4.3E-01	0.000035
Residual Range Organics	3,420	0	8.1	4.5	0	na	na	na
Residual Range Organics, Aliphatic	3,078	0	7.3	4.1	0	5.58E-07	5.41E-01	0.0000010
Residual Range Organics, Aromatic	1,026	0	2.4	1.4	0	1.86E-07	5.41E-01	0.00000034
							Max HQ	**0.000071**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-10

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
SITE 6 - Cargo Beach Road Drum Field
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Aluminum	9,850	0	4.7	4.7E+01	3.1E+00	15
Manganese	164	0	4.9	1.7E+00	1.4E+02	0.012
Zinc	106	0	0.0000000000153	5.0E-01	9.0E+00	0.055
Diesel Range Organics	102,000	1.8	5,324	na	na	na
Diesel Range Organics, Aliphatic	81,600	1.4	4,259	1.2E+03	8.0E+01	15
Diesel Range Organics, Aromatic	40,800	0.58	2,130	6.1E+02	8.0E+01	7.6
Residual Range Organics	8,500	0	11	na	na	na
Residual Range Organics, Aliphatic	7,650	0	10	3.79E+01	8.69E+01	0.44
Residual Range Organics, Aromatic	2,550	0	3.4	1.26E+01	8.69E+01	0.15
					Max HQ	**15**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-11

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
SITE 6 - Cargo Beach Road Drum Field
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	9,850	0	4.7	15	3.5E-02	1.8E-01	0.20
Manganese	164	0	4.9	0.07	6.2E-04	8.2E+00	0.000076
Zinc	106	0	0.000000000015	10.60	1.5E-03	5.2E-01	0.0029
Diesel Range Organics	102,000	1.8	5,324	0.00	na	na	na
Diesel Range Organics, Aliphatic	81,600	1.4	4,259	0.00	3.3E-01	4.6E+00	0.071
Diesel Range Organics, Aromatic	40,800	0.58	2,130	0.00	1.6E-01	4.6E+00	0.035
Residual Range Organics	8,500	0	11	0.08	na	na	na
Residual Range Organics, Aliphatic	7,650	0	10	0.07	2.60E-02	5.01E+00	0.0052
Residual Range Organics, Aromatic	2,550	0	3.4	0.02	8.67E-03	5.01E+00	0.0017
						Max HQ	**0.20**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-12

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
SITE 6 - Cargo Beach Road Drum Field
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	9,850	0	0	4.7	0	2.2E-07	5.8E+01	0.0000000039
Manganese	164	0	0	4.9	0	2.3E-07	5.7E+02	0.00000000041
Zinc	106	0	0	0.000000000015	0	7.2E-19	1.4E+02	5.1E-21
Diesel Range Organics	102,000	0	1.8	5,324	0	na	na	na
Diesel Range Organics, Aliphatic	81,600	0	1.4	4,259	0	2.0E-04	4.3E-01	0.00047
Diesel Range Organics, Aromatic	40,800	0	0.58	2,130	0	1.0E-04	4.3E-01	0.00023
Residual Range Organics	8,500	0	0	11	0	na	na	na
Residual Range Organics, Aliphatic	7,650	0	0	10	0	4.77E-07	5.41E-01	0.00000088
Residual Range Organics, Aromatic	2,550	0	0	3.4	0	1.59E-07	5.41E-01	0.00000029
							Max HQ	**0.00047**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-13

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Arsenic	15	0.017	0.063	8.1E-02	4.9E+00	0.016
Barium	0	0.012	0	1.6E-09	8.2E-01	0.0000000019
Cadmium	3.4	0	0.15	4.5E-02	1.6E+00	0.028
Chromium	43	0.016	0	2.0E-01	5.6E+00	0.036
Copper	8.3	0	0.40	1.2E-01	2.5E+01	0.0047
Lead	196	0.065	1.1	1.1E+00	1.3E+01	0.088
Mercury	0.31	0	0	1.5E-03	2.1E+00	0.00070
Mercury, Dissolved	0	0.00038	0	5.1E-11	2.1E+00	0.000000000024
Nickel	50	0.041	0.19	2.7E-01	8.0E+01	0.0034
Silver, Dissolved	2.0	0	0.096	2.8E-02	3.3E-01	0.086
Thallium	0	0.0024	0.00000	3.2E-10	2.1E-02	0.000000015
Thallium, Dissolved	0	0.0012	0	1.6E-10	2.1E-02	0.0000000076
Bromomethane	0.18	0	0.19	3.8E-02	4.3E+01	0.00087
4-Methylphenol (p-Cresol)	3.9	0	1.4	2.9E-01	4.6E+02	0.00062
PCB-1260 (Aroclor 1260)	1.6	0	0.0019	7.9E-03	2.9E-01	0.027
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0	0.00000041	2.5E-06	1.6E-02	0.00016
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0.0000052	0.000013	9.7E-05	1.6E-03	0.060
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0	0.00000013	7.8E-07	1.6E-04	0.0048
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0.00000071	0.00000074	5.3E-06	1.6E-04	0.033
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0.000000016	9.7E-08	1.6E-05	0.0060
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0.0000000084	5.2E-08	1.6E-05	0.0033
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0.000000020	1.4E-07	1.6E-05	0.0090
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000012	0	0.00000000081	5.8E-09	1.6E-05	0.00036
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0.0000000070	4.3E-08	1.6E-05	0.0027
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0.0000000094	5.8E-08	3.2E-06	0.018

TABLE H-13

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0.000000023	1.4E-07	1.6E-06	0.088
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0.0000014	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	na	na	na	na
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	na	na	na	na
Diesel Range Organics	32,000	12	1,670	na	na	na
Diesel Range Organics, Aliphatic	25,600	9.6	1,336	3.8E+02	8.0E+01	4.8
Diesel Range Organics, Aromatic	12,800	4.8	668	1.9E+02	8.0E+01	2.4
Residual Range Organics	3,448	0	4.6	na	na	na
Residual Range Organics, Aliphatic	3,103	0	4.1	1.5E+01	8.69E+01	0.18
Residual Range Organics, Aromatic	1,034	0	1.4	5.1E+00	8.69E+01	0.059
					Max HQ	**4.8**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-14

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Arsenic	15	0.017	0.063	0.03	3.7E-04	2.8E-01	0.0013
Barium	0	0.012	0	0.00	1.6E-11	4.7E-02	0.00000000034
Cadmium	3.4	0	0.15	0.00	9.4E-05	9.3E-02	0.0010
Chromium	43	0.016	0	0.24	1.2E-03	3.2E-01	0.0036
Copper	8.3	0	0	0.087	2.9E-04	1.4E+00	0.00020
Lead	196	0.065	1.1	0.059	4.7E-03	7.4E-01	0.0063
Mercury	0.3	0	0	0.078	6.6E-05	1.2E-01	0.00054
Mercury, Dissolved	0	0.00038	0	0.00	5.1E-13	1.2E-01	0.0000000000043
Nickel	50	0.041	0.19	0.30	1.4E-03	4.6E+00	0.000304
Silver, Dissolved	2.0	0	0.10	0.006	5.9E-05	1.9E-02	0.0032
Thallium	0	0.0024	0.00000	0.00	3.2E-12	1.2E-03	0.0000000027
Thallium, Dissolved	0	0.001	0	0.00	1.6E-12	1.2E-03	0.0000000013
Bromomethane	0.18	0	0.19	0.00	2.0E-05	2.5E+00	0.0000080
4-Methylphenol (p-Cresol)	3.9	0	1.4	0.00	2.0E-04	2.7E+01	0.0000077
PCB-1260 (Aroclor 1260)	1.6	0	0.0019	0.00	3.7E-05	1.7E-02	0.0022
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.0	0	0	0.00	1.2E-08	9.3E-04	0.000013
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0.0000052	0.000013	0.00	4.7E-07	9.3E-05	0.0050
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0002	0	0.000000	0.00	3.7E-09	9.3E-06	0.0004
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0.00000071	0.00000074	0.00	2.6E-08	9.3E-06	0.0028
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0.000000016	0.00	4.7E-10	9.3E-07	0.00050
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0.0000000084	0.00	2.5E-10	9.3E-07	0.00027
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0.000000020	0.00	7.0E-10	9.3E-07	0.00076
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000012	0	0.00000000081	0.00	2.8E-11	9.3E-07	0.000030
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0.0000000070	0.00	2.1E-10	9.3E-07	0.00022
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0.0000000094	0.00	2.8E-10	1.9E-07	0.0015
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0.000000023	0.00	6.8E-10	9.3E-08	0.0073
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	na	na	na	na	na

TABLE H-14

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0.0000014	na	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	na	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	na	na	na	na	na
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	na	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	na	na	na	na	na
Diesel Range Organics	32,000	12	1,670	0.00	na	na	na
Diesel Range Organics, Aliphatic	25,600	9.6	1,336	0.00	7.1E-01	4.6E+00	0.15
Diesel Range Organics, Aromatic	12,800	4.8	668	0.00	3.5E-01	4.6E+00	0.076
Residual Range Organics	3,448	0	4.6	0.030	na	na	na
Residual Range Organics, Aliphatic	3,103	0	4.1	0.027	7.27E-02	5.01E+00	0.014
Residual Range Organics, Aromatic	1,034	0	1.4	0.009	2.42E-02	5.01E+00	0.0048
						Max HQ	**0.15**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-15

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Arsenic	15	0	0.017	0.06	0	2.0E-08	1.1E+00	0.000000019
Barium	0	0	0.012	0	0	7.1E-14	1.1E+01	0.0000000000000063
Cadmium	3.4	0	0	0.15	0	4.8E-08	1.3E+00	0.000000036
Chromium	43	0	0.016	0	0	9.3E-14	9.7E-01	0.00000000000010
Copper	8.3	0	0	0.40	0	1.3E-07	2.5E+01	0.0000000051
Lead	196	0	0.065	1.1	0	3.4E-07	2.1E+00	0.00000016
Mercury	0.31	0	0	0.0	0	0.0E+00	2.6E-01	0
Mercury, Dissolved	0	0	0.00038	0	0	2.2E-15	2.6E-01	0.0000000000000087
Nickel	50	0	0.041	0.19	0	6.2E-08	7.1E+01	0.00000000087
Silver, Dissolved	2.0	0	0	0.10	0	3.1E-08	1.6E+02	0.00000000019
Thallium	0	0	0.0024	0	0	1.4E-14	1.7E-01	0.000000000000083
Thallium, Dissolved	0	0	0.0012	0	0	7.1E-15	1.7E-01	0.000000000000042
Bromomethane	0.18	0	0	0.19	0	6.1E-08	na	na
4-Methylphenol (p-Cresol)	3.9	0	0	1.4	0	4.4E-07	na	na
PCB-1260 (Aroclor 1260)	1.6	0	0	0.0019	0	6.2E-10	2.0E-01	0.0000000031
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0	0	0.00000041	0	1.3E-13	1.1E-01	0.0000000000012
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0	0.0000052	0.000013	0	4.4E-12	1.1E-01	0.000000000041
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0	0	0.00000013	0	4.0E-14	1.1E-03	0.00000000004
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0	0.00000071	0.00000074	0	2.4E-13	1.1E-02	0.000000000022
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0	0.000000016	0	5.0E-15	1.1E-04	0.000000000047
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0	0.0000000084	0	2.7E-15	1.1E-04	0.000000000025
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0	0.000000020	0	6.5E-15	1.1E-03	0.0000000000061
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000012	0	0	0.00000000081	0	2.6E-16	1.1E-04	0.0000000000024
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0	0.0000000070	0	2.2E-15	1.1E-04	0.000000000021
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0	0.0000000094	0	3.0E-15	1.1E-05	0.00000000028
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0	0.000000023	0	7.3E-15	1.1E-05	0.00000000068
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	0	na	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0	0.0000014	na	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	0	na	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	0	na	na	na	na	na
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	0	na	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	0	na	na	na	na	na

TABLE H-15

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 7 - Cargo Beach Road Landfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Diesel Range Organics	32,000	0	12	1,670	0	na	na	na
Diesel Range Organics, Aliphatic	25,600	0	9.6	1,336	0	4.3E-04	4.3E-01	0.0010
Diesel Range Organics, Aromatic	12,800	0	4.8	668	0	2.2E-04	4.3E-01	0.00050
Residual Range Organics	3,448	0	0	4.6	0	na	na	na
Residual Range Organics, Aliphatic	3,103	0	0	4.1	0	1.33E-06	5.41E-01	0.0000025
Residual Range Organics, Aromatic	1,034	0	0	1.4	0	4.44E-07	5.41E-01	0.00000082
							Max HQ	**0.0010**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-16

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Aluminum	9,850	0	4.7	4.7E+01	3.1E+00	15
Arsenic	15	0.017	0.063	8.1E-02	4.9E+00	0.016
Barium	0	0.012	0	1.6E-09	8.2E-01	0.0000000019
Cadmium	3.4	0	0.15	4.5E-02	1.6E+00	0.028
Chromium	43	0.016	0	2.0E-01	5.6E+00	0.036
Lead	196	0.065	1.1	1.1E+00	1.3E+01	0.088
Manganese	164	0	5	1.7E+00	1.4E+02	0.012
Mercury	0.31	0	0	1.5E-03	2.1E+00	0.00070
Mercury, Dissolved	0	0.00038	0	5.1E-11	2.1E+00	0.000000000024
Nickel	50	0.041	0.19	2.7E-01	8.0E+01	0.0034
Silver, Dissolved	2.0	0	0.096	2.8E-02	3.3E-01	0.086
Thallium	0	0.0024	0	3.2E-10	2.1E-02	0.000000015
Thallium, Dissolved	0	0.0012	0	1.6E-10	2.1E-02	0.0000000076
Zinc	42	0	0.0000000000060	2.0E-01	9.0E+00	0.022
Bromomethane	0.18	0	0.19	3.8E-02	4.3E+01	0.00087
4-Methylphenol (p-Cresol)	3.9	0	1.4	2.9E-01	4.6E+02	0.00062
PCB-1260 (Aroclor 1260)	1.6	0	0.0019	7.9E-03	2.9E-01	0.027
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0	0.00000041	2.5E-06	1.6E-02	0.00016
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0.0000052	0.000013	9.7E-05	1.6E-03	0.060
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0	0.00000013	7.8E-07	1.6E-04	0.0048
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0.00000071	0.00000074	5.3E-06	1.6E-04	0.033
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0.000000016	9.7E-08	1.6E-05	0.0060
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0.0000000084	5.2E-08	1.6E-05	0.0033
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0.000000020	1.4E-07	1.6E-05	0.0090
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000040	0	0.00000000031	1.9E-09	1.6E-05	0.00012

TABLE H-16

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.000031	0	0.000000021	1.5E-07	1.6E-05	0.0093
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0.0000000070	4.3E-08	1.6E-05	0.0027
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0.0000000094	5.8E-08	3.2E-06	0.018
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0.000000023	1.4E-07	1.6E-06	0.088
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0.0000014	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	na	na	na	na
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	na	na	na	na
Diesel Range Organics	102,000	12	5,324	na	na	na
Diesel Range Organics, Aliphatic	81,600	9.6	4,259	1.2E+03	8.0E+01	15
Diesel Range Organics, Aromatic	40,800	4.8	2,130	6.1E+02	8.0E+01	7.6
Residual Range Organics	8,500	0	11.3	na	na	na
Residual Range Organics, Aliphatic	7,650	0	10.2	3.8E+01	8.69E+01	0.44
Residual Range Organics, Aromatic	2,550	0	3.4	1.3E+01	8.69E+01	0.15
					Max HQ	**15**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-17

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	9,850	0	4.7	15	2.8E-01	1.8E-01	1.5
Arsenic	15	0.017	0.063	0.029	4.2E-04	2.8E-01	0.0015
Barium	0	0.012	0	0	1.9E-11	4.7E-02	0.00000000039
Cadmium	3.4	0	0.15	0.0020	1.1E-04	9.3E-02	0.0012
Chromium	43	0.016	0	0.24	1.3E-03	3.2E-01	0.0042
Lead	196	0.065	1.1	0.059	5.4E-03	7.4E-01	0.0073
Manganese	164	0	5	0.068	4.9E-03	8.2E+00	0.00060
Mercury	0.3	0	0	0.078	7.5E-05	1.2E-01	0.00062
Mercury, Dissolved	0	0.00038	0	0	5.9E-13	1.2E-01	0.0000000000049
Nickel	50	0.041	0.19	0.30	1.6E-03	4.6E+00	0.00035
Silver, Dissolved	2.0	0	0.10	0.0063	6.8E-05	1.9E-02	0.0036
Thallium	0	0.0024	0.00000	0	3.7E-12	1.2E-03	0.0000000031
Thallium, Dissolved	0	0.001	0	0	1.9E-12	1.2E-03	0.0000000015
Zinc	42	0	0.0000000000060	4.2	4.7E-03	5.2E-01	0.0091
Bromomethane	0.18	0	0.19	0	2.3E-05	2.5E+00	0.0000091
4-Methylphenol (p-Cresol)	3.9	0	1.4	0	2.3E-04	2.7E+01	0.0000089
PCB-1260 (Aroclor 1260)	1.6	0	0.0019	0	4.3E-05	1.7E-02	0.0025
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0	0	0	1.4E-08	9.3E-04	0.000015
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0.0000052	0.000013	0	5.4E-07	9.3E-05	0.0058
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0	0.000000	0	4.3E-09	9.3E-06	0.00046
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0.00000071	0.00000074	0	2.9E-08	9.3E-06	0.0032
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0.000000016	0	5.4E-10	9.3E-07	0.00058
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0.0000000084	0	2.9E-10	9.3E-07	0.00031
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0.000000020	0	8.0E-10	9.3E-07	0.00087
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000040	0	0.0000000003	0	1.1E-11	9.3E-07	0.000012
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.000031	0	0.000000021	0	8.3E-10	9.3E-07	0.00090

TABLE H-17

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0.0000000070	0	2.4E-10	9.3E-07	0.00026
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0.0000000094	0	3.2E-10	1.9E-07	0.0017
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0.000000023	0	7.8E-10	9.3E-08	0.0084
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	na	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0.0000014	na	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	na	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	na	na	na	na	na
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	na	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	na	na	na	na	na
Diesel Range Organics	102,000	12	5,324	0	na	na	na
Diesel Range Organics, Aliphatic	81,600	9.6	4,259	0	2.6E+00	4.6E+00	0.56
Diesel Range Organics, Aromatic	40,800	4.8	2,130	0	1.3E+00	4.6E+00	0.28
Residual Range Organics	8,500	0	11	0.075	na	na	na
Residual Range Organics, Aliphatic	7,650	0	10	0.068	2.05E-01	5.01E+00	0.041
Residual Range Organics, Aromatic	2,550	0	3.4	0.023	6.84E-02	5.01E+00	0.014
						Max HQ	**1.5**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-18

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	9,850	0	0	4.7	0	1.7E-06	5.8E+01	0.000000030
Arsenic	15	0	0.017	0.06	0	2.3E-08	1.1E+00	0.000000022
Barium	0	0	0.012	0	0	8.1E-14	1.1E+01	0.0000000000000072
Cadmium	3.4	0	0	0.15	0	5.5E-08	1.3E+00	0.000000042
Chromium	43	0	0.016	0	0	1.1E-13	9.7E-01	0.00000000000011
Lead	196	0	0.065	1.1	0	3.9E-07	2.1E+00	0.00000018
Manganese	164	0	0	4.9	0	1.8E-06	5.7E+02	0.0000000032
Mercury	0.31	0	0	0.0	0	0.0E+00	2.6E-01	0
Mercury, Dissolved	0	0	0.00038	0	0	2.6E-15	2.6E-01	0.000000000000010
Nickel	50	0	0.041	0.19	0	7.1E-08	7.1E+01	0.0000000010
Silver, Dissolved	2.0	0	0	0.10	0	3.5E-08	1.6E+02	0.00000000022
Thallium	0	0	0.0024	0	0	1.6E-14	1.7E-01	0.0000000000
Thallium, Dissolved	0	0	0.0012	0	0	8.1E-15	1.7E-01	0.000000000000048
Zinc	42	0	0	0.0000000000060	0	2.2E-18	1.4E+02	0.00000000000000000016
Bromomethane	0.18	0	0	0.19	0	7.0E-08	na	na
4-Methylphenol (p-Cresol)	3.9	0	0	1.4	0	5.1E-07	na	na
PCB-1260 (Aroclor 1260)	1.6	0	0	0.0019	0	7.1E-10	2.0E-01	0.0000000036
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00052	0	0	0.00000041	0	1.5E-13	1.1E-01	0.0000000000014
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.020	0	0.0000052	0.000013	0	5.0E-12	1.1E-01	0.000000000047
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00016	0	0	0.00000013	0	4.6E-14	1.1E-03	0.000000000043
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0011	0	0.00000071	0.00000074	0	2.7E-13	1.1E-02	0.000000000026
1,2,3,4,7,8-Hexachlorodibenzofuran	0.000020	0	0	0.000000016	0	5.8E-15	1.1E-04	0.000000000054
1,2,3,6,7,8-Hexachlorodibenzofuran	0.000011	0	0	0.0000000084	0	3.1E-15	1.1E-04	0.000000000029
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.000030	0	0	0.000000020	0	7.5E-15	1.1E-03	0.0000000000070
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00000040	0	0	0.00000000031	0	1.2E-16	1.1E-04	0.0000000000011
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.000031	0	0	0.000000021	0	7.7E-15	1.1E-04	0.000000000072
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0000089	0	0	0.0000000070	0	2.6E-15	1.1E-04	0.000000000024
2,3,4,7,8-Pentachlorodibenzofuran	0.000012	0	0	0.0000000094	0	3.5E-15	1.1E-05	0.00000000032
2,3,7,8-Tetrachlorodibenzofuran	0.000029	0	0	0.000000023	0	8.4E-15	1.1E-05	0.00000000078
Total Heptachlorodibenzofurans (HpCDF)	0.00053	0	0	na	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.0022	0	0.0000014	na	na	na	na	na
Total Hexachlorodibenzofurans (HxCDF)	0.00019	0	0	na	na	na	na	na
Total Hexachlorodibenzo-p-dioxins (HxCDD)	0.00034	0	0	na	na	na	na	na

TABLE H-18

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 6 & 7 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Total Pentachlorodibenzofurans (PeCDF)	0.00011	0	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.00015	0	0	na	na	na	na	na
Total Tetrachlorodibenzo-p-dioxins (TCDD)	0.000039	0	0	na	na	na	na	na
Diesel Range Organics	102,000	0	12	5,324	0	na	na	na
Diesel Range Organics, Aliphatic	81,600	0	9.6	4,259	0	1.6E-03	4.3E-01	0.0037
Diesel Range Organics, Aromatic	40,800	0	4.8	2,130	0	7.9E-04	4.3E-01	0.0018
Residual Range Organics	8,500	0	0	11.3	0	na	na	na
Residual Range Organics, Aliphatic	7,650	0	0	10.2	0	3.76E-06	5.41E-01	0.0000070
Residual Range Organics, Aromatic	2,550	0	0	3.4	0	1.25E-06	5.41E-01	0.0000023
							Max HQ	**0.0037**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-19

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Antimony	14	0	0.34	1.3E-01	4.2E+00	0.031
Arsenic	17	0	0.073	9.4E-02	4.9E+00	0.019
Barium	0	0.015	0	2.0E-09	8.2E-01	0.0000000024
Cadmium	4.1	0	0	5.4E-02	1.6E+00	0.034
Chromium	29	0	0.026	1.4E-01	5.6E+00	0.025
Copper	98	0	4.7	1.4E+00	2.5E+01	0.055
Lead	276	0	1.5	1.6E+00	1.3E+01	0.12
Mercury	0.21	0	0.00095	1.2E-03	2.1E+00	0.00056
Nickel	27	0	0.10	1.5E-01	8.0E+01	0.0018
Selenium	1.0	0	0.0019	5.1E-03	6.6E-02	0.077
Zinc	459	0.0600	0.000000000066	2.2E+00	9.0E+00	0.24
1,2-Dibromoethane	0.000010	0	na	na	na	na
1,2-Dichlorobenzene	0.025	0	na	na	na	na
1,3-Dichlorobenzene	0.068	0	na	na	na	na
1,3-Dichloropropane	0.000097	0	na	na	na	na
2,2-Dichloropropane	0.00000092	0	na	na	na	na
2-Chloroethyl vinyl ether	0.0000026	0	na	na	na	na
2-Chlorotoluene	0.0000045	0	na	na	na	na
2-Hexanone	0.0000087	0	0.0000064	1.3E-06	4.0E+01	0.000000032
4-Bromophenyl phenyl ether	0.0000024	0	na	na	na	na
4-Chlorophenyl phenyl ether	0.0000029	0	na	na	na	na
4-Isopropyltoluene	0.0000047	0	na	na	na	na
Bromomethane	0.36	0	0	7.6E-02	4.3E+01	0.0017
2,4-Dichlorophenol	0.0000015	0	na	na	na	na
2,4-Dimethylphenol	0.0000014	0	na	na	na	na

TABLE H-19

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
2,4-Dinitrotoluene	0.0000016	0	na	na	na	na
2,6-Dinitrotoluene	0.0000016	0	na	na	na	na
2-Methyl-4,6-dinitrophenol	0.0000037	0	na	na	na	na
3,3-Dichlorobenzidine	0.00000068	0	na	na	na	na
3-Nitroaniline	0.0000019	0	na	na	na	na
4-Chloroaniline	0.000030	0	0.000012	2.5E-06	1.7E+00	0.0000015
4-Chlorotoluene	0.025	0	na	na	na	na
4-Methylphenol (o-Cresol)	0.00000035	0	0.00000012	2.6E-08	4.6E+02	0.000000000056
4-Nitroaniline	0.00013	0	na	na	na	na
PCB-1260 (Aroclor 1260)	0.13	0	0	6.4E-04	2.9E-01	0.0022
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00012	0	0	5.8E-07	1.6E-02	0.000036
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0011	0.00000000037	0	5.3E-06	1.6E-03	0.0033
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000030	0	0	1.5E-07	1.6E-04	0.00091
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00012	0	0	5.8E-07	1.6E-04	0.0036
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0000066	0	0	3.2E-08	1.6E-05	0.0020
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000079	0	0	3.8E-08	1.6E-05	0.0024
2,3,7,8-Tetrachlorodibenzofuran	0.0000066	0	0	3.2E-08	1.6E-06	0.020
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000014	0	0	6.7E-09	1.6E-06	0.0041
Total Heptachlorodibenzofurans (HpCDF)	0.000095	0	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.00018	0	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.000010	0	na	na	na	na
Diesel Range Organics	462	0	24	na	na	na
Diesel Range Organics, Aliphatic	370	0	19	5.5E+00	8.0E+01	0.069
Diesel Range Organics, Aromatic	185	0	10	2.8E+00	8.0E+01	0.034
Residual Range Organics	1,539	0	2	na	na	na

TABLE H-19

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Residual Range Organics, Aliphatic	1,385	0	2	6.9E+00	8.69E+01	0.079
Residual Range Organics, Aromatic	462	0	1	2.3E+00	8.69E+01	0.026
					Max HQ	**0.24**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-20

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	14	0	0.34	0.014	1.6E-04	2.4E-01	0.00064
Arsenic	17	0	0.073	0.034	1.8E-04	2.8E-01	0.00064
Barium	0	0.015	0	0	8.6E-12	4.7E-02	0.00000000018
Cadmium	4.1	0	0	0.0024	4.8E-05	9.3E-02	0.00052
Chromium	29	0	0.026	0.160	3.4E-04	3.2E-01	0.00105
Copper	98	0	4.7	1.0	1.5E-03	1.4E+00	0.0010
Lead	276	0	1.5	0.083	2.8E-03	7.4E-01	0.0038
Mercury	0.21	0	0.00095	0.053	1.9E-05	1.2E-01	0.00016
Nickel	27	0	0.10	0.16	3.2E-04	4.6E+00	0.000070
Selenium	1.0	0	0.0019	0.015	1.5E-05	3.8E-03	0.0039
Zinc	459	0.060	0.000000000066	46	1.9E-02	5.2E-01	0.037
1,2-Dibromoethane	0.000010	0	na	na	na	na	na
1,2-Dichlorobenzene	0.025	0	na	na	na	na	na
1,3-Dichlorobenzene	0.068	0	na	na	na	na	na
1,3-Dichloropropane	0.000097	0	na	na	na	na	na
2,2-Dichloropropane	0.00000092	0	na	na	na	na	na
2-Chloroethyl vinyl ether	0.0000026	0	na	na	na	na	na
2-Chlorotoluene	0.0000045	0	na	na	na	na	na
2-Hexanone	0.0000087	0	0.0000064	0.000000000000041	3.1E-10	2.3E+00	0.00000000014
4-Bromophenyl phenyl ether	0.0000024	0	na	na	na	na	na
4-Chlorophenyl phenyl ether	0.0000029	0	na	na	na	na	na
4-Isopropyltoluene	0.0000047	0	na	na	na	na	na
Bromomethane	0.36	0	0.38	0.0000000013	1.7E-05	2.5E+00	0.0000068
2,4-Dichlorophenol	0.0000015	0	na	na	na	na	na
2,4-Dimethylphenol	0.0000014	0	na	na	na	na	na
2,4-Dinitrotoluene	0.0000016	0	na	na	na	na	na
2,6-Dinitrotoluene	0.0000016	0	na	na	na	na	na
2-Methyl-4,6-dinitrophenol	0.0000037	0	na	na	na	na	na
3,3-Dichlorobenzidine	0.00000068	0	na	na	na	na	na

TABLE H-20

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
3-Nitroaniline	0.0000019	0	na	na	na	na	na
4-Chloroaniline	0.000030	0	0.000012	0.00000000000023	7.3E-10	9.7E-02	0.0000000075
4-Chlorotoluene	0.0250	0	na	na	na	na	na
4-Methylphenol (o-Cresol)	0.00000035	0	0.00000012	0.0000000000000030	7.8E-12	2.7E+01	0.00000000000030
4-Nitroaniline	0.00013	0	na	na	na	na	na
PCB-1260 (Aroclor 1260)	0.13	0	0.00016	0.0000014	1.3E-06	1.7E-02	0.000077
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00012	0	0.000000094	0.0000000026	1.2E-09	9.3E-04	0.0000013
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0011	0.00000000037	0.00000074	0.000000031	1.1E-08	9.3E-05	0.00012
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000030	0	0.000000023	0.00000000065	3.0E-10	9.3E-06	0.000032
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00012	0	0.000000081	0.0000000033	1.2E-09	9.3E-06	0.00013
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0000066	0	0.0000000052	0.00000000014	6.6E-11	9.3E-07	0.000071
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000079	0	0.0000000053	0.00000000022	7.8E-11	9.3E-07	0.000084
2,3,7,8-Tetrachlorodibenzofuran	0.0000066	0	0.0000000052	0.00000000014	6.6E-11	9.3E-08	0.00071
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000014	0	0.0000000011	0.000000000030	1.4E-11	9.3E-08	0.00015
Total Heptachlorodibenzofurans (HpCDF)	0.000095	0	na	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.00018	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.000010	0	na	na	na	na	na
Diesel Range Organics	462	0	24	0.000021	na	na	na
Diesel Range Organics, Aliphatic	370	0	19	0.000017	4.3E-03	4.6E+00	0.00094
Diesel Range Organics, Aromatic	185	0	10	0.0000086	2.2E-03	4.6E+00	0.00047
Residual Range Organics	1,539	0	2.0	0.014	na	na	na
Residual Range Organics, Aliphatic	1,385	0	1.8	0.012	1.38E-02	5.01E+00	0.0028
Residual Range Organics, Aromatic	462	0	0.61	0.0041	4.60E-03	5.01E+00	0.00092
						Max HQ	**0.037**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.

TABLE H-20

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-21

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	14	0	0	0.34	0	4.6E-08	1.1E+00	0.000000044
Arsenic	17	0	0	0.073	0	1.0E-08	1.1E+00	0.000000010
Barium	0	0	0.015	0	0	3.8E-14	1.1E+01	0.0000000000000033
Cadmium	4.1	0	0	0.18	0	2.5E-08	1.3E+00	0.000000019
Chromium	29	0	0	0.026	0	3.6E-09	9.7E-01	0.00000000370
Copper	98	0	0	4.7	0	6.5E-07	2.5E+01	0.000000025
Lead	276	0	0	1.5	0	2.0E-07	2.1E+00	0.00000010
Mercury	0.21	0	0	0.00095	0	1.3E-10	2.6E-01	0.00000000051
Nickel	27	0	0	0.10	0	1.4E-08	7.1E+01	0.00000000020
Selenium	1.0	0	0	0.0019	0	2.6E-10	4.6E-01	0.00000000058
Zinc	459	0	0.060	0.000000000066	0	1.5E-13	1.4E+02	0.0000000000000011
1,2-Dibromoethane	0.000010	0	0	na	0	na	na	na
1,2-Dichlorobenzene	0.025	0	0	na	0	na	na	na
1,3-Dichlorobenzene	0.068	0	0	na	0	na	na	na
1,3-Dichloropropane	0.000097	0	0	na	0	na	na	na
2,2-Dichloropropane	0.00000092	0	0	na	0	na	na	na
2-Chloroethyl vinyl ether	0.0000026	0	0	na	0	na	na	na
2-Chlorotoluene	0.0000045	0	0	na	0	na	na	na
2-Hexanone (MIBK)	0.0000087	0	0	0.0000064	0	8.9E-13	na	na
4-Bromophenyl phenyl ether	0.0000024	0	0	na	0	na	na	na
4-Chlorophenyl phenyl ether	0.0000029	0	0	na	0	na	na	na
4-Isopropyltoluene	0.0000047	0	0	na	0	na	na	na
2,4-Dichlorophenol	0.0000015	0	0	na	0	na	na	na
2,4-Dimethylphenol	0.0000014	0	0	na	0	na	na	na
2,4-Dinitrotoluene	0.0000016	0	0	na	0	na	na	na
2,6-Dinitrotoluene	0.0000016	0	0	na	0	na	na	na
2-Methyl-4,6-dinitrophenol	0.0000037	0	0	na	0	na	na	na
3,3-Dichlorobenzidine	0.00000068	0	0	na	0	na	na	na
3-Nitroaniline	0.0000019	0	0	na	0	na	na	na
4-Chloroaniline	0.000030	0	0	0.000012	0	1.7E-12	1.9E-01	0.0000000000087
4-Chlorotoluene	0.025	0	0	na	0	na	na	na
4-Methylphenol (o-Cresol)	0.00000035	0	0	0.00000012	0	1.7E-14	na	na

TABLE H-21

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 9 - Housing and Operations Lanfill
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
4-Nitroaniline	0.000130	0	0	na	0	na	na	na
PCB-1260 (Aroclor 1260)	0.13	0	0	0.00016	0	2.1E-11	2.0E-01	0.00000000011
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.00012	0	0	0.000000094	0	1.3E-14	1.1E-01	0.00000000000012
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.0011	0	0.00000000037	0.00000074	0	1.0E-13	1.1E-01	0.0000000000010
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.000030	0	0	0.000000023	0	3.2E-15	1.1E-03	0.0000000000030
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00012	0	0	0.000000081	0	1.1E-14	1.1E-02	0.0000000000010
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0000066	0	0	0.0000000052	0	7.1E-16	1.1E-04	0.0000000000066
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0000079	0	0	0.0000000053	0	7.3E-16	1.1E-04	0.0000000000068
2,3,7,8-Tetrachlorodibenzofuran	0.0000066	0	0	0.0000000052	0	7.1E-16	1.1E-05	0.000000000066
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000014	0	0	0.0000000011	0	1.5E-16	1.1E-05	0.000000000014
Total Heptachlorodibenzofurans (HpCDF)	0.000095	0	0	na	na	na	na	na
Total Heptachlorodibenzo-p-dioxins (HpCDD)	0.00018	0	0	na	na	na	na	na
Total Tetrachlorodibenzofurans (TCDF)	0.000010	0	0	na	na	na	na	na
Diesel Range Organics	462	0	0	24	0	na	na	na
Diesel Range Organics, Aliphatic	370	0	0	19	0	2.7E-06	4.3E-01	0.0000062
Diesel Range Organics, Aromatic	185	0	0	9.6	0	1.3E-06	4.3E-01	0.0000031
Residual Range Organics	1,539	0	0	2.0	0	na	na	na
Residual Range Organics, Aliphatic	1,385	0	0	1.8	0	2.53E-07	5.41E-01	0.00000047
Residual Range Organics, Aromatic	462	0	0	0.61	0	8.44E-08	5.41E-01	0.00000016
							Max HQ	**0.0000062**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-22

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Aluminum	21,708	0	10	1.0E+02	3.1E+00	34
Antimony	9.7	0	0.23	9.1E-02	4.2E+00	0.022
Arsenic	28	0.0020	0.12	1.6E-01	4.9E+00	0.031
Barium	141	0.010	2.5	1.2E+00	8.2E-01	1.4
Cadmium	5	0	0.22	6.6E-02	1.6E+00	0.041
Chromium	44	0	0.040	2.1E-01	5.6E+00	0.038
Copper	63	0	3.0	8.9E-01	2.5E+01	0.035
Manganese	0	0.69	0	9.2E-08	1.4E+02	0.00000000065
Mercury	0.80	0	0.004	4.5E-03	2.1E+00	0.0021
Selenium	2.0	0	0.0038	1.0E-02	6.6E-02	0.15
Silver	2.1	0	0.10	3.0E-02	3.3E-01	0.091
Vanadium	56	0	0.10	2.8E-01	3.4E+00	0.084
Zinc	480	0	0.00	2.3E+00	9.0E+00	0.25
4-Chloroaniline	5.5	0	2.2	4.6E-01	1.7E+00	0.27
PCB-1254 (Aroclor 1254)	0.14	0	0	6.9E-04	2.9E-01	0.0024
PCB-1260 (Aroclor 1260)	2.4	0	0	1.2E-02	2.9E-01	0.040
Diesel Range Organics	3,800	0.47	198	na	na	na
Diesel Range Organics, Aliphatic	3,040	0.38	159	4.5E+01	8.0E+01	0.56
Diesel Range Organics, Aromatic	1,520	0.19	79	2.3E+01	8.0E+01	0.28
Residual Range Organics	2,384	0	3.2	na	na	na
Residual Range Organics, Aliphatic	2,146	0	2.9	1.06E+01	8.69E+01	0.12
Residual Range Organics, Aromatic	715	0	1.0	3.55E+00	8.69E+01	0.041
					Max HQ	**34**

Notes:
HQ - Hazard Quotient

TABLE H-22

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ

mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-23

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	21,708	0	10	33	1.2E-01	1.8E-01	0.65
Antimony	9.7	0	0.23	0.010	5.5E-05	2.4E-01	0.00023
Arsenic	28	0.0020	0.12	0.056	1.5E-04	2.8E-01	0.00054
Barium	141	0.010	2.5	0.022	7.7E-04	4.7E-02	0.016
Cadmium	5	0	0.22	0.0029	3.0E-05	9.3E-02	0.0003
Chromium	44	0	0.040	0.24	2.6E-04	3.2E-01	0.00081
Copper	63	0	3.0	0.66	4.8E-04	1.4E+00	0.00033
Manganese	0	0.69	0	0	2.0E-10	8.2E+00	0.000000000025
Mercury	0.80	0	0.004	0.20	3.7E-05	1.2E-01	0.00031
Selenium	2.0	0	0.0038	0.030	1.5E-05	3.8E-03	0.0040
Silver	2.1	0	0.10	0.0066	1.4E-05	1.9E-02	0.00072
Vanadium	56	0	0.10	0.14	3.1E-04	1.9E-01	0.0016
Zinc	480	0	0	48	1.0E-02	5.2E-01	0.020
4-Chloroaniline	5.5	0	2.2	0.000000041	6.8E-05	9.7E-02	0.00070
PCB-1254 (Aroclor 1254)	0.14	0	0.00017	0.0000015	7.1E-07	1.7E-02	0.000042
PCB-1260 (Aroclor 1260)	2.4	0	0.0029	0.00003	1.2E-05	1.7E-02	0.00073
Diesel Range Organics	3,800	0.47	198	0.00018	na	na	na
Diesel Range Organics, Aliphatic	3,040	0.38	159	0.00014	1.8E-02	4.6E+00	0.0040
Diesel Range Organics, Aromatic	1,520	0.19	79	0.000071	9.2E-03	4.6E+00	0.0020
Residual Range Organics	2,384	0	3.2	0.021	na	na	na
Residual Range Organics, Aliphatic	2,146	0	2.9	0.019	1.10E-02	5.01E+00	0.0022
Residual Range Organics, Aromatic	715	0	1.0	0.0063	3.65E-03	5.01E+00	0.00073
						Max HQ	**0.65**

Notes:
DRO -Diesel Range Organics.

TABLE H-23

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

GRO - Gasoline Range Organics.
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.
RRO - Residual Range Organics.

TABLE H-24

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	21,708	0	0	10	0	7.3E-07	5.8E+01	0.000000013
Antimony	9.7	0	0	0.23	0	1.6E-08	1.1E+00	0.000000015
Arsenic	28	0	0.0020	0.12	0	8.5E-09	1.1E+00	0.000000008
Barium	141	0	0.010	2.5	0	1.8E-07	1.1E+01	0.000000016
Cadmium	5	0	0	0.22	0	1.5E-08	1.3E+00	0.000000012
Chromium	44	0	0	0.040	0	2.8E-09	9.7E-01	0.0000000029
Copper	63	0	0	3.0	0	2.1E-07	2.5E+01	0.0000000084
Manganese	0	0	0.69	0	0	8.8E-13	5.7E+02	0.0000000000000016
Mercury	0.80	0	0	0.0036	0	2.5E-10	2.6E-01	0.0000000010
Selenium	2.0	0	0	0.0038	0	2.7E-10	4.6E-01	0.00000000059
Silver	2.1	0	0	0.10	0	7.1E-09	1.6E+02	0.00000000004
Vanadium	56	0	0	0.10	0	7.1E-09	1.0E+01	0.00000000070
Zinc	480	0	0	0.000000000069	0	4.9E-18	1.4E+02	0.00000000000000000035
4-Chloroaniline	5.5	0	0	2.2	0	1.6E-07	1.9E-01	0.00000081
PCB-1254 (Aroclor 1254)	0.14	0	0	0.00017	0	1.2E-11	1.6E-01	0.000000000076
PCB-1260 (Aroclor 1260)	2.4	0	0	0.0029	0	2.0E-10	2.0E-01	0.0000000010
Diesel Range Organics	3,800	0	0.47	198	0	na	na	na
Diesel Range Organics, Aliphatic	3,040	0	0.38	159	0	1.1E-05	4.3E-01	0.000026
Diesel Range Organics, Aromatic	1,520	0	0.19	79	0	5.6E-06	4.3E-01	0.000013
Residual Range Organics	2,384	0	0	3.2	0	na	na	na
Residual Range Organics, Aliphatic	2,146	0	0	2.9	0	2.01E-07	5.41E-01	0.00000037
Residual Range Organics, Aromatic	715	0	0	1.0	0	6.70E-08	5.41E-01	0.00000012
							Max HQ	**0.000026**

Notes:
DRO -Diesel Range Organics.
GRO - Gasoline Range Organics.
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-24

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 21 - Wastewater Treatment Facility
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

RRO - Residual Range Organics.

TABLE H-25

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 22 - Water Wells and Water Supply Building
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Antimony	34	0	0.82	3.2E-01	4.2E+00	0.076
Lead	497	0	2.7	2.9E+00	1.3E+01	0.22
Zinc	160	0	0.000000000023	7.5E-01	9.0E+00	0.083
Di-n-butyl phthalate	3.5	0	0.030	2.2E-02	4.8E+02	0.000047
Benzo(a)pyrene	0.079	0	0.00011	3.9E-04	8.7E+01	0.0000045
Benzo(b)fluoranthene	0.20	0	0.00024	9.9E-04	8.7E+01	0.000011
Chrysene	0.77	0	0.0017	4.0E-03	8.7E+01	0.000045
Naphthalene	1.2	0	0.063	1.8E-02	8.0E+01	0.00022
Phenanthrene	0.21	0	0.0023	1.4E-03	8.7E+01	0.000016
Diesel Range Organics	4,070	0	212	na	na	na
Diesel Range Organics, Aliphatic	3,256	0	170	4.9E+01	8.0E+01	0.60
Diesel Range Organics, Aromatic	1,628	0	85	2.4E+01	8.0E+01	0.30
Gasoline Range Organics	38	0	10	na	na	na
Gasoline Range Organics, Aliphatic	27	0	7.2	1.53E+00	2.30E+01	0.067
Gasoline Range Organics, Aromatic	19	0	5.1	1.09E+00	2.30E+01	0.048
Residual Range Organics	3,815	0	5.1	na	na	na
Residual Range Organics, Aliphatic	3,434	0	4.6	1.70E+01	8.69E+01	0.20
Residual Range Organics, Aromatic	1,145	0	1.5	5.67E+00	8.69E+01	0.065
					Max HQ	**0.60**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable

TABLE H-25

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 22 - Water Wells and Water Supply Building
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ

PCB - Polychlorinated Biphenyls.

TABLE H-26

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 22 - Water Wells and Water Supply Building
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	34	0	0.82	0.035	2.0E-05	2.4E-01	0.000082
Lead	497	0	2.7	0.15	2.7E-04	7.4E-01	0.00036
Zinc	160	0	0.000000000023	16	3.5E-04	5.2E-01	0.00068
Di-n-butyl phthalate	3.5	0	0.030	0.0000016	1.9E-06	2.8E+01	0.000000068
Benzo(a)pyrene	0.08	0	0.00011	0.00000070	4.2E-08	5.0E+00	0.0000000083
Benzo(b)fluoranthene	0.20	0	0.00024	0.0000021	1.1E-07	5.0E+00	0.000000021
Chrysene	0.77	0	0.0017	0.0000029	4.1E-07	5.0E+00	0.000000081
Naphthalene	1.2	0	0.063	0.000000056	7.4E-07	4.6E+00	0.00000016
Phenanthrene	0.21	0	0.0023	0.000000067	1.1E-07	5.0E+00	0.000000023
Diesel Range Organics	4,070	0	212	0.00019	na	na	na
Diesel Range Organics, Aliphatic	3,256	0	170	0.00015	2.0E-03	4.6E+00	0.00044
Diesel Range Organics, Aromatic	1,628	0	85	0.000076	1.0E-03	4.6E+00	0.00022
Gasoline Range Organics	38	0	10	0.00000040	na	na	na
Gasoline Range Organics, Aliphatic	27	0	7.2	0.00000028	2.73E-05	1.32E+00	0.000021
Gasoline Range Organics, Aromatic	19	0	5.1	0.00000020	1.95E-05	1.32E+00	0.000015
Residual Range Organics	3,815	0	5.1	0.034	na	na	na
Residual Range Organics, Aliphatic	3,434	0	4.6	0.030	1.80E-03	5.01E+00	0.00036
Residual Range Organics, Aromatic	1,145	0	1.5	0.010	6.01E-04	5.01E+00	0.00012
						Max HQ	**0.00068**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable

TABLE H-26

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 22 - Water Wells and Water Supply Building
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

PCB - Polychlorinated Biphenyls.

TABLE H-27

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 22 - Water Wells and Water Supply Building
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	34	0	0	0.82	0	5.9E-09	1.1E+00	0.0000000056
Lead	497	0	0	2.7	0	1.9E-08	2.1E+00	0.0000000092
Zinc	160	0	0	0.000000000023	0	1.7E-19	1.4E+02	0.00000000000000000000012
Di-n-butyl phthalate	3.5	0	0	0.030	0	2.2E-10	6.3E-02	0.0000000035
Benzo(a)pyrene	0.079	0	0	0.00011	0	7.6E-13	5.4E-01	0.0000000000014
Benzo(b)fluoranthene	0.20	0	0	0.00024	0	1.8E-12	5.4E-01	0.0000000000032
Chrysene	0.77	0	0	0.0017	0	1.2E-11	5.4E-01	0.000000000023
Naphthalene	1.2	0	0	0.063	0	4.5E-10	4.3E-01	0.0000000011
Phenanthrene	0.21	0	0	0.0023	0	1.7E-11	5.4E-01	0.000000000031
Diesel Range Organics	4,070	0	0	212	0	na	na	na
Diesel Range Organics, Aliphatic	3,256	0	0	170	0	1.2E-06	4.3E-01	0.0000029
Diesel Range Organics, Aromatic	1,628	0	0	85	0	6.2E-07	4.3E-01	0.0000014
Gasoline Range Organics	38	0	0	10	0	na	na	na
Gasoline Range Organics, Aliphatic	27	0	0	7.2	0	5.2E-08	4.3E-01	0.00000012
Gasoline Range Organics, Aromatic	19	0	0	5.1	0	3.7E-08	4.3E-01	0.000000087
Residual Range Organics	3,815	0	0	5.1	0	na	na	na
Residual Range Organics, Aliphatic	3,434	0	0	4.6	0	3.31E-08	5.41E-01	0.000000061
Residual Range Organics, Aromatic	1,145	0	0	1.5	0	1.10E-08	5.41E-01	0.000000020
							Max HQ	**0.0000029**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-28

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Antimony	0	0	0.0030	5.9E-04	4.2E+00	0.00014
Arsenic	0	0	1.6	3.1E-01	4.9E+00	0.064
Barium	0	0	40	7.8E+00	8.2E-01	9.6
Beryllium	1.5	0	0.0018	7.4E-03	1.1E+00	0.0070
Cadmium	0	0	0.47	9.2E-02	1.6E+00	0.057
Chromium	0	0.015	24	4.6E+00	5.6E+00	0.82
Copper	0	0.040	3.6	7.0E-01	2.5E+01	0.028
Lead or Lead Dissolved	0	0.86	11	2.2E+00	1.3E+01	0.17
Mercury or Mercury Dissolved	0	0	0.11	2.1E-02	2.1E+00	0.010
Nickel	0	0	3.4	6.7E-01	8.0E+01	0.0083
Selenium	0	0	0.23	4.5E-02	6.6E-02	0.68
Silver	0	0	0.033	6.4E-03	3.3E-01	0.020
Vanadium	0	0	6.8	1.3E+00	3.4E+00	0.39
Zinc	0	0.62	58	1.1E+01	9.0E+00	1.3
Zinc, Dissolved	0	0.23	0	3.1E-08	9.0E+00	0.0000000034
2-Methylnaphthalene	0	0	0.012	2.3E-03	8.7E+01	0.000027
Acenaphthene	0	0	0.029	5.7E-03	8.7E+01	0.000065
Anthracene	1.1	0	0.013	7.7E-03	8.7E+01	0.000089
Benzo(a)anthracene	4.4	0	0.088	3.8E-02	1.5E+02	0.00026
Benzo(a)pyrene	2.3	0	0.11	3.2E-02	8.7E+01	0.00037
Benzo(b)fluoranthene	2.6	0	0.089	3.0E-02	8.7E+01	0.00034
Benzo(g,h,i)perylene	0	0	0.055	1.1E-02	8.7E+01	0.00012
Benzo(k)fluoranthene	2.7	0	0.20	5.2E-02	8.7E+01	0.00060
Chrysene	5.5	0	0.18	6.1E-02	8.7E+01	0.00070
Fluoranthene	0.89	0	0.73	1.5E-01	8.7E+01	0.0017

TABLE H-28

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Fluorene	0	0	0.027	5.3E-03	8.7E+01	0.000061
Indeno(1,2,3-cd)pyrene	0	0	0.11	2.2E-02	8.7E+01	0.00025
Naphthalene	0	0	0.015	2.9E-03	8.0E+01	0.000037
Phenanthrene	4.1	0	0.59	1.3E-01	8.7E+01	0.0015
Pyrene	7.5	0	0.53	1.4E-01	8.7E+01	0.0016
PCB-1254 (Aroclor 1254)	0.47	0	3.0	5.9E-01	2.9E-01	2.0
PCB-1260 (Aroclor 1260)	0	0.00081	0.61	1.2E-01	2.9E-01	0.41
Diesel Range Organics	92,650	46	4,836	na	na	na
Diesel Range Organics, Aliphatic	74,120	37	3,869	1.1E+03	8.0E+01	14
Diesel Range Organics, Aromatic	29,648	15	1,548	4.4E+02	8.0E+01	5.5
Gasoline Range Organics	120	0.57	32	na	na	na
Gasoline Range Organics, Aliphatic	84	0.40	23	4.84E+00	2.30E+01	0.21
Gasoline Range Organics, Aromatic	60	0.28	16	3.46E+00	2.30E+01	0.15
Residual Range Organics	2,073	0	2.8	na	na	na
Residual Range Organics, Aliphatic	1,866	0	2.5	9.25E+00	8.69E+01	0.11
Residual Range Organics, Aromatic	622	0	0.83	3.08E+00	8.69E+01	0.035
					Max HQ	**14**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-29

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	0	0	0.0030	0.0000030	4.0E-07	2.4E-01	0.0000017
Arsenic	0	0	1.6	0.0032	2.2E-04	2.8E-01	0.00076
Barium	0	0	40	0.0060	5.3E-03	4.7E-02	0.11
Beryllium	1.5	0	0.0018	0.0015	5.8E-05	6.1E-02	0.00095
Cadmium	0	0	0.47	0.00026	6.3E-05	9.3E-02	0.00068
Chromium	0	0.015	24	0.13	3.3E-03	3.2E-01	0.010
Copper	0	0.040	3.6	0.036	5.2E-04	1.4E+00	0.00036
Lead/Dissolved	0	0.86	11	0.0033	1.5E-03	7.4E-01	0.0020
Mercury/Dissolved	0	0	0.11	0.027	4.7E-05	1.2E-01	0.00039
Nickel	0	0	3.4	0.020	4.8E-04	4.6E+00	0.00010
Selenium	0	0	0.23	0.0035	3.5E-05	3.8E-03	0.0091
Silver	0	0	0.033	0.00010	4.5E-06	1.9E-02	0.00024
Vanadium	0	0	6.8	0.017	9.3E-04	1.9E-01	0.0048
Zinc	0	0.62	58	5.8	1.5E-02	5.2E-01	0.028
Zinc/Dissolved	0	0.23	0	0	5.0E-10	5.2E-01	0.0000000010
2-Methylnaphthalene	0	0	0.012	0	1.6E-06	5.0E+00	0.00000032
Acenaphthene	0	0	0.029	0.000000062	3.9E-06	5.0E+00	0.00000077
Anthracene	1.1	0	0.013	0.00000029	4.3E-05	5.0E+00	0.0000085
Benzo(a)anthracene	4.4	0	0.088	0.000024	1.8E-04	8.4E+00	0.000021
Benzo(a)pyrene	2.3	0	0.11	0.000058	1.0E-04	5.0E+00	0.000020
Benzo(b)fluoranthene	2.6	0	0.089	0.000062	1.1E-04	5.0E+00	0.000022
Benzo(g,h,i)perylene	0	0	0.055	0.000071	7.4E-06	5.0E+00	0.0000015
Benzo(k)fluoranthene	2.7	0	0.20	0.00011	1.3E-04	5.0E+00	0.000025
Chrysene	5.5	0	0.18	0.00004	2.3E-04	5.0E+00	0.000046
Fluoranthene	0.89	0	0.73	0.000023	1.3E-04	5.0E+00	0.000026
Fluorene	0	0	0	0.00000010	3.6E-06	5.0E+00	0.00000072

TABLE H-29

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Indeno(1,2,3-cd)pyrene	0	0	0.11	0.00023	1.5E-05	5.0E+00	0.0000030
Naphthalene	0	0	0.015	0	2.0E-06	4.6E+00	0.00000043
Phenanthrene	4.1	0	0.59	0.0000063	2.3E-04	5.0E+00	0.000046
Pyrene	7.5	0	0.53	0.000018	3.5E-04	5.0E+00	0.000070
PCB-1254 (Aroclor 1254)	0.47	0	3.0	0.0013	4.2E-04	1.7E-02	0.025
PCB-1260 (Aroclor 1260)	0	0.00081	0.61	0.00025	8.2E-05	1.7E-02	0.0048
Diesel Range Organics	92,650	46	4,836	0.0043	na	na	na
Diesel Range Organics, Aliphatic	74,120	37	3,869	0.0034	3.3E+00	4.6E+00	0.71
Diesel Range Organics, Aromatic	29,648	15	1,548	0.0014	1.3E+00	4.6E+00	0.28
Gasoline Range Organics	120	0.57	32	0.0000012	na	na	na
Gasoline Range Organics, Aliphatic	84	0.40	23	0.00000087	6.16E-03	1.32E+00	0.0047
Gasoline Range Organics, Aromatic	60	0.28	16	0.00000062	4.40E-03	1.32E+00	0.0033
Residual Range Organics	2,073	0	2.8	0.018	na	na	na
Residual Range Organics, Aliphatic	1,866	0	2.5	0.016	6.99E-02	5.01E+00	0.014
Residual Range Organics, Aromatic	622	0	0.83	0.0055	2.33E-02	5.01E+00	0.0046
						Max HQ	**0.71**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-30

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	0	0	0	0.0030	0.0070	7.0E-08	1.1E+00	0.000000066
Arsenic	0	0	0	1.6	0.080	1.6E-06	1.1E+00	0.0000015
Barium	0	0	0	40	1.1	3.1E-05	1.1E+01	0.0000028
Beryllium	1.5	0	0	0.0018	0	9.3E-10	1.1E+01	0.000000000083
Cadmium	0	0	0	0.47	0.0080	3.2E-07	1.3E+00	0.00000024
Chromium	0	28	0.015	24	0	4.0E-05	9.7E-01	0.000041
Copper	0	0	0.040	3.6	1.2	1.4E-05	2.5E+01	0.00000054
Lead/Dissolved	0	7.4	0.86	11	0.028	1.3E-05	2.1E+00	0.0000063
Mercury/Dissolved	0	0	0	0.11	0.098	1.0E-06	2.6E-01	0.0000040
Nickel	0	0	0	3.4	1.1	1.3E-05	7.1E+01	0.00000018
Selenium	0	0	0	0.23	0.16	1.7E-06	4.6E-01	0.0000037
Silver, Dissolved	0	0	0	0.033	0	1.7E-08	1.6E+02	0.00000000010
Vanadium	0	0	0	6.8	0.11	4.6E-06	1.0E+01	0.00000046
Zinc	0	26	0.62	58	51	5.6E-04	1.4E+02	0.0000040
Zinc/Dissolved	0	0	0.23	0	0	2.2E-12	1.4E+02	0.000000000000015
Ethylbenzene	0	1.8	0	0	0	1.8E-06	na	na
Toluene	0	0.37	0	0	0	3.7E-07	na	na
Xylenes	0	0.78	0	0	0	7.7E-07	na	na
Dibenzofuran	0	4.5	0	0	0	4.5E-06	1.1E-01	0.000042
2-Methylnaphthalene	0	500	0	0.012	0.19	5.0E-04	5.4E-01	0.00092
Acenaphthene	0	14	0	0.029	0.026	1.4E-05	5.4E-01	0.000026
Acenaphthylene	0	0.047	0	0	0	4.6E-08	5.4E-01	0.000000085
Anthracene	1.1	1.8	0	0.013	0	1.8E-06	5.4E-01	0.0000033
Benzo(a)anthracene	4.4	1.5	0	0.088	0	1.6E-06	4.3E-01	0.0000037
Benzo(a)pyrene	2.3	1.4	0	0.11	0	1.4E-06	5.4E-01	0.0000026
Benzo(b)fluoranthene	2.6	1.5	0	0.089	0	1.5E-06	5.4E-01	0.0000028
Benzo(g,h,i)perylene	0	0.91	0	0.055	0.0043	9.7E-07	5.4E-01	0.0000018
Benzo(k)fluoranthene	2.7	1.5	0	0.20	0	1.6E-06	7.6E-02	0.000021
Chrysene	5.5	1.8	0	0.18	0	1.9E-06	5.4E-01	0.0000035

TABLE H-30

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Dibenzo(a,h)anthracene	0	0.015	0	0.014	0	2.2E-08	2.1E-01	0.00000010
Fluoranthene	0.89	2.8	0	0.73	0.0037	3.1E-06	5.4E-01	0.0000058
Fluorene	0	20	0	0.027	0.067	2.0E-05	5.4E-01	0.000038
Indeno(1,2,3-cd)pyrene	0	1.2	0	0.11	0	1.2E-06	5.4E-01	0.0000023
Naphthalene	0	175	0	0.015	0.068	1.7E-04	4.3E-01	0.00041
Phenanthrene	4.1	21	0	0.59	0.018	2.1E-05	5.4E-01	0.000039
Pyrene	7.5	9.5	0	0.53	0.0023	9.7E-06	5.4E-01	0.000018
PCB-1242 (Aroclor 1242)	0	0.10	0	0	0	9.8E-08	2.6E-01	0.00000038
PCB-1254 (Aroclor 1254)	0.47	0.16	0	3.0	0	1.7E-06	1.6E-01	0.000011
PCB-1260 (Aroclor 1260)	0	0.52	0.0	0.61	0.14	2.2E-06	2.0E-01	0.000011
4,4'-DDD	0	1.2	0	0	0	1.1E-06	4.8E+02	0.0000000024
beta-BHC	0	0.010	0	0	0	9.9E-09	5.2E+00	0.0000000019
Endosulfan sulfate	0	0.0086	0	0	0	8.5E-09	7.3E+00	0.0000000012
gamma-BHC (Lindane)	0	0.0065	0	0	0	6.4E-09	5.2E+00	0.0000000012
Heptachlor	0	0.0046	0	0	0	4.5E-09	3.7E+01	0.00000000012
Diesel Range Organics	92,650	98,654	46	4,836	0	na	na	na
Diesel Range Organics, Aliphatic	74,120	78,923	37	3,869	0	8.0E-02	4.3E-01	0.19
Diesel Range Organics, Aromatic	29,648	31,569	15	1,548	0	3.2E-02	4.3E-01	0.075
Gasoline Range Organics	120	220	0.57	32	0	na	na	na
Gasoline Range Organics, Aliphatic	84	154	0.40	23	0	1.6E-04	4.3E-01	0.00038
Gasoline Range Organics, Aromatic	60	110	0.28	16	0	1.2E-04	4.3E-01	0.00027
Residual Range Organics	2,073	3,634	0	2.8	0	na	na	na
Residual Range Organics, Aliphatic	1,866	3,271	0	2.5	0	3.23E-03	5.41E-01	0.0060
Residual Range Organics, Aromatic	622	1,090	0	1	0	1.08E-03	5.41E-01	0.0020
							Max HQ	**0.19**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.

TABLE H-30

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 28 - Drainage Basin
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-31

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 29 - Suqitughneq River
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Aluminum	0	0.040	0	5.3E-09	3.1E+00	0.0000000017
Barium	0	0.0050	0	6.6E-10	8.2E-01	0.00000000081
Silver/Dissolved	0	0.020	0	2.7E-09	3.3E-01	0.0000000082
Diesel Range Organics	0	0.16	0	na	na	na
Diesel Range Organics, Aliphatic	0	0.13	0	1.7E-08	8.0E+01	0.00000000021
Diesel Range Organics, Aromatic	0	0.064	0	8.5E-09	8.0E+01	0.00000000011
Gasoline Range Organics	0	0.29	0	na	na	na
Gasoline Range Organics, Aliphatic	0	0.20	0	2.70E-08	2.30E+01	0.0000000012
Gasoline Range Organics, Aromatic	0	0.15	0	1.93E-08	2.30E+01	0.00000000084
					Max HQ	**0.0000000082**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-32

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 29 - Suqitughneq River
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	0	0.040	0	0	8.7E-11	1.8E-01	0.00000000048
Barium	0	0.0050	0	0	1.1E-11	4.7E-02	0.00000000023
Silver/Dissolved	0	0.020	0	0	4.3E-11	1.9E-02	0.0000000023
Diesel Range Organics	0	0.160	0	0	na	na	na
Diesel Range Organics, Aliphatic	0	0.13	0	0	2.8E-10	4.6E+00	0.000000000060
Diesel Range Organics, Aromatic	0	0.064	0	0	1.4E-10	4.6E+00	0.000000000030
Gasoline Range Organics	0	0.29	0	0	na	na	na
Gasoline Range Organics, Aliphatic	0	0.20	0	0	4.40E-10	1.32E+00	0.00000000033
Gasoline Range Organics, Aromatic	0	0.15	0	0	3.14E-10	1.32E+00	0.00000000024
						Max HQ	**0.0000000023**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-33

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 29 - Suqitughneq River
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	0	15,900	0.040	0	0	1.6E-02	5.8E+01	0.00027
Antimony	0	0	0	0	0.0083	8.1E-08	1.1E+00	0.000000077
Arsenic	0	5.7	0	0	0.65	1.2E-05	1.1E+00	0.000011
Barium	0	115	0.0050	0	0.22	1.2E-04	1.1E+01	0.000010
Beryllium	0	1.1	0	0	0	1.1E-06	1.1E+01	0.00000010
Cadmium	0	0	0	0	0.021	2.1E-07	1.3E+00	0.00000016
Cobalt	0	7.0	0	0	0	6.9E-06	1.1E+00	0.0000062
Copper	0	0	0	0	1.7	1.7E-05	2.5E+01	0.00000066
Lead	0	0	0	0	0.0069	6.8E-08	2.1E+00	0.000000032
Manganese	0	114	0	0	0	1.1E-04	5.7E+02	0.00000020
Mercury, Dissolved	0	0.050	0	0	0.017	2.2E-07	2.6E-01	0.00000084
Nickel	0	0	0	0	0.49	4.8E-06	7.1E+01	0.000000068
Selenium	0	0	0	0	0.28	2.7E-06	4.6E-01	0.0000060
Silver/Dissolved	0	0	0.020	0	0.021	2.1E-07	1.6E+02	0.0000000013
Vanadium	0	35	0	0	0.082	3.5E-05	1.0E+01	0.0000035
Zinc	0	0	0	0	24	2.4E-04	1.4E+02	0.0000017
m,p-Xylene (Sum of Isomers)	0	0.0032	0	0	0	3.2E-09	na	na
2-Methylnaphthalene	0	0.072	0	0	0.0038	1.1E-07	5.4E-01	0.00000020
Acenaphthylene	0	0	0	0	0.0038	3.7E-08	5.4E-01	0.000000069
Anthracene	0	0.016	0	0	0.0041	5.6E-08	5.4E-01	0.000000103
Benzo(a)anthracene	0	0	0	0	0.0043	4.2E-08	4.3E-01	0.00000010
Benzo(a)pyrene	0	0	0	0	0.0037	3.6E-08	5.4E-01	0.000000067
Benzo(b)fluoranthene	0	0	0	0	0.0032	3.1E-08	5.4E-01	0.000000058
Benzo(g,h,i)perylene	0	0	0	0	0.0040	3.9E-08	5.4E-01	0.000000073
Benzo(k)fluoranthene	0	0	0	0	0.0057	5.6E-08	7.6E-02	0.00000074
Chrysene	0	0	0	0	0.0044	4.3E-08	5.4E-01	0.000000080
Dibenzo(a,h)anthracene	0	0	0	0	0.0032	3.1E-08	2.1E-01	0.00000015
Fluoranthene	0	0	0	0	0.0047	4.6E-08	5.4E-01	0.000000085
Fluorene	0	0.020	0	0	0.0043	6.2E-08	5.4E-01	0.000000115

TABLE H-33

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 29 - Suqitughneq River
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Indeno(1,2,3-cd)pyrene	0	0	0	0	0.0026	2.6E-08	5.4E-01	0.000000047
Naphthalene	0	0.031	0	0	0.0032	6.2E-08	4.3E-01	0.00000014
Phenanthrene	0	0.025	0	0	0.0048	7.2E-08	5.4E-01	0.00000013
Pyrene	0	0.016	0	0	0.0050	6.5E-08	5.4E-01	0.00000012
PCB-1254 (Aroclor 1254)	0	0	0	0	0.019	1.9E-07	1.6E-01	0.0000012
PCB-1260 (Aroclor 1260)	0	0	0	0	0.012	1.2E-07	2.0E-01	0.00000059
Diesel Range Organics	0	1,859	0.16	0	0	na	na	na
Diesel Range Organics, Aliphatic	0	1,487	0.13	0	0	1.5E-03	4.3E-01	0.0034
Diesel Range Organics, Aromatic	0	744	0.064	0	0	7.3E-04	4.3E-01	0.0017
Gasoline Range Organics	0	0	0.29	0	0	na	na	na
Gasoline Range Organics, Aliphatic	0	0	0.20	0	0	1.9E-12	4.3E-01	0.0000000000045
Gasoline Range Organics, Aromatic	0	0	0.15	0	0	1.4E-12	4.3E-01	0.0000000000032
Residual Range Organics	0	1,000	0	0	0	na	na	na
Residual Range Organics, Aliphatic	0	900	0	0	0	8.88E-04	5.41E-01	0.0016
Residual Range Organics, Aromatic	0	300	0	0	0	2.96E-04	5.41E-01	0.0005
							Max HQ	**0.0034**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-34

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Antimony	0	0	0.0030	5.9E-04	4.2E+00	0.00014
Arsenic	0	0	1.6	3.1E-01	4.9E+00	0.064
Barium	0	0.0050	40	7.8E+00	8.2E-01	9.6
Beryllium	1.5	0	0.0018	7.4E-03	1.1E+00	0.0070
Cadmium	0	0	0.47	9.2E-02	1.6E+00	0.057
Chromium	0	0.015	24	4.6E+00	5.6E+00	0.82
Copper	0	0.040	3.6	7.0E-01	2.5E+01	0.028
Lead or Lead Dissolved	0	0.86	11	2.2E+00	1.3E+01	0.17
Mercury or Mercury Dissolved	0	0	0.11	2.1E-02	2.1E+00	0.010
Nickel	0	0	3.4	6.7E-01	8.0E+01	0.0083
Selenium	0	0	0.23	4.5E-02	6.6E-02	0.68
Silver	0	0.020	0.033	6.4E-03	3.3E-01	0.020
Vanadium	0	0	6.8	1.3E+00	3.4E+00	0.39
Zinc	0	0.62	58	1.1E+01	9.0E+00	1.3
Zinc, Dissolved	0	0.23	0.00	3.1E-08	9.0E+00	0.0000000034
2-Methylnaphthalene	0	0	0.012	2.3E-03	8.7E+01	0.000027
Acenaphthene	0	0	0.029	5.7E-03	8.7E+01	0.000065
Anthracene	1.1	0	0.013	7.7E-03	8.7E+01	0.000089
Benzo(a)anthracene	4.4	0	0.088	3.8E-02	1.5E+02	0.00026
Benzo(a)pyrene	2.3	0	0.11	3.2E-02	8.7E+01	0.00037
Benzo(b)fluoranthene	2.6	0	0.089	3.0E-02	8.7E+01	0.00034
Benzo(g,h,i)perylene	0	0	0.055	1.1E-02	8.7E+01	0.00012
Benzo(k)fluoranthene	2.7	0	0.20	5.2E-02	8.7E+01	0.00060
Chrysene	5.5	0	0.18	6.1E-02	8.7E+01	0.00070
Fluoranthene	0.89	0	0.73	1.5E-01	8.7E+01	0.0017

TABLE H-34

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Fluorene	0	0	0.027	5.3E-03	8.7E+01	0.000061
Indeno(1,2,3-cd)pyrene	0	0	0.11	2.2E-02	8.7E+01	0.00025
Naphthalene	0	0	0.015	2.9E-03	8.0E+01	0.000037
Phenanthrene	4.1	0	0.59	1.3E-01	8.7E+01	0.0015
Pyrene	7.5	0	0.53	1.4E-01	8.7E+01	0.0016
PCB-1254 (Aroclor 1254)	0.47	0	3.0	5.9E-01	2.9E-01	2.0
PCB-1260 (Aroclor 1260)	0	0.00081	0.61	1.2E-01	2.9E-01	0.41
Diesel Range Organics	92,650	46	4,836	na	na	na
Diesel Range Organics, Aliphatic	74,120	37	3,869	1.1E+03	8.0E+01	14
Diesel Range Organics, Aromatic	37,060	18	1,934	5.5E+02	8.0E+01	6.9
Gasoline Range Organics	120	0.57	32	na	na	na
Gasoline Range Organics, Aliphatic	84	0.40	23	4.84E+00	2.30E+01	0.21
Gasoline Range Organics, Aromatic	60	0.28	16	3.46E+00	2.30E+01	0.15
Residual Range Organics	2,073	0	2.8	na	na	na
Residual Range Organics, Aliphatic	1,866	0	2.5	9.25E+00	8.69E+01	0.11
Residual Range Organics, Aromatic	622	0	0.83	3.08E+00	8.69E+01	0.035
					Max HQ	**14**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-35

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Antimony	0	0	0.0030	0.0000030	8.1E-07	2.4E-01	0.0000033
Arsenic	0	0	1.6	0.0032	4.3E-04	2.8E-01	0.0015
Barium	0	0.0050	40	0.0060	1.1E-02	4.7E-02	0.23
Beryllium	1.5	0	0.0018	0.0015	1.2E-04	6.1E-02	0.0019
Cadmium	0	0	0.47	0.00026	1.3E-04	9.3E-02	0.0014
Chromium	0	0.015	24	0.13	6.6E-03	3.2E-01	0.020
Copper	0	0.040	3.6	0.036	1.0E-03	1.4E+00	0.00072
Lead/Dissolved	0	0.86	11	0.0033	2.9E-03	7.4E-01	0.0040
Mercury/Dissolved	0	0	0.11	0.027	9.4E-05	1.2E-01	0.00078
Nickel	0	0	3.4	0.020	9.5E-04	4.6E+00	0.00021
Selenium	0	0	0.23	0.0035	7.0E-05	3.8E-03	0.018
Silver	0	0.020	0.033	0.00010	9.0E-06	1.9E-02	0.00048
Vanadium	0	0	6.8	0.017	1.9E-03	1.9E-01	0.0095
Zinc	0	0.62	58	5.8	2.9E-02	5.2E-01	0.056
Zinc/Dissolved	0	0.23	0	0	1.0E-09	5.2E-01	0.0000000019
2-Methylnaphthalene	0	0	0.012	0.000000042	3.2E-06	5.0E+00	0.00000064
Acenaphthene	0	0	0.029	0.000000062	7.7E-06	5.0E+00	0.0000015
Anthracene	1.1	0	0.013	0.00000029	8.6E-05	5.0E+00	0.000017
Benzo(a)anthracene	4.4	0	0.088	0.000024	3.5E-04	8.4E+00	0.000042
Benzo(a)pyrene	2.3	0	0.11	0.000058	2.0E-04	5.0E+00	0.0000
Benzo(b)fluoranthene	2.6	0	0.089	0.000062	2.2E-04	5.0E+00	0.000043
Benzo(g,h,i)perylene	0	0	0.055	0.000071	1.5E-05	5.0E+00	0.0000030
Benzo(k)fluoranthene	2.7	0	0.20	0.00011	2.5E-04	5.0E+00	0.000051
Chrysene	5.5	0	0.18	0.000044	4.6E-04	5.0E+00	0.000091
Dibenzo(a,h)anthracene	0	0	0.014	0.000013	3.8E-06	1.9E-01	0.000020
Fluoranthene	0.89	0	0.73	0.000023	2.6E-04	5.0E+00	0.000052

TABLE H-35

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Fluorene	0	0	0.027	0.00000010	7.2E-06	5.0E+00	0.0000014
Indeno(1,2,3-cd)pyrene	0	0	0.11	0.00023	3.0E-05	5.0E+00	0.0000060
Naphthalene	0	0	0.015	0.000000009	4.0E-06	4.6E+00	0.00000086
Phenanthrene	4.1	0	0.59	0.0000063	4.6E-04	5.0E+00	0.000092
Pyrene	7.5	0	0.53	0.000018	7.0E-04	5.0E+00	0.00014
PCB-1254 (Aroclor 1254)	0.5	0	3.0	0.0013	8.4E-04	1.7E-02	0.050
PCB-1260 (Aroclor 1260)	0	0.00081	0.61	0.00025	1.6E-04	1.7E-02	0.0097
Diesel Range Organics	92,650	46	4,836	0.0043	na	na	na
Diesel Range Organics, Aliphatic	74,120	37	3,869	0.0034	6.6E+00	4.6E+00	1.4
Diesel Range Organics, Aromatic	37,060	18	1,934	0.0017	3.3E+00	4.6E+00	0.71
Gasoline Range Organics	120	0.57	32	0.0000012	na	na	na
Gasoline Range Organics, Aliphatic	84	0.40	23	0.00000087	1.23E-02	1.32E+00	0.0093
Gasoline Range Organics, Aromatic	60	0.28	16	0.00000062	8.80E-03	1.32E+00	0.0066
Residual Range Organics	2,073	0	2.8	0.018	na	na	na
Residual Range Organics, Aliphatic	1,866	0	2.5	0.016	1.40E-01	5.01E+00	0.028
Residual Range Organics, Aromatic	622	0	0.83	0.0055	4.66E-02	5.01E+00	0.0093
						Max HQ	**1.4**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-36

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Aluminum	0	15,900	0.040	0	0	3.1E-02	5.8E+01	0.00055
Antimony	0	0	0	0.0030	0.0083	1.7E-07	1.1E+00	0.00000016
Arsenic	0	5.7	0	1.6	0.65	2.6E-05	1.1E+00	0.000024
Barium	0	115	0.0050	40	1.1	2.9E-04	1.1E+01	0.000026
Beryllium	1.5	0	0	0.0018	0	1.9E-09	1.1E+01	0.00000000017
Cadmium	0	0	0	0.47	0.0080	6.4E-07	1.3E+00	0.00000048
Chromium	0	28	0.015	24	0	8.0E-05	9.7E-01	0.000082
Cobalt	0	7.0	0	0	0	1.4E-05	1.1E+00	0.0000123
Copper	0	0	0.040	3.6	1.7	3.7E-05	2.5E+01	0.00000146
Lead/Dissolved	0	7.4	0.86	11	0.028	2.7E-05	2.1E+00	0.0000125
Manganese	0	114	0.11	0	0	2.2E-04	5.7E+02	0.00000040
Mercury/Dissolved	0	0.050	0	0.11	0.098	2.1E-06	2.6E-01	0.0000083
Nickel	0	0	0	3.4	1.1	2.5E-05	7.1E+01	0.00000035
Selenium	0	0	0	0.23	0.28	5.7E-06	4.6E-01	0.000012
Silver, Dissolved	0	0	0.020	0.033	0.02	4.5E-07	1.6E+02	0.0000000027
Vanadium	0	35	0	6.8	0.11	7.8E-05	1.0E+01	0.0000078
Zinc	0	26	0.62	58	51	1.1E-03	1.4E+02	0.0000079
Zinc/Dissolved	0	0	0.23	0	0	4.3E-12	1.4E+02	0.000000000000031
Ethylbenzene	0	1.8	0	0	0	3.6E-06	na	na
m,p-Xylene (Sum of Isomers)	0	0.0032	0	0	0	6.3E-09	na	na
Toluene	0	0.050	0	0	0	9.9E-08	na	na
Xylenes	0	0.78	0	0	0	1.5E-06	na	na
Dibenzofuran	0	4.5	0	0	0	9.0E-06	1.1E-01	0.000084
2-Methylnaphthalene	0	500	0	0.012	0.19	9.9E-04	5.4E-01	0.0018
Acenaphthene	0	14	0	0.029	0.026	2.8E-05	5.4E-01	0.000052
Acenaphthylene	0	0.047	0	0	0	9.2E-08	5.4E-01	0.00000017
Anthracene	1.1	1.8	0	0.013	0.0041	3.6E-06	5.4E-01	0.0000067
Benzo(a)anthracene	4.4	1.5	0	0.088	0.0043	3.2E-06	4.3E-01	0.0000075
Benzo(a)pyrene	2	1.4	0	0.11	0.0047	2.9E-06	5.4E-01	0.0000053

TABLE H-36

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Benzo(b)fluoranthene	2.6	1.5	0	0.089	0.0032	3.1E-06	5.4E-01	0.0000057
Benzo(g,h,i)perylene	0	0.9	0	0.055	0.0043	1.9E-06	5.4E-01	0.0000036
Benzo(k)fluoranthene	2.7	1.5	0	0.20	0.0057	3.3E-06	7.6E-02	0.000043
Chrysene	5.5	1.8	0	0.18	0.0044	3.8E-06	5.4E-01	0.0000071
Dibenzo(a,h)anthracene	0	0.015	0	0.014	0.0032	1.1E-07	2.1E-01	0.00000051
Fluoranthene	0.89	2.8	0	0.73	0.0047	6.3E-06	5.4E-01	0.000012
Fluorene	0	20	0	0.027	0.067	4.1E-05	5.4E-01	0.000075
Indeno(1,2,3-cd)pyrene	0	1.2	0	0.11	0.0026	2.5E-06	5.4E-01	0.0000047
Naphthalene	0	175	0	0.015	0.068	3.5E-04	4.3E-01	0.00081
Phenanthrene	4.1	21	0	0.59	0.018	4.2E-05	5.4E-01	0.000078
Pyrene	7.5	9.5	0	0.53	0.0050	1.9E-05	5.4E-01	0.000036
PCB-1242 (Aroclor 1242)	0	0.10	0	0	0	2.0E-07	2.6E-01	0.00000076
PCB-1254 (Aroclor 1254)	0.47	0.16	0	3.0	0.0050	3.5E-06	1.6E-01	0.000023
PCB-1260 (Aroclor 1260)	0	0.52	0.0	0.61	0.14	4.4E-06	2.0E-01	0.000022
4,4'-DDD	0	1.2	0	0	0	2.3E-06	4.8E+02	0.0000000048
beta-BHC	0	0.010	0	0	0	2.0E-08	5.2E+00	0.0000000038
Endosulfan sulfate	0	0.0086	0	0	0	1.7E-08	7.3E+00	0.0000000023
gamma-BHC (Lindane)	0	0.0065	0	0	0	1.3E-08	5.2E+00	0.0000000025
Heptachlor	0	0.0046	0	0	0	9.1E-09	3.7E+01	0.00000000024
Diesel Range Organics	92,650	98,654	46	4,836	0	na	na	na
Diesel Range Organics, Aliphatic	74,120	78,923	37	3,869	0	1.6E-01	4.3E-01	0.37
Diesel Range Organics, Aromatic	37,060	39,462	18	1,934	0	8.0E-02	4.3E-01	0.19
Gasoline Range Organics	120	220	0.57	32	0	na	na	na
Gasoline Range Organics, Aliphatic	84	154	0.40	23	0	3.3E-04	4.3E-01	0.00077
Gasoline Range Organics, Aromatic	60	110	0.28	16	0	2.3E-04	4.3E-01	0.00055
Residual Range Organics	2,073	3,634	0	2.8	0	na	na	na
Residual Range Organics, Aliphatic	1,866	3,271	0	2.5	0	6.46E-03	5.41E-01	0.012
Residual Range Organics, Aromatic	622	1,090	0	0.83	0	2.15E-03	5.41E-01	0.0040
							Max HQ	**0.37**

TABLE H-36

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Sites 28 & 29 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-37

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 31 - White Alice Site
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Barium	0	0.0030	0	4.0E-10	8.2E-01	0.00000000049
Manganese	0	0.0050	0	6.6E-10	1.4E+02	0.0000000000047
PCB-1260 (Aroclor 1260)	22	0	0.026	1.1E-01	2.9E-01	0.37
Diesel Range Organics	8,307	0	434	na	na	na
Diesel Range Organics, Aliphatic	6,646	0	347	9.9E+01	8.0E+01	1.2
Diesel Range Organics, Aromatic	3,323	0	173	5.0E+01	8.0E+01	0.62
Residual Range Organics	2,165	0	2.9	na	na	na
Residual Range Organics, Aliphatic	1,949	0	2.6	9.66E+00	8.69E+01	0.11
Residual Range Organics, Aromatic	650	0	0.86	3.22E+00	8.69E+01	0.04
					Max HQ	**1.2**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-38

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 31 - White Alice Site
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Barium	0	0.0030	0	0	8.7E-13	4.7E-02	0.000000000018
Manganese	0	0.0050	0	0	1.5E-12	8.2E+00	0.00000000000018
PCB-1260 (Aroclor 1260)	22	0	0.026	0.00023	1.1E-04	1.7E-02	0.0065
Diesel Range Organics	8,307	0	434	0.00039	na	na	na
Diesel Range Organics, Aliphatic	6,646	0	347	0.00031	3.9E-02	4.6E+00	0.0085
Diesel Range Organics, Aromatic	3,323	0	173	0.00015	2.0E-02	4.6E+00	0.0043
Residual Range Organics	2,165	0	2.9	0.019	na	na	na
Residual Range Organics, Aliphatic	1,949	0	2.6	0.017	9.78E-03	5.01E+00	0.0020
Residual Range Organics, Aromatic	650	0	0.86	0.0057	3.26E-03	5.01E+00	0.00065
						Max HQ	**0.0085**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-39

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 31 - White Alice Site
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Barium	0	0	0.0030	0	0	3.8E-15	1.1E+01	0.00000000000000034
Manganese	0	0	0.0050	0	0	6.3E-15	5.7E+02	0.000000000000000011
PCB-1260 (Aroclor 1260)	22	0	0	0.026	0	1.8E-09	2.0E-01	0.0000000091
Diesel Range Organics	8,307	0	0	434	0	na	na	na
Diesel Range Organics, Aliphatic	6,646	0	0	347	0	2.4E-05	4.3E-01	0.000056
Diesel Range Organics, Aromatic	3,323	0	0	173	0	1.2E-05	4.3E-01	0.000028
Residual Range Organics	2,165	0	0	2.9	0	na	na	na
Residual Range Organics, Aliphatic	1,949	0	0	2.6	0	1.79E-07	5.41E-01	0.00000033
Residual Range Organics, Aromatic	650	0	0	0.86	0	5.98E-08	5.41E-01	0.00000011
							Max HQ	**0.000056**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-40

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 32 - Lower Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
PCB-1260 (Aroclor 1260)	0.89	0	0.0011	4.4E-03	2.9E-01	0.015
Diesel Range Organics	13,000	0	679	na	na	na
Diesel Range Organics, Aliphatic	10,400	0	543	1.6E+02	8.0E+01	1.9
Diesel Range Organics, Aromatic	5,200	0	271	7.8E+01	8.0E+01	0.97
Residual Range Organics	3,600	0	4.8	na	na	na
Residual Range Organics, Aliphatic	3,240	0	4.3	1.61E+01	8.69E+01	0.18
Residual Range Organics, Aromatic	1,080	0	1.4	5.35E+00	8.69E+01	0.062
					Max HQ	**1.9**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-41

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 32 - Lower Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1260 (Aroclor 1260)	0.89	0	0.0011	0.0000093	1.7E-06	1.7E-02	0.00010
Diesel Range Organics	13,000	0	679	0.00060	na	na	na
Diesel Range Organics, Aliphatic	10,400	0	543	0.00048	2.4E-02	4.6E+00	0.0051
Diesel Range Organics, Aromatic	5,200	0	271	0.00024	1.2E-02	4.6E+00	0.0026
Residual Range Organics	3,600	0	4.8	0.032	na	na	na
Residual Range Organics, Aliphatic	3,240	0	4.3	0.029	6.29E-03	5.01E+00	0.0013
Residual Range Organics, Aromatic	1,080	0	1.4	0.010	2.10E-03	5.01E+00	0.00042
						Max HQ	**0.0051**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-42

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 32 - Lower Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1260 (Aroclor 1260)	0.89	0	0	0.0011	0	2.9E-11	2.0E-01	0.00000000014
Diesel Range Organics	13,000	0	0	679	0	na	na	na
Diesel Range Organics, Aliphatic	10,400	0	0	543	0	1.5E-05	4.3E-01	0.000034
Diesel Range Organics, Aromatic	5,200	0	0	271	0	7.3E-06	4.3E-01	0.000017
Residual Range Organics	3,600	0	0	4.8	0	na	na	na
Residual Range Organics, Aliphatic	3,240	0	0	4.3	0	1.15E-07	5.41E-01	0.00000021
Residual Range Organics, Aromatic	1,080	0	0	1.4	0	3.84E-08	5.41E-01	0.000000071
							Max HQ	**0.000034**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-43

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 33 - Upper Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
Diesel Range Organics	660	0	34	na	na	na
Diesel Range Organics, Aliphatic	528	0	28	7.9E+00	8.0E+01	0.098
Diesel Range Organics, Aromatic	264	0	14	3.9E+00	8.0E+01	0.049
Residual Range Organics	2,100	0	2.8	na	na	na
Residual Range Organics, Aliphatic	1,890	0	2.5	9.37E+00	8.69E+01	0.11
Residual Range Organics, Aromatic	630	0	0.84	3.12E+00	8.69E+01	0.04
					Max HQ	**0.11**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-44

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 33 - Upper Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Diesel Range Organics	660	0	34	0.00	na	na	na
Diesel Range Organics, Aliphatic	528	0	28	0.00	1.3E-03	4.6E+00	0.00029
Diesel Range Organics, Aromatic	264	0	14	0.00	6.7E-04	4.6E+00	0.00015
Residual Range Organics	2,100	0	2.8	0.02	na	na	na
Residual Range Organics, Aliphatic	1,890	0	2.5	0.02	4.08E-03	5.01E+00	0.00081
Residual Range Organics, Aromatic	630	0	0.84	0.01	1.36E-03	5.01E+00	0.00027
						Max HQ	**0.00081**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-45

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 33 - Upper Tram Terminal
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
Diesel Range Organics	660	0	0	34	0	na	na	na
Diesel Range Organics, Aliphatic	528	0	0	28	0	8.2E-07	4.3E-01	0.0000019
Diesel Range Organics, Aromatic	264	0	0	14	0	4.1E-07	4.3E-01	0.0000010
Residual Range Organics	2,100	0	0	2.8	0	na	na	na
Residual Range Organics, Aliphatic	1,890	0	0	2.5	0	7.49E-08	5.41E-01	0.00000014
Residual Range Organics, Aromatic	630	0	0	0.84	0	2.50E-08	5.41E-01	0.000000046
							Max HQ	**0.0000019**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-46

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Site 34 - Upper Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
PCB-1254 (Aroclor 1254)	0.59	0	0.00071	2.9E-03	2.9E-01	0.010
PCB-1260 (Aroclor 1260)	0.47	0	0.00056	2.3E-03	2.9E-01	0.008
Diesel Range Organics	1,100	0	57	na	na	na
Diesel Range Organics, Aliphatic	880	0	46	1.3E+01	8.0E+01	0.16
Diesel Range Organics, Aromatic	440	0	23	6.6E+00	8.0E+01	0.082
Residual Range Organics	1,162	0	1.5	na	na	na
Residual Range Organics, Aliphatic	1,046	0	1.4	5.18E+00	8.69E+01	0.060
Residual Range Organics, Aromatic	349	0	0.46	1.73E+00	8.69E+01	0.020
					Max HQ	**0.16**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-47

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Site 34 - Upper Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1254 (Aroclor 1254)	0.59	0	0.00071	0.0000062	4.3E-06	1.7E-02	0.00026
PCB-1260 (Aroclor 1260)	0.47	0	0.00056	0.0000049	3.4E-06	1.7E-02	0.00020
Diesel Range Organics	1,100	0	57	0.00005	na	na	na
Diesel Range Organics, Aliphatic	880	0	46	0.0000	7.6E-03	4.6E+00	0.0016
Diesel Range Organics, Aromatic	440	0	23	0.000020	3.8E-03	4.6E+00	0.00082
Residual Range Organics	1,162	0	1.5	0.010	na	na	na
Residual Range Organics, Aliphatic	1,046	0	1.4	0.0092	7.68E-03	5.01E+00	0.0015
Residual Range Organics, Aromatic	349	0	0.46	0.0031	2.56E-03	5.01E+00	0.00051
						Max HQ	**0.0016**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-48

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Site 34 - Upper Camp
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1254 (Aroclor 1254)	0.59	0	0	0.00071	0	7.2E-11	1.6E-01	0.00000000046
PCB-1260 (Aroclor 1260)	0.47	0	0	0.00056	0	5.7E-11	2.0E-01	0.00000000029
Diesel Range Organics	1,100	0	0	57	0	na	na	na
Diesel Range Organics, Aliphatic	880	0	0	46	0	4.6E-06	4.3E-01	0.000011
Diesel Range Organics, Aromatic	440	0	0	23	0	2.3E-06	4.3E-01	0.0000054
Residual Range Organics	1,162	0	0	1.5	0	na	na	na
Residual Range Organics, Aliphatic	1,046	0	0	1.4	0	1.41E-07	5.41E-01	0.00000026
Residual Range Organics, Aromatic	349	0	0	0.46	0	4.69E-08	5.41E-01	0.00000009
							Max HQ	**0.000011**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-49

ECOLOGICAL HAZARD CALCULATIONS FOR TUNDRA VOLE
Sites 33 & 34 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard HQ
PCB-1254 (Aroclor 1254)	0.59	0	0.00071	2.9E-03	2.9E-01	0.010
PCB-1260 (Aroclor 1260)	0.47	0	0.00056	2.3E-03	2.9E-01	0.008
Diesel Range Organics	1,100	0	57	na	na	na
Diesel Range Organics, Aliphatic	880	0	46	1.3E+01	8.0E+01	0.16
Diesel Range Organics, Aromatic	440	0	23	6.6E+00	8.0E+01	0.082
Residual Range Organics	2,100	0	2.8	na	na	na
Residual Range Organics, Aliphatic	1,890	0	2.5	9.37E+00	8.69E+01	0.108
Residual Range Organics, Aromatic	630	0	0.84	3.12E+00	8.69E+01	0.036
					Max HQ	**0.16**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-50

ECOLOGICAL HAZARD CALCULATIONS FOR CROSS FOX
Sites 33 & 34 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	C_{HERB} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1254 (Aroclor 1254)	0.59	0	0.00071	0.0000062	5.6E-06	1.7E-02	0.00033
PCB-1260 (Aroclor 1260)	0.47	0	0.00056	0.0000049	4.5E-06	1.7E-02	0.00026
Diesel Range Organics	1,100	0	57	0.00005	na	na	na
Diesel Range Organics, Aliphatic	880	0	46	0.0000	9.9E-03	4.6E+00	0.0021
Diesel Range Organics, Aromatic	440	0	23	0.000020	4.9E-03	4.6E+00	0.0011
Residual Range Organics	2,100	0	2.8	0.019	na	na	na
Residual Range Organics, Aliphatic	1,890	0	2.5	0.0167	1.80E-02	5.01E+00	0.0036
Residual Range Organics, Aromatic	630	0	0.84	0.0056	5.99E-03	5.01E+00	0.0012
						Max HQ	**0.0036**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

TABLE H-51

ECOLOGICAL HAZARD CALCULATIONS FOR GLAUCOUS-WINGED GULL
Sites 33 & 34 Combined
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA

COPEC	Exposure Point Concentration C_{SOIL} (mg/kg)	Exposure Point Concentration $C_{SEDIMENT}$ (mg/kg)	Exposure Point Concentration C_{WATER} (mg/L)	Exposure Point Concentration C_{PLANT} (mg/kg)	Exposure Point Concentration C_{FISH} (mg/kg)	Ingestion Dose (mg/kg)	Toxicity Reference Value (mg/kg-day)	Ecological Hazard
PCB-1254 (Aroclor 1254)	0.59	0	0	0.00071	0	9.3E-11	1.6E-01	0.00000000060
PCB-1260 (Aroclor 1260)	0.47	0	0	0.00056	0	7.4E-11	2.0E-01	0.00000000037
Diesel Range Organics	1,100	0	0	57	0	na	na	na
Diesel Range Organics, Aliphatic	880	0	0	46	0	6.0E-06	4.3E-01	0.000014
Diesel Range Organics, Aromatic	440	0	0	23	0	3.0E-06	4.3E-01	0.0000070
Residual Range Organics	2,100	0	0	2.8	0	na	na	na
Residual Range Organics, Aliphatic	1,890	0	0	2.5	0	3.29E-07	5.41E-01	0.00000061
Residual Range Organics, Aromatic	630	0	0	0.84	0	1.10E-07	5.41E-01	0.00000020
							Max HQ	**0.000014**

Notes:
HQ - Hazard Quotient
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
mg/kg - d - Milligrams per kilogram per day.
na - not applicable
PCB - Polychlorinated Biphenyls.

APPENDIX I

Exposure Point Concentrations for Environmental Media

Table I-1
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 3

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Lead	3	3	119	27	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	119
Methylene chloride	1	1	0.0093	0.0093	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0093
Naphthalene	4	1	51	<0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	51
DRO	6	5	3,760	<0.0549	1,420	1,419	1.0	Normal	na	0.92	0.66	Normal	2,587	2,587
Subsurface Water COPC														
DRO	4	4	14	1.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	14
RRO	3	3	8.1	1.3	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	8.1

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
na - Not applicable.
mg/kg - milligrams per kilogram
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-2
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 4

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Lead	2	2	160	7.4	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	160
DRO	4	3	5,300	150	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5,300
RRO	1	1	3,420	3,420	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3,420
Subsurface Water COPC														
DRO	4	4	3.7	0.96	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.7
RRO	3	3	6.5	2.6	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	6.5

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-3
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 6

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Aluminum	2	2	9,850	7,790	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	9,850
Beryllium	13	3	1.3	0.60	0.64	1.1	0.55	Inconclusive	na	0.60	0.80	Normal	1.4	1.3
Cobalt	2	2	5.1	2.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5.1
Manganese	2	2	164	72.7	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	164
m,p-Xylene	5	2	0.044	<0.005	0.018	0.011	1.7	Inconclusive	na [a]	0.70	0.77	Lognormal	0.52	0.044
Methylene chloride	3	3	0.0079	0.0044	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0079
o-Xylene	5	2	0.014	<0.005	0.0054	0.0045	1.2	Lognormal	na [a]	0.66	0.84	Lognormal	0.049	0.014
DRO	17	17	102,000	12	27,008	16,359	1.7	Lognormal	na	0.66	0.94	Lognormal	14,716,131	102,000
RRO	6	6	8,500	220	3,127	3,200	1.0	Inconclusive	na	0.90	0.96	Lognormal	122,317	8,500

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-4
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 7

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r2	Lognormal r2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Aluminum	5	5	12,000	3,640	3,522	9,888	0.36	Inconclusive	na	0.65	0.61	Normal	13,246	12,000
Arsenic	18	18	50	2.0	12.32	9.3	1.3	Lognormal	na	0.58	0.84	Lognormal	15	15
Cadmium	19	9	4.1	1.0	2.5	2.5	1.0	Inconclusive	na	0.61	0.78	Lognormal	3.4	3.4
Chromium	19	18	100	5.0	27	27	1.0	Lognormal	na	0.70	0.91	Lognormal	43	43
Cobalt	5	5	19	2.0	8.3	12	0.71	Inconclusive	na	0.83	0.83	Lognormal	258	19
Lead	20	20	460	10	143	96	1.5	Inconclusive	na	0.62	0.86	Lognormal	196	196
Manganese	5	5	694	55	294	382	0.77	Inconclusive	na	0.87	0.82	Normal	662	662
Mercury	18	4	0.56	0.10	0.18	0.17	1.1	Inconclusive	na	0.80	0.82	Lognormal	0.31	0.31
Nickel	19	16	280	5.0	62	30.0	2.1	Lognormal	na	0.39	0.90	Lognormal	50	50
Thallium	2	2	1.2	0.28	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.2
1,1,1-Trichloroethane	10	3	0.28	<0.0053	0.10	0.072	1.4	Inconclusive	na	0.79	0.86	Lognormal	4.7	0.28
Acetone	10	4	1.4	<0.011	0.50	0.36	1.4	Lognormal	na	0.77	0.90	Lognormal	105	1.4
Bromoethane	10	5	0.40	<0.0053	0.13	0.11	1.3	Inconclusive	na	0.82	0.81	Normal	0.18	0.18
m,p-Xylene	10	1	0.13	<0.0053	0.047	0.039	1.2	Inconclusive	na	0.84	0.85	Normal	0.066	0.066
Methylene chloride	9	4	0.013	<0.0058	0.11	0.086	1.3	Lognormal	na	0.79	0.92	Lognormal	2.7	0.13
4-Methylphenol (p-Cresol)	14	3	3.9	<0.33	6.4	2.7	2.4	Inconclusive	na	0.41	0.86	Lognormal	13	3.9
PCB-1260 (Aroclor 1260)	22	4	13	<0.05	2.8	0.8	3.5	Inconclusive	na	0.30	0.81	Lognormal	1.6	1.6
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	13	4	0.00052	0.0000011	0.00019	0.000084	2.3	Inconclusive	na	0.46	0.88	Lognormal	0.031	0.00052
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	13	12	0.020	0.00000091	0.0055	0.0016	3.4	Lognormal	na	0.30	0.96	Lognormal	1.54	0.020
1,2,3,4,6,7,8-Heptachlorodibenzofuran	12	4	0.00016	0.00000043	0.000046	0.000016	2.9	Inconclusive	na	0.37	0.80	Lognormal	0.00094	0.00016
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	13	8	0.0011	0.00000047	0.00030	0.00010	3.2	Lognormal	na	0.33	0.88	Lognormal	0.017	0.0011
1,2,3,4,7,8,9-Heptachlorodibenzofuran	13	1	0.0000013	0.0000013	0.0000019	0.0000011	1.7	Lognormal	na	0.58	0.88	Lognormal	0.000004	0.0000013
1,2,3,4,7,8-Hexachlorodibenzofuran	13	4	0.000027	0.00000012	0.0000002	1.2E-07	2.6	Inconclusive	na	0.40	0.85	Lognormal	0.00002	0.00002
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	13	1	0.0000020	<0.00000015	0.0000016	0.0000011	1.5	Lognormal	na	0.66	0.90	Lognormal	0.000015	0.000002
1,2,3,6,7,8-Hexachlorodibenzofuran	13	1	0.000011	<0.000000075	0.0000033	0.0000016	2.0	Inconclusive	na	0.54	0.88	Lognormal	0.000015	0.000011
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	13	4	0.000046	<0.000000145	0.000013	0.0000043	2.9	Inconclusive	na	0.35	0.84	Lognormal	0.00003	0.00003
1,2,3,7,8,9-Hexachlorodibenzofuran	13	1	0.00000040	<0.000000085	0.00000057	0.00000043	1.3	Lognormal	na	0.68	0.95	Lognormal	0.0000012	0.0000004
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	13	2	0.000031	0.0000051	0.0000088	0.0000036	2.5	Lognormal	na	0.43	0.88	Lognormal	0.000041	0.000031
1,2,3,7,8-Pentachlorodibenzofuran	13	1	0.0000045	<0.0000001	0.0000016	0.0000010	1.6	Inconclusive	na	0.66	0.87	Lognormal	0.0000056	0.0000045
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	13	1	0.0000015	<0.00000015	0.0000010	0.0000007	1.4	Inconclusive	na	0.67	0.92	Lognormal	0.0000020	0.0000015
2,3,4,6,7,8-Hexachlorodibenzofuran	13	8	0.000019	0.00000041	0.0000052	0.0000026	2.0	Inconclusive	na	0.50	0.83	Lognormal	0.0000089	0.0000089
2,3,4,7,8-Pentachlorodibenzofuran	13	1	0.000012	<0.00000008	0.0000035	0.0000018	2.0	Inconclusive	na	0.58	0.87	Lognormal	0.000016	0.000012
2,3,7,8-Tetrachlorodibenzofuran	13	6	0.000029	<0.0000002	0.0000086	0.0000037	2.3	Inconclusive	na	0.49	0.88	Lognormal	0.000031	0.000029
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TEQ) [b]	na	na	na	na	na	na	na	na	na	na	na	na	na	0.000043
Total Heptachlorodibenzofurans (HpCDF)	3	1	0.00053	<0.00001	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00053
Total Heptachlorodibenzo-p-dioxins (HpCDD)	3	2	0.0022	<0.0000185	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0022
Total Hexachlorodibenzofurans (HxCDF)	3	1	0.00019	<0.000004	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00019
Total Hexachlorodibenzo-p-dioxins (HxCDD)	3	1	0.00034	<0.0000061	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00034
Total Pentachlorodibenzofurans (PeCDF)	3	1	0.00011	<0.0000088	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00011
Total Tetrachlorodibenzofurans (TCDF)	3	1	0.00015	0.00015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00015
Soil COPC (continued)														

Table I-4
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 7

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r2	Lognormal r2	Assumed Distribution	95% UCL	EPC
Total Tetrachlorodibenzo-p-dioxins (TCDD)	3	1	0.000039	<0.0000069	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000039
Diesel Range Organics (DRO)	24	21	32,000	11	6,454	1,826	3.5	Lognormal	na	0.25	0.92	Lognormal	32,222	32,000
Residual Range Organics (RRO)	7	7	3,900	620	1,396	2,423	0.58	Inconclusive	na	0.91	0.86	Normal	3,448	3,448
Subsurface Water COPC														
Aluminum	3	3	26	11	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	26
Barium	3	3	0.13	0.13	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.13
Cobalt	3	3	0.064	0.004	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.064
Lead	4	4	0.04	0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.040
Manganese	3	3	0.593	0.060	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.59
Nickel	4	1	3.5	3.5	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.5
Zinc	4	3	2.5	0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2.5
Benzene	5	1	0.0021	0.0021	0.00072	0.00082	0.87	Inconclusive	na	na	na	na	na	0.0021
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	1	1	0.00000023	0.00000023	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00000023
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TEQ) [b]	na	na	na	na	na	na	na	na	na	na	na	na	na	0.000000000023
DRO	4	3	0.66	0.39	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.66
RRO	3	3	2.7	1.1	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2.7

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

[b] Toxicity Equivalent Factors (TEFs) and subsequent Toxicity Equivalent Quotients (TEQs) derived from Draft Dioxin Reassessment, USEPA 2000c (Table 9-2).

Table I-5
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 9

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Aluminum	5	1	0.0000036	0.0000036	3.5	4.9	0.72	Normal	na	0.88	0.57	Normal	8.3	0.0000036
Antimony	15	1	14	<10	8.7	13	0.68	Inconclusive	na	0.93	0.96	Lognormal	20	14
Arsenic	15	7	20	<0.6	5.2	4.0	1.3	Lognormal	na	0.69	0.91	Lognormal	17	17
Cadmium	15	4	7.0	0.75	2.1	2.2	0.98	Lognormal	na	0.78	0.94	Lognormal	4.1	4.1
Chromium	15	14	60	5.0	14	19	0.70	Lognormal	na	0.77	0.93	Lognormal	29	29
Cobalt	5	4	38	<2	15	11	1.4	Lognormal	na	0.65	0.91	Lognormal	717	38
Copper	15	15	429	6.0	106	53	2.0	Lognormal	na	0.40	0.89	Lognormal	98	98
Lead	15	14	630	<10	160	105	1.5	Lognormal	na	0.57	0.92	Lognormal	276	276
Manganese	5	5	970	51	380	302	1.3	Lognormal	na	0.67	0.93	Lognormal	1,626	970
Mercury	15	1	0.60	<0.1	0.15	0.13	1.1	Inconclusive	na	0.73	0.98	Lognormal	0.21	0.21
Nickel	15	11	110	<5	26	17	1.57	Inconclusive	na	0.40	0.82	Lognormal	27	27
Selenium	15	1	1.0	<5	9.0	6.0	1.49	Inconclusive	na	0.80	0.94	Lognormal	73	1.0
Thallium	2	1	0.28	0.28	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.28
Zinc	15	15	1,790	15	463	218	2.1	Inconclusive	na	0.44	0.84	Lognormal	459	459
1,1,1-Trichloroethane	8	1	0.2	<0.005	0.088	0.084	1.1	Normal	na	0.95	0.88	Normal	0.14	0.14
1,2-Dibromoethane	8	2	0.000010	0.0000097	0.078	0.045	1.7	Lognormal	na	0.68	0.92	Lognormal	2.06E+08	0.00001
1,3-Dichlorobenzene	15	7	0.068	0.00000025	0.074	0.055	1.3	Inconclusive	na	0.74	0.94	Normal	0.12	0.068
1,3-Dichloropropane	8	5	0.000097	0.0000070	0.031	0.012	2.6	Lognormal	na	0.43	0.97	Lognormal	87,851	0.000097
2,2-Dichloropropane	8	1	0.00000092	0.00000092	0.078	0.059	1.3	Inconclusive	na	0.82	0.83	Lognormal	8.76E+09	0.00000092
2-Chloroethyl vinyl ether	5	2	0.0000026	0.00000054	0.46	0.42	1.1	Normal	na	0.90	0.78	Normal	0.86	0.0000026
2-Chlorotoluene	8	2	0.0000045	0.0000013	0.045	0.031	1.5	Lognormal	na	nc	nc	nc	nc	0.0000045
2-Hexanone	5	2	0.0000087	0.0000078	0.23	0.23	1.0	Normal	na	0.87	0.75	Normal	0.45	0.0000087
4-Bromophenyl phenyl ether	10	2	0.0000024	0.0000012	0.38	0.33	1.1	Inconclusive	na	0.75	0.64	Normal	0.55	0.0000024
4-Chlorophenyl phenyl ether	10	2	0.0000029	0.00000064	0.44	0.39	1.1	Inconclusive	na	0.79	0.72	Normal	0.64	0.0000029
4-Isopropyltoluene	8	3	0.0000047	0.00000077	0.046	0.026	1.8	Lognormal	na	0.64	0.92	Lognormal	1.19E+15	0.0000047
Bromomethane	8	1	0.36	<0.005	0.13	0.10	1.2	Inconclusive	na	0.91	0.92	Lognormal	56	0.36
Toluene	16	2	6.0	<0.0025	1.5	0.42	3.5	Inconclusive	na	0.30	0.89	Normal	1.1	1.1
2-Methyl-4,6-dinitrophenol	10	3	0.0000037	0.00000022	1.5	1.2	1.3	Inconclusive	na	0.76	0.80	Lognormal	4.9E+26	0.0000037
3-Nitroaniline	10	2	0.0000019	0.0000008	1.5	1.5	1.0	Inconclusive	na	0.85	0.70	Normal	2.3	0.0000019
4-Chlorotoluene	8	4	0.025	0.00000043	0.077	0.032	2.4	Lognormal	na	0.47	0.94	Lognormal	5.76E+13	0.025
4-Nitroaniline	10	1	0.000030	0.000030	1.8	2.0	0.92	Inconclusive	na	0.91	0.60	Normal	3.0	0.000030
4-Nitrophenol	10	3	0.00013	0.0000088	1.5	1.2	1.3	Inconclusive	na	0.76	0.80	Lognormal	1.18E+14	0.00013
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	10	6	0.00012	0.0000038	0.000043	0.000030	1.4	Lognormal	na	0.71	0.96	Lognormal	0.00099	0.00012
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	10	9	0.0011	0.0000070	0.00036	0.00028	1.3	Lognormal	na	0.79	0.96	Lognormal	0.015	0.0011
1,2,3,4,6,7,8-Heptachlorodibenzofuran	10	7	0.000030	0.00000025	0.000011	0.0000080	1.4	Lognormal	na	0.73	0.96	Lognormal	0.00021	0.000030
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	10	8	0.00012	0.00000059	0.000045	0.000035	1.3	Lognormal	na	0.76	0.95	Lognormal	0.0016	0.00012
1,2,3,4,7,8,9-Heptachlorodibenzofuran	9	1	0.0000023	0.0000023	0.00000069	0.00000068	1.0	Lognormal	na	0.76	0.97	Lognormal	0.0000018	0.0000018
1,2,3,4,7,8-Hexachlorodibenzofuran	10	4	0.0000066	0.00000023	0.0000020	0.0000015	1.4	Lognormal	na	0.70	0.97	Lognormal	0.0000067	0.0000066
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	10	4	0.0000029	0.0000011	0.00000078	0.0000012	0.64	Inconclusive	na	0.88	0.87	Normal	0.0000017	0.0000017
1,2,3,6,7,8-Hexachlorodibenzofuran	10	2	0.0000016	0.0000014	0.00000066	0.00000071	0.93	Inconclusive	na	0.89	0.96	Lognormal	0.0000028	0.0000016
1,2,3,6,7,8-Hexachlorodibenzofuran-p-dioxin	9	2	0.0000045	0.00000059	0.00000150	0.00000130	1.1	Inconclusive	na	0.78	0.97	Lognormal	0.0000068	0.0000045
1,2,3,7,8,9-Hexachlorodibenzofuran	10	1	0.00000038	<0.00000008	0.00000055	0.00000043	1.3	Inconclusive	na	0.58	0.92	Lognormal	0.0000013	0.00000038
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	10	4	0.0000083	<0.0000004	0.0000025	0.0000020	1.2	Lognormal	na	0.70	0.97	Lognormal	0.0000079	0.0000079
1,2,3,7,8-Pentachlorodibenzofuran	10	3	0.0000021	0.00000022	0.00000063	0.00000065	0.98	Lognormal	na	0.81	0.95	Lognormal	0.0000019	0.0000019
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	9	1	0.00000035	0.00000035	0.00000013	0.00000033	0.39	Inconclusive	na	0.94	0.98	Lognormal	0.00000045	0.00000035
2,3,4,6,7,8-Hexachlorodibenzofuran	10	4	0.0000032	0.00000080	0.0000010	0.0000010	1.0	Lognormal	na	0.84	0.97	Lognormal	0.0000029	0.0000029
2,3,4,7,8-Pentachlorodibenzofuran	10	3	0.0000025	<0.0000002	0.00000074	0.00000068	1.1	Lognormal	na	0.75	0.97	Lognormal	0.0000020	0.0000020
2,3,7,8-Tetrachlorodibenzofuran	10	7	0.0000066	0.00000026	0.0000024	0.0000019	1.3	Lognormal	na	0.77	0.93	Lognormal	0.000015	0.000015

Table I-5
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 9

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC (continued)														
2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	3	0.0000017	<0.0000001	0.00000057	0.00000045	1.3	Lognormal	na	0.66	0.90	Lognormal	0.0000014	0.0000014
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TEQ) [b]	na	na	na	na	na	na	na	na	na	na	na	na	na	0.0000085
Total Heptachlorodibenzofurans (HpCDF)	3	1	0.000095	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0001
Total Heptachlorodibenzo-p-dioxins (HpCDD)	3	2	0.00018	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00018
Total Tetrachlorodibenzofurans (TCDF)	3	2	0.000010	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00001
Diesel Range Organics (DRO)	16	16	510	8.9	150	170	0.88	Inconclusive	na	0.89	0.95	Lognormal	462	462
Residual Range Organics (RRO)	6	6	2,100	53	705	959	0.74	Inconclusive	na	0.97	0.82	Normal	1,539	1,539
Subsurface Water COPC														
Aluminum	2	2	164	49	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	164
Antimony	5	1	0.12	<0.05	0.036	0.059	0.61	Inconclusive	na	0.88	0.99	Lognormal	0.15	0.12
Barium	2	2	1.2	0.27	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.2
Cobalt	2	2	0.037	0.12	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.037
Lead	5	5	0.30	0.019	0.12	0.092	1.3	Lognormal	na	0.64	0.87	Lognormal	1.2	0.30
Manganese	2	2	2.2	0.33	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2.2
Nickel	5	2	0.11	<0.05	0.040	0.053	0.75	Normal	na	0.79	0.77	Normal	0.091	0.091
Vanadium	2	2	0.15	0.10	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.15
Benzene	8	1	0.0012	<0.001	0.00025	0.00059	0.42	Inconclusive	na	nc	nc	nc	nc	0.00075
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	2	2	0.000000060	0.000000044	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000000060
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	2	2	0.0000010	0.000000031	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0000010
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2	1	0.000000037	<0.000000019	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000000037
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2	2	0.00000013	0.000000048	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00000013
2,3,7,8-Tetrachlorodibenzofuran	2	1	0.000000036	<0.00000002	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000000036
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TEQ) [b]	na	na	na	na	na	na	na	na	na	na	na	na	na	0.0000000054
DRO	6	5	7.7	<0.25	2.9	1.8	1.6	Lognormal	na	0.57	0.89	Lognormal	49	7.7
GRO	2	1	4.2	4.2	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	4.2

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - not applicable
nc - not calculated due to low variance in values.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

[b] Toxicity Equivalent Factors (TEFs) and subsequent Toxicity Equivalent Quotients (TEQs) derived from Draft Dioxin Reassessment, USEPA 2000c (Table 9-2).

Table I-6
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 10

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Thallium	1	1	0.34	0.34	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.34
DRO	11	11	26,500	59	11,129	8,952	1.2	Lognormal	na	0.71	0.92	Lognormal	730,658	26,500
DRO_Aromatic	1	1	38	38.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	38

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-7
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 11

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Ethylbenzene	9	1	0.85	0.85	0.28	0.096	3.0	Inconclusive	na	na	na	na	na	0.85
DRO	9	9	69,100	11	23,195	10,306	2.3	Lognormal	na	0.54	0.91	Lognormal	#########	69,100
GRO	9	1	192	192	64	22	2.9	Inconclusive	na	na	na	na	na	192
Subsurface Water COPC														
Benzene	4	1	0.010	0.010	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.010
Methylene chloride	2	1	0.011	0.011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.011
n-Propylbenzene	2	1	0.016	0.016	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.016
Naphthalene	2	1	0.39	0.39	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.39
DRO	4	4	45	0.34	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	45
GRO	2	1	1.1	1.1	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.1

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline Range Organics
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-8
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 13

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Benzene	29	3	0.043	0.018	0.0075	0.0089	0.85	Inconclusive	na	0.60	0.81	Lognormal	0.012	0.012
Ethylbenzene	29	12	1.4	0.11	0.46	0.30	1.5	Inconclusive	na	0.69	0.95	Lognormal	2.7	1.4
m,p,-Xylene	24	13	4.0	0.13	1.2	0.72	1.6	Lognormal	na	0.67	0.92	Lognormal	6.0	4.0
o-Xylene	24	13	1.5	0.010	0.41	0.24	1.7	Inconclusive	na	0.61	0.89	Lognormal	0.80	0.80
Toluene	29	7	0.86	0.018	0.029	0.028	1.0	Inconclusive	na	0.65	0.86	Lognormal	0.80	0.80
PCB-1260 (Aroclor 1260)	33	23	115	0.0065	29	14	2.1	Inconclusive	na	0.54	0.94	Lognormal	586	115
Naphthalene	24	19	15	0.0037	4.4	2.9	1.5	Inconclusive	na	0.71	0.84	Lognormal	4,196	15
DRO	29	29	12,000	21	3,620	3,096	1.2	Lognormal	na	0.82	0.95	Lognormal	17,222	12,000
GRO	29	20	294	3.0	81	68	1.2	Inconclusive	na	0.83	0.90	Lognormal	1,001	294
RRO	24	24	3,400	7.4	767	379	2.0	Lognormal	na	0.47	0.98	Lognormal	1,072	1,072
Subsurface Water COPC														
Arsenic	2	2	0.073	0.036	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.073
Copper	2	2	0.21	0.14	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.21
Lead	2	2	0.45	0.33	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.45
Lead, dissolved	2	1	0.015	0.015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.015
Nickel	2	2	0.17	0.12	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.17
Benzene	8	5	0.12	0.0012	0.041	0.020	2.1	Lognormal	na	0.53	0.95	Lognormal	21	0.12
Ethylbenzene	8	8	0.15	0.018	0.041	0.068	0.61	Inconclusive	na	0.92	0.98	Lognormal	0.14	0.14
Toluene	8	5	0.17	0.00011	0.068	0.037	1.8	Lognormal	na	0.61	0.87	Lognormal	946	0.17
DRO	8	8	100	6.1	33	35	0.92	Lognormal	na	0.81	0.97	Lognormal	117	100
GRO	6	6	4.0	0.52	1.4	2.0	0.72	Inconclusive	na	0.86	0.03	Lognormal	7.4	4.0
RRO	5	4	2.3	0.18	0.18	2.2	2.2	Inconclusive	na	0.16	0.00029	Lognormal	518	2.3

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-9
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 15

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Ethylbenzene	4	2	1.0	0.025	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.0
m,p-Xylene	2	2	1.8	0.043	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.8
o-Xylene	2	1	0.015	0.015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.015
Naphthalene	2	2	28	0.90	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	28
DRO	4	4	16,000	2,190	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	16,000
GRO	4	2	110	60	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	110
Subsurface Water COPC														
Arsenic	1	1	0.11	0.11	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.11
Arsenic, Dissolved	1	1	0.006	0.006	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.006
Lead	1	1	0.68	0.68	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.68
Nickel	1	1	0.20	0.20	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.20
DRO	2	2	960	9.3	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	960
RRO	1	1	3.8	3.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.8

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-10
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 16

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Antimony	13	2	21	14	5.1	6.7	0.76	Inconclusive	na	0.82	0.99	Lognormal	9.6	9.6
Arsenic	13	13	12	3.3	2.2	5.3	0.42	Lognormal	na	0.70	0.87	Lognormal	6.4	6.4
Beryllium	13	2	1.2	1.1	0.060	1.0	0.1	Inconclusive	na	0.97	0.98	Lognormal	1.1	1.1
Cadmium	13	4	7.2	1.4	1.7	1.6	1.1	Inconclusive	na	0.56	0.89	Lognormal	2.4	2.4
Chromium	13	13	147	8.9	40	38	1.1	Lognormal	na	0.70	0.92	Lognormal	69	69
Lead	15	15	822	18	231	178	1.3	Lognormal	na	0.70	0.97	Lognormal	530	530
Thallium	13	2	0.26	0.19	3.7	8.5	0.43	Inconclusive	na	0.97	0.98	Lognormal	36	0.26
Zinc	13	13	12,100	41	3,315	1,081	3.1	Inconclusive	na	0.32	0.76	Lognormal	3,521	3,521
Methylene chloride	4	2	0.0072	0.0061	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0072
PCB-1260 (Aroclor 1260)	15	6	1.4	0.019	0.41	0.22	1.9	Inconclusive	na	0.58	0.79	Lognormal	0.78	0.78
Subsurface Water COPC														
Beryllium	3	2	0.04	0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.04
Cadmium	3	1	0.06	0.06	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.06
Copper	3	3	0.50	0.16	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.50
Lead	5	5	0.67	0.0029	0.28	0.26	1.1	Inconclusive	na	0.93	0.91	Normal	0.53	0.53
Lead, Dissolved	3	1	0.004	0.004	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.004
Nickel	3	3	0.42	0.11	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.42
Zinc	3	3	1.5	0.54	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.5
4-Isopropyltoluene	5	1	0.0066	0.0066	0.0027	0.0017	1.6	Inconclusive	na	na	na	na	na	0.0066
n-Propylbenzene	5	2	0.00490	0.00430	0.0023	0.0021	1.1	Inconclusive	na	0.95	0.92	Normal	0.0043	0.0043
sec-Butylbenzene	5	1	0.0040	0.0040	0.00045	0.0048	0.093	Inconclusive	na	nc	nc	nc	nc	0.0040
Trichloroethene	5	1	0.0033	0.0033	0.0013	0.0011	1.2	Inconclusive	na	0.53	0.53	Lognormal	0.0058	0.0033
bis-(2-ethylhexyl)phthalate	5	3	0.025	0.0014	0.0098	0.0078	0.1	Inconclusive	na	0.40	0.15	Normal	0.017	0.017

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
nc - Not calculated due to low variance in values.
Normal r^2 - Correlation coefficient for the normal plot
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-11
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 19

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Cadmium	8	2	3.2	2.9	1	2	0.63	Inconclusive	na	0.98	0.97	Normal	2.2	2.2
Chromium	16	16	59	4.4	14	18	0.80	Lognormal	na	0.77	0.97	Lognormal	27	27
Lead	16	16	329	14	77	54	1.4	Inconclusive	na	0.49	0.88	Lognormal	86	86
Benzene	15	1	0.74	0.74	0.36	0.14	2.6	Inconclusive	na	0.47	0.8	Lognormal	1.2	0.74
Ethylbenzene	15	2	3.0	0.22	0.81	0.31	2.6	Inconclusive	na	0.47	0.93	Lognormal	14	3.0
m,p-Xylene	8	1	0.20	0.20	0.065	0.041	1.6	Inconclusive	na	0.45	0.64	Lognormal	0.11	0.11
Toluene	15	1	3.1	3.1	0.84	0.30	2.8	Inconclusive	na	0.44	0.89	Lognormal	7.4	3.1
Xylenes	7	2	17	8.0	6.7	3.6	1.9	Inconclusive	na	0.97	0.96	Normal	8.6	8.6
DRO	16	14	13,300	7.0	3,401	1,670	2.0	Lognormal	na	0.53	0.59	Lognormal	380,682	13,300
GRO	16	5	6,650	4.9	1,657	450	3.7	Inconclusive	na	0.28	0.80	Lognormal	14,173	6,650
Subsurface Water COPC														
Copper	2	2	0.20	0.04	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.20
Lead	2	2	0.42	0.14	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.42
Benzene	8	4	0.025	0.006	0.0087	0.0036	2.4	Inconclusive	na	0.43	0.69	Lognormal	0.032	0.025
Ethane	4	1	0.0017	0.0017	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0017
DRO	8	8	34	0.71	14	13	1.0	Inconclusive	na	0.91	0.94	Lognormal	697	34
GRO	6	4	6.1	0.024	2.4	1.1	2.2	Lognormal	na	0.51	0.79	Lognormal	9,534	6.1
RRO	6	3	1.3	0.22	0.51	0.65	0.79	Inconclusive	na	0.90	0.95	Lognormal	5.2	1.3

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-12
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 21

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Aluminum	10	10	33,100	3,975	7,678	17,258	0.44	Inconclusive	na	0.91	0.81	Normal	21,708	21,708
Antimony	19	1	38	38	7.9	7.6	1.0	Inconclusive	na	0.53	0.82	Lognormal	9.7	9.7
Arsenic	19	19	170	2.8	38	18	2.0	Lognormal	na	0.38	0.87	Lognormal	28	28
Barium	10	10	193	56.5	37	120	0.31	Normal	na	0.95	0.93	Normal	141	141
Cadmium	19	8	69	0.40	16	4.5	3.5	Lognormal	na	0.26	0.74	Lognormal	5.2	5.2
Chromium	19	19	93	4.0	21	27	0.76	Inconclusive	na	0.83	0.96	Lognormal	44	44
Cobalt	10	10	14	2.5	4.0	7.4	0.54	Inconclusive	na	0.93	0.97	Lognormal	12	12
Manganese	10	10	786	77	269	405	0.66	Inconclusive	na	0.92	0.92	Normal	561	561
Mercury	19	6	4.8	0.07	1.3	0.48	2.6	Lognormal	na	0.42	0.72	Lognormal	0.76	0.76
Selenium	19	3	2.0	1.0	4.1	3.7	1.1	Inconclusive	na	0.87	0.95	Lognormal	15	2.0
Silver	19	3	6.7	0.90	1.7	1.2	1.4	Lognormal	na	0.58	0.94	Lognormal	2.1	2.1
Thallium	19	1	0.53	0.53	3.7	7.6	0.48	Inconclusive	na	0.97	0.83	Normal	9.1	0.53
Vanadium	10	10	81	8.5	19	45	0.43	Normal	na	0.93	0.76	Normal	56	56
Zinc	19	19	1,130	24	280	252	1.1	Lognormal	na	0.69	0.97	Lognormal	480	480
1,2,4-Trimethylbenzene	4	2	0.19	0.032	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.19
m,p-Xylene	14	7	0.096	0.007	0.024	0.017	1.4	Lognormal	na	0.64	0.97	Lognormal	0.048	0.048
Methylene chloride	4	1	0.006	0.006	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.006
n-Butylbenzene	4	1	0.062	0.062	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.062
n-Propylbenzene	4	1	0.04	0.04	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.04
o-Xylene	14	1	0.006	0.006	0.0042	0.0048	0.88	Inconclusive	na	0.23	0.19	Normal	0.007	0.006
sec-Butylbenzene	4	1	0.036	0.036	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.036
4-Chloroaniline	9	1	5.5	5.5	1.7	1.2	1.4	Lognormal	na	0.66	0.98	Lognormal	5.6	5.5
PCB-1260 (Aroclor 1260)	19	4	3	0.15	2.9	0.91	3.2	Inconclusive	na	0.33	0.72	Lognormal	2.4	2.4
DRO	19	16	3,800	46	859	514	1.7	Inconclusive	na	0.52	0.82	Lognormal	13,909	3,800
RRO	10	10	3,700	25	1,121	1,735	0.65	Normal	na	0.93	0.72	Normal	2,384	2,384
Subsurface Water COPC														
Arsenic	2	2	0.072	0.041	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.072
Copper	2	2	0.26	0.10	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.26
Lead	2	2	0.26	0.10	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.26
Mercury	2	1	0.0006	0.0006	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0006
Nickel	2	2	0.18	0.10	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.18
Zinc	2	2	5.1	0.65	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5.1
n-Propylbenzene	2	1	0.0011	0.0011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0011
DRO	2	2	1.0	0.59	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.0

Table I-12
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 21

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-13
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 22

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Lead	9	9	497	5.4	152	102	1.5	Lognormal	na	0.57	0.91	Lognormal	597	497
o-Xylene	8	3	0.37	0.15	0.13	0.11	1.2	Inconclusive	na	0.75	0.80	Lognormal	0.81	0.37
Benzo(a)pyrene	11	1	0.35	0.35	0.10	0.035	3.0	Inconclusive	na	0.33	0.40	Lognormal	0.079	0.079
DRO	10	5	4,070	284	1,619	1,232	1.3	Inconclusive	na	0.83	0.86	Lognormal	93,037,525	4,070
GRO	10	3	38	24	14	10	1.4	Lognormal	na	0.72	0.88	Lognormal	135	38
RRO	8	7	3,815	5.4	1,313	576	2.3	Lognormal	na	0.46	0.96	Lognormal	159,483	3,815
Subsurface Water COPC														
Manganese	3	3	0.20	0.12	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.20
Manganese, Dissolved	3	3	0.17	0.09	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.17
DRO	4	2	1.4	0.28	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.4
RRO	3	1	2.8	2.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2.8

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-14
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 27

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Benzene	30	11	0.80	<0.0025	0.16	0.089	1.8	Lognormal	na	0.54	0.97	Lognormal	0.28	0.28
Ethylbenzene	30	19	8.09	<0.0025	1.7	0.93	1.8	Lognormal	na	0.59	0.96	Lognormal	14	8.1
m,p-Xylene	25	21	25	0.068	5.8	3.7	1.6	Lognormal	na	0.67	0.96	Lognormal	48	25
o-Xylene	25	21	16	0.010	3.8	3.0	1.3	Inconclusive	na	0.76	0.91	Lognormal	83	16
Toluene	30	11	7.6	<0.0025	1.7	0.80	2.1	Lognormal	na	0.54	0.95	Lognormal	10	7.6
Naphthalene	25	23	191	0.0011	43	25	1.7	Inconclusive	na	0.62	0.93	Lognormal	159,536	191
DRO	35	35	51,000	11	14,364	10,125	1.4	Inconclusive	na	0.74	0.94	Lognormal	293,675	51,000
GRO	30	23	491	2.3	132	140	1.3	Inconclusive	na	0.79	0.94	Lognormal	1,235	491
RRO	25	23	9,100	16	2,453	2,620	0.94	Inconclusive	na	0.89	0.88	Normal	3,459	3,459
Subsurface Water COPC														
Lead	1	1	0.19	0.19	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.19
Lead, Dissolved	1	1	0.0020	0.0020	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0020
Manganese	1	1	0.20	0.20	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.20
Benzene	3	2	0.030	<0.001	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.03
Ethylbenzene	3	2	0.12	<0.001	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.12
DRO	3	3	64	1.4	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	64
GRO	3	2	1.7	<0.1	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.7
RRO	1	1	1.6	1.6	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.6

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-15
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Beryllium	11	1	1.8	1.8	0.43	1.3	0.34	Inconclusive	na	0.95	0.98	Normal	1.5	1.5
Thallium	11	1	0.26	0.26	5.2	11	0.48	Inconclusive	na	0.82	0.56	Normal	14	0.26
Ethylbenzene	10	1	1.1	1.1	0.34	0.12	2.9	Inconclusive	na	0.43	0.86	Lognormal	9.0	1.1
Methylene chloride	5	4	0.16	0.0071	0.065	0.050	1.3	Inconclusive	na	0.79	1.0	Lognormal	21	0.16
PCB-1254 (Aroclor 1254)	19	4	1.5	0.20	0.39	0.21	1.9	Inconclusive	na	0.55	0.82	Lognormal	0.47	0.47
Benzo(a)anthracene	8	1	4.4	4.4	1.5	1.0	1.5	Lognormal	na	0.70	0.91	Lognormal	2,030	4.4
Benzo(a)pyrene	8	1	2.3	2.3	0.82	0.74	1.1	Inconclusive	na	0.87	0.87	Lognormal	850	2.3
Benzo(b)fluoranthene	8	1	2.6	2.6	0.91	0.78	1.2	Inconclusive	na	0.85	0.88	Lognormal	1,072	2.6
DRO	21	20	92,650	7.9	27,349	18,613	1.5	Lognormal	na	0.72	0.92	Lognormal	7,516,257	92,650
DRO_aromatic	2	1	59	59	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	59
GRO	10	4	120	3.7	49	28	1.7	Inconclusive	na	0.71	0.85	Lognormal	8,202	120
RRO	6	6	2,200	1,200	413	1,733	0.24	Inconclusive	na	0.94	0.92	Normal	2,073	2,073
RRO_aromatic	2	2	360	230	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	360
Sediment COPC														
Chromium	68	67	649	<4	77	29	2.6	na	Inconclusive	0.16	0.79	Lognormal	28	28
Lead	68	55	4,590	4.0	554	93	5.9	na	Inconclusive	0.76	0.81	Lognormal	7.4	7.4
Zinc	68	68	4,810	12	589	160	3.7	na	Inconclusive	0.87	0.93	Lognormal	26	26
Benzene	8	1	0.050	<0.0025	0.042	0.031	1.4	Lognormal	na	0.83	1.0	Lognormal	3.5	0.050
Ethylbenzene	8	2	1.8	<0.0025	0.62	0.25	2.5	Lognormal	na	0.46	1.0	Lognormal	318	1.8
PCB-1254 (Aroclor 1254)	79	14	2.8	0.038	1.4	0.29	5.0	na	Inconclusive	0.15	0.79	Lognormal	0.16	0.16
PCB-1260 (Aroclor 1260)	79	27	5.4	<0.041	1.5	0.40	3.8	na	Inconclusive	0.21	0.90	Lognormal	0.52	0.52
beta-BHC	10	2	0.012	0.0036	0.0036	0.0046	0.79	Inconclusive	na	0.88	0.98	Lognormal	0.010	0.010
gamma-BHC (Lindane)	13	2	0.0065	0.0029	3.9	1.8	2.1	Inconclusive	na	0.55	0.72	Lognormal	32,009	0.0065
Dibenzofuran	68	26	5.6	<0.0077	1.2	0.77	1.6	na	Lognormal	0.66	0.94	Lognormal	4.5	4.5
2-Methylnaphthalene	71	58	500	<0.0077	93	35	2.6	na	na	0.40	0.96	Lognormal	1,291	500
Benzo(a)anthracene	71	5	1.9	<0.0062	0.57	0.38	1.5	na	Inconclusive	0.71	0.94	Lognormal	1.5	1.5
Benzo(a)pyrene	71	4	1.4	<0.0062	0.52	0.35	1.5	na	Inconclusive	0.70	0.95	Lognormal	1.4	1.4
Benzo(b)fluoranthene	71	5	1.6	<0.0062	0.54	0.37	1.5	na	Inconclusive	0.72	0.94	Lognormal	1.5	1.5
Ideno(1,2,3-cd)pyrene	71	3	1.2	<0.0062	0.51	0.34	1.5	na	Inconclusive	0.69	0.95	Lognormal	1.3	1.2
Naphthalene	71	55	220	<0.0077	36	13	2.8	na	Lognormal	0.37	0.97	Lognormal	175	175
DRO	83	83	150,000	22.00	26,815	17,557	1.5	na	Inconclusive	0.68	0.96	Lognormal	98,564	98,564
DRO_Aromatic	3	1	60	<12	na	na	na	na	na	na	na	na	na	60
DRO_ Aliphatic	5	5	150,000	26	64,389	36,541	1.8	Lognormal	na	0.67	0.94	Lognormal	2.9E+20	150,000
GRO	5	2	220	<1	95	55	1.7	Lognormal	na	0.75	0.98	Lognormal	8.3E+09	220
RRO	69	66	14,000	69	3,012	2,615	1.2	na	Lognormal	0.69	0.97	Lognormal	3,634	3,634
RRO_Aliphatic	5	4	11,000	58	4,715	2,622	1.8	Lognormal	na	0.63	0.93	Lognormal	5.3E+08	11,000
RRO_Aromatic	5	5	500	64	169	269	0.6	Inconclusive	na	0.98	0.94	na	430	430

Table I-15
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Ephemeral Surface Water COPC														
Chromium	3	1	0.015	0.015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.015
Copper	3	1	0.040	<0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.040
Lead	3	1	0.086	<0.002	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.086
Lead, Dissolved	3	1	0.011	<0.002	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.011
Zinc	3	1	0.62	<0.05	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.62
Zinc, Dissolved	3	1	0.23	<0.05	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.23
PCB-1260 (Aroclor 1260)	15	2	0.0019	<0.0005	0.00044	0.00061	0.72	Inconclusive	na	0.62	0.77	Lognormal	0.00081	0.00081
DRO	17	17	326	0.39	78	22	3.6	Inconclusive	na	0.27	0.83	Lognormal	46	46
GRO	5	1	0.57	<0.05	0.24	0.13	1.8	Inconclusive	na	1.0	1.0	Lognormal	13	0.57
Subsurface Water COPC														
Arsenic	1	1	0.039	0.039	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.039
Copper	2	1	0.18	<0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.18
Lead	2	2	0.20	0.008	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.20
Nickel	2	1	0.16	<0.05	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.16
DRO	2	2	3.2	0.49	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.2
Plant Tissue COPC														
Antimony	1	1	0.0030	0.003	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0030
Arsenic	5	1	0.55	<0.06	0.20	0.19	1.1	Lognormal	na	0.75	0.94	Lognormal	3.1	0.55
Barium	5	5	40	0.45	15	22	0.67	Normal	na	0.96	0.70	Normal	36	36
Cadmium	5	5	1.1	0.0020	0.47	0.30	1.6	Lognormal	na	0.71	0.98	Lognormal	919,651	1.1
Chromium	5	4	10	<0.06	4.1	2.4	1.7	Lognormal	na	0.65	0.98	Lognormal	188,442	9.6
Copper	5	5	3.4	0.58	1.1	2.1	0.52	Normal	na	0.95	0.86	Normal	3.2	3.2
Lead	5	5	5.0	0.065	2.1	1.4	1.5	Lognormal	na	0.73	0.99	Lognormal	2,102	5.0
Mercury	5	4	0.027	<0.004	0.011	0.013	0.86	Inconclusive	na	0.92	0.97	Lognormal	0.22	0.027
Nickel	5	5	3.7	0.060	1.5	1.2	1.2	Lognormal	na	0.78	0.94	Lognormal	551	3.7
Selenium	5	1	0.050	<0.025	0.019	0.044	0.45	Normal	na	0.93	0.80	Normal	0.062	0.050
Silver	5	2	0.023	<0.002	0.0087	0.0093	0.93	Inconclusive	na	0.91	0.97	Lognormal	0.37	0.023
Vanadium	5	5	3.1	0.016	1.4	0.70	2.0	Lognormal	na	0.59	0.90	Lognormal	35,484	3.1
Zinc	5	5	76	1.3	30	32	0.94	Normal	na	0.93	0.89	Normal	61	61
2-Methylnaphthalene	5	3	0.014	<0.005	0.0052	0.0079	0.65	Inconclusive	na	0.70	0.59	Normal	0.013	0.013
Acenaphthene	5	4	0.052	0.0038	0.021	0.016	1.3	Inconclusive	na	0.73	0.77	Lognormal	1.1	0.052
Anthracene	5	4	0.016	<0.005	0.0052	0.0084	0.62	Normal	na	0.80	0.63	Normal	0.013	0.013
Benzo(a)anthracene	5	4	0.11	0.0045	0.049	0.038	1.3	Inconclusive	na	0.79	0.76	Normal	0.088	0.088
Benzo(a)pyrene	5	2	0.17	<0.005	0.075	0.055	1.4	Inconclusive	na	0.78	0.72	Normal	0.13	0.13
Plant Tissue COPC (continued)														
Benzo(b)fluoranthene	5	4	0.15	0.0037	0.065	0.043	1.5	Inconclusive	na	0.73	0.80	Lognormal	153	0.15

Table I-15
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Benzo(g,h,i)perylene	5	3	0.099	0.0031	0.044	0.034	1.3	Inconclusive	na	0.77	0.64	Normal	0.075	0.075
Benzo(k)fluoranthene	5	2	0.16	<0.005	0.072	0.056	1.3	Inconclusive	na	0.78	0.70	Normal	0.12	0.12
Chrysene	5	4	0.21	0.005	0.094	0.068	1.4	Inconclusive	na	0.78	0.77	Normal	0.16	0.16
Dibenz(a,h,)anthracene	5	3	0.033	0.0035	0.014	0.0135	1.0	Normal	na	0.73	0.60	Normal	0.027	0.027
Fluoranthene	5	4	0.50	<0.005	0.25	0.21	1.2	Normal	na	0.75	0.53	Normal	0.44	0.44
Fluorene	5	4	0.041	<0.005	0.017	0.018	0.98	Normal	na	0.77	0.66	Normal	0.034	0.034
Ideno(1,2,3-cd)pyrene	5	4	0.19	0.0027	0.083	0.059	1.4	Inconclusive	na	0.79	0.82	Lognormal	3,555	0.19
Naphthalene	5	4	0.022	0.0043	0.0080	0.0093	0.86	Normal	na	0.73	0.64	Normal	0.017	0.017
Phenanthrene	5	5	0.56	0.0027	0.23	0.19	1.2	Normal	na	0.78	0.50	Normal	0.42	0.42
Pyrene	5	4	0.48	<0.005	0.20	0.17	1.2	Normal	na	0.84	0.64	Normal	0.36	0.36
PCB-1254 (Aroclor 1254)	5	5	0.22	0.0049	0.094	0.090	1.0	Normal	na	0.92	0.88	Normal	0.18	0.18
PCB-1260 (Aroclor 1260)	5	5	0.099	0.0049	0.044	0.040	1.1	Inconclusive	na	0.83	0.88	Lognormal	7.6	0.099

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO-Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-16
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 29

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Freshwater Sediment COPC														
Aluminum	4	4	15,900	4,820	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	15,900
Arsenic	4	4	5.7	2.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5.7
Barium	4	4	115	40	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	115
Cobalt	4	4	7.0	2.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	7.0
Manganese	4	4	114	80	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	114
Mercury	4	1	0.05	0.05	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.050
Vanadium	4	4	35	17	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	35
m,p-Xylene	4	1	0.0032	0.0032	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0032
Dibenzofuran	16	1	0.0086	0.0086	0.040	0.014	2.8	Inconclusive	na	0.29	0.73	Lognormal	0.020	0.0086
DRO	26	24	25,000	9.3	4,883	1,096	4.5	Lognormal	na	0.20	0.92	Lognormal	1,859	1,859
Fresh Surface Water COPC														
Aluminum	4	4	0.04	0.04	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.04
Barium	4	4	0.005	0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.005
Manganese	4	4	0.027	0.017	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.027
Silver, Dissolved	1	1	0.02	0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.02
Zinc	5	1	0.008	<0.006	0.0095	0.0084	1.1	Lognormal	na	0.87	1.0	Lognormal	0.071	0.0080
DRO	13	1	0.33	<0.1	0.077	0.73	0.73	Inconclusive	na	0.86	1.0	Lognormal	0.16	0.16
DRO_ Aliphatic	1	1	0.33	0.33	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.33
GRO	11	2	0.41	<0.05	0.12	0.13	0.93	Lognormal	na	0.75	0.91	Lognormal	0.29	0.29
Fish Tissue COPC														
Arsenic	8	8	0.78	0.50	0.10	0.64	0.16	Inconclusive	na	0.92	0.91	Normal	0.71	0.71
Barium	8	8	0.049	0.015	0.012	0.030	0.39	Inconclusive	na	0.97	0.98	Lognormal	0.043	0.043
Cadmiun	8	4	0.0090	0.0060	0.00095	0.0069	0.14	Lognormal	na	0.85	0.90	Lognormal	0.0075	0.0075
Copper	8	8	0.98	0.55	0.13	0.70	0.18	Lognormal	na	0.82	0.88	Lognormal	0.79	0.79
Lead	8	5	0.012	0.003	0.0032	0.0049	0.65	Lognormal	na	0.79	0.93	Lognormal	0.0080	0.0080
Mercury	8	8	0.022	0.014	0.0026	0.018	0.15	Inconclusive	na	0.99	0.97	Normal	0.020	0.020
Nickel	8	3	0.1	0.03	0.026	0.036	0.71	Lognormal	na	0.60	0.70	Lognormal	0.054	0.054
Selenium	8	8	0.17	0.12	0.015	0.14	0.11	Inconclusive	na	0.95	0.97	Lognormal	0.15	0.15
Vanadium	8	8	0.06	0.017	0.012	0.043	0.28	Normal	na	0.84	0.71	Normal	0.051	0.051
Zinc	8	8	7.1	5.6	0.59	6.5	0.091	Inconclusive	na	0.93	0.92	Normal	6.9	6.9
2-Methylnaphthalene	8	1	0.0065	<0.005	0.0014	0.0030	0.47	nc	nc	nc	nc	nc	nc	0.0065
Acenaphthene	8	2	0.0067	0.0013	0.0016	0.0029	0.56	Inconclusive	na	0.55	0.66	Lognormal	0.0042	0.0042
Fish Tissue COPC (continued)														

Table I-16
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 29

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Anthracene	8	2	0.0072	0.0017	0.0017	0.0030	0.58	Lognormal	na	0.73	0.86	Lognormal	0.0042	0.0042
Benzo(a)anthracene	8	2	0.0082	0.0014	0.0021	0.0031	0.68	Lognormal	na	0.74	0.92	Lognormal	0.0047	0.0047
Benzo(a)pyrene	8	2	0.0059	0.0021	0.0012	0.0029	0.43	Lognormal	na	0.68	0.75	Lognormal	0.0037	0.0037
Benzo(b)fluoranthene	8	2	0.0040	0.0012	0.0007	0.0025	0.30	Inconclusive	na	1.00	0.97	Normal	0.0030	0.0030
Benzo(g,h,i)perylene	8	3	0.0064	0.0034	0.0014	0.0033	0.42	Lognormal	na	0.89	0.96	Lognormal	0.0043	0.0043
Benzo(k)fluoranthene	8	3	0.012	0.0024	0.0033	0.0038	0.87	Lognormal	na	0.56	0.64	Lognormal	0.0064	0.0064
Chrysene	8	2	0.0084	0.0025	0.0021	0.0032	0.64	nc	nc	nc	nc	nc	nc	0.0084
Dibenz(a,h,)anthracene	8	1	0.0041	0.0041	0.00057	0.0027	0.21	nc	nc	nc	nc	nc	nc	0.0041
Fluoranthene	8	3	0.0093	0.0017	0.0025	0.0032	0.77	Lognormal	na	0.59	0.71	Lognormal	0.0050	0.0050
Fluorene	8	3	0.0076	0.0012	0.0020	0.0029	0.69	Lognormal	na	0.73	0.94	Lognormal	0.0046	0.0046
Ideno(1,2,3-cd)pyrene	8	3	0.0027	0.00074	0.00076	0.0021	0.36	Normal	na	0.80	0.77	Normal	0.0026	0.0026
Naphthalene	8	3	0.0047	0.0018	0.00089	0.0026	0.34	Lognormal	na	0.79	0.90	Lognormal	0.0033	0.0033
Phenanthrene	8	4	0.0086	0.0015	0.0023	0.0031	0.74	Lognormal	na	0.59	0.75	Lognormal	0.0048	0.0048
Pyrene	8	3	0.010	0.0026	0.0026	0.0036	0.74	Inconclusive	na	0.62	0.69	Lognormal	0.0054	0.0054
PCB-1254 (Aroclor 1254)	8	8	0.016	0.0061	0.0034	0.012	0.30	Normal	na	0.97	0.95	Normal	0.014	0.014
PCB-1260 (Aroclor 1260)	8	1	0.0045	<0.002	0.0012	0.0014	0.86	nc	nc	nc	nc	nc	nc	0.0045

Notes:

95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration

COPC - Chemical of Potential Concern.

CV - coefficient of variation

DRO - Diesel range organics.

EPC - Exposure point concentration

Lognormal r^2 - Correlation coefficient for the lognormal plot

mg/kg - milligrams per kilogram

na - not applicable

nc - not calculated due to low variance in values.

Normal r^2 - Correlation coefficient for the normal plot

RRO - Residual range organics.

Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-17
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 30

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Fish Tissue COPC														
Arsenic	5	5	0.94	0.33	0.23	0.66	0.34	Inconclusive	na	0.96	0.89	Normal	0.88	0.88
Barium	5	5	0.061	0.024	0.014	0.039	0.36	Inconclusive	na	0.92	0.97	Lognormal	0.059	0.059
Cadmium	5	3	0.008	0.0070	0.00071	0.0070	0.10	Inconclusive	na	nc	nc	nc	nc	0.0080
Copper	5	5	1.2	0.59	0.22	0.79	0.28	Inconclusive	na	0.88	0.93	Lognormal	1.1	1.1
Lead	5	5	0.004	0.0020	0.001	0.003	0.34	Inconclusive	na	nc	nc	nc	nc	0.004
Mercury	5	5	0.034	0.0090	0.011	0.022	0.50	Inconclusive	na	0.94	0.95	Lognormal	0.057	0.034
Nickel	5	4	0.05	0.030	0.011	0.039	0.29	Inconclusive	na	0.98	0.98	Lognormal	0.057	0.050
Selenium	5	5	0.19	0.13	0.022	0.16	0.14	Inconclusive	na	0.95	0.97	Lognormal	0.18	0.18
Vanadium	5	5	0.08	0.046	0.013	0.062	0.21	Inconclusive	na	0.99	0.99	Normal	0.075	0.075
Zinc	5	5	14	5.9	3.4	8.6	0.39	Inconclusive	na	0.85	0.88	Lognormal	14	14
Fluoranthene	5	1	0.0015	0.0015	0.00045	0.0023	0.19	Inconclusive	na	nc	nc	nc	nc	0.0015
PCB-1254 (Aroclor 1254)	5	5	0.011	0.0062	0.0020	0.010	0.21	Inconclusive	na	0.84	0.79	Normal	0.011	0.011
Plant Tissue COPC														
Arsenic	2	1	0.56	<0.21	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.56
Barium	2	2	21	12	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	21
Cadmium	2	2	0.88	0.18	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.88
Chromium	2	2	9.0	1.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	9.0
Copper	2	2	2.8	2.2	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2.8
Lead	2	2	3.5	0.68	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.5
Mercury	2	2	0.021	0.008	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.021
Nickel	2	2	4.2	1.1	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	4.2
Selenium	2	1	0.050	0.050	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.050
Silver	2	2	0.019	0.011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.019
Vanadium	2	2	3.6	0.36	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.6
Zinc	2	2	57	28	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	57
2-Methylnaphthalene	2	1	0.0076	<0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0076
Acenaphthene	2	2	0.013	0.0037	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.013
Anthracene	2	1	0.049	<0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.049
Benzo(a)anthracene	2	2	0.075	0.0025	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.075
Benzo(a)pyrene	2	2	0.021	0.0027	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.021
Benzo(b)fluoranthene	2	2	0.053	0.0045	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.053
Benzo(g,h,i)perylene	2	2	0.013	0.0019	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.013
Benzo(k)fluoranthene	2	2	0.046	0.0045	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.046

Table I-17
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 30

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Plant Tissue COPC (continued)														
Chrysene	2	2	0.087	0.0037	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.087
Dibenz(a,h)anthracene	2	2	0.013	0.0019	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.013
Fluoranthene	2	2	0.38	0.0083	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.38
Fluorene	2	2	0.022	0.0025	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.022
Indeno(1,2,3-cd)pyrene	2	2	0.024	0.0041	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.024
Naphthalene	2	2	0.0078	0.0019	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0078
Phenanthrene	2	2	0.29	0.013	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.29
Pyrene	2	2	0.28	0.0073	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.28
PCB-1254 (Aroclor 1254)	2	2	0.011	0.0097	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.011
PCB-1260 (Aroclor 1260)	2	2	0.0095	0.0050	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0095

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - not applicable
nc - not calculated due to low variance in values.
Normal r^2 - Correlation coefficient for the normal plot
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-18
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 31

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
m,p-Xylene	4	2	0.017	0.0066	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.017
o-Xylene	4	1	0.0053	0.0053	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0053
PCB-1260 (Aroclor 1260)	8	6	22	0.36	7.2	5.3	1.4	Lognormal	na	0.70	0.90	Lognormal	6054	22
DRO	24	24	11,000	11	2,298	1,273	1.8	Lognormal	na	0.53	0.98	Lognormal	8,307	8,307
RRO	24	12	9,600	12	2,817	1,179	2.4	Inconclusive	na	0.45	0.85	Normal	2,165	2,165

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-19
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 32

	Number of		Max Detect	Min Result				Shapiro-	D'Agostino's	Z-score Plots		Assumed		
	Samples	Detections	(mg/kg)	(mg/kg)	Stdev	Mean	CV	Wilkes Test	Test	Normal r^2	Lognormal r^2	Distribution	95% UCL	EPC
Soil COPC														
DRO	5	5	13,000	230	5,647	4,486	1.26	Inconclusive	na	0.82	0.94	Lognormal	7,091,847	13,000
RRO	5	3	3,600	110	1,132	1,580	0.7	Inconclusive	na	0.65	0.71	Lognormal	3,898	3,600

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
na - Not applicable.
mg/kg - milligrams per kilogram

Table I-20
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 33

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
DRO	3	3	660	150	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	660
RRO	3	3	2,100	270	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2,100

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-21
Human Health Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 34

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Diesel Range Organics (DRO)	9	9	1,100	13	419	327	1.3	Lognormal	na	0.75	0.94	Lognormal	9,959	1,100
Residual Range Organics (RRO)	9	8	1,200	58	387	290	1.3	Lognormal	na	0.59	0.86	Lognormal	1,162	1,162

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
CV - coefficient of variation
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
na - Not applicable.
mg/kg - milligrams per kilogram
Normal r^2 - Correlation coefficient for the normal plot
Stdev - standard deviation

Table I-22
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 3

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Lead	3	3	119	27	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	119
PCB-1260	2	2	0.75	0.29	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.75
Antrhacene	3	1	10.3	10	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	10.3
Naphthalene	4	1	50.8	51	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	50.8
DRO	6	5	3,760	314	1,420	1,419	1.0	Normal	na	0.92	0.66	Normal	2,587	2,587
Subsurface Water COPEC														
Xylenes	1	1	0.54	0.54	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.54
DRO	4	4	14	1.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	14
RRO	3	3	8.1	1.3	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	8.1

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-23
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 4

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPC														
Anthracene	1	1	14	14	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	14
Chrysene	1	1	11	11	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	11
Fluorene	1	1	13	13	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	13
DRO	4	4	5,300	150	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5,300
RRO	1	1	3,420	3,420	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3,420
Subsurface Water COPC														
Xylenes	1	1	0.0069	0.0069	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0069
DRO	4	4	3.7	0.96	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.7
RRO	3	3	6.5	2.6	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	6.5

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPC - Chemical of Potential Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-24
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 6

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Aluminum	2	2	9,850	7,790	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	9,850
Manganese	2	2	164	73	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	164
Zinc	13	13	172	20	48	72	0.66	Inconclusive	na	0.91	0.98	Lognormal	106	106
DRO	17	17	102,000	12	27,008	16,359	1.7	Lognormal	na	0.66	0.94	Lognormal	14,716,131	102,000
RRO	6	6	8,500	220	3,127	3,200	0.98	Inconclusive	na	0.90	0.96	Lognormal	122,317	8,500
Ephemeral Surface Water COPEC														
DRO	3	1	1.8	0.050	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.8

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation
[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-25
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 7

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil Tundra COPEC														
Arsenic	18	18	50	2.0	12.32	9.3	1.3	Lognormal	na	0.58	0.84	Lognormal	15	15
Chromium	19	18	100	5.0	27	27	1.0	Lognormal	na	0.70	0.91	Lognormal	43	43
Cadmium	19	9	4.1	1.0	2.5	2.5	1.0	Inconclusive	na	0.61	0.78	Lognormal	3.4	3.4
Copper	19	19	320	6.6	75	44	1.7	Inconclusive	na	0.52	0.84	Lognormal	8.3	8.3
Lead	20	20	460	10	143	96	1.5	Inconclusive	na	0.62	0.86	Lognormal	196	196
Mercury	18	4	0.56	0.10	0.18	0.17	1.1	Inconclusive	na	0.80	0.82	Lognormal	0.31	0.31
Nickel	19	16	280	5.0	62	30.0	2.1	Lognormal	na	0.39	0.90	Lognormal	50	50
Silver	19	2	2.0	2.0	2.6	2.1	1.3	Inconclusive	na	0.60	0.86	Lognormal	3.0	2.0
Bromomethane	10	5	0.40	<0.0053	0.13	0.11	1.3	Inconclusive	na	0.82	0.81	Normal	0.18	0.18
4-Methylphenol (p-Cresol)	14	3	3.9	<0.33	6.4	2.7	2.4	Inconclusive	na	0.41	0.86	Lognormal	13	3.9
PCB-1260 (Aroclor 1260)	22	4	13	<0.05	2.8	0.8	3.5	Inconclusive	na	0.30	0.81	Lognormal	1.6	1.6
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	13	4	0.00052	0.0000011	0.00019	0.000084	2.3	Inconclusive	na	0.46	0.88	Lognormal	0.031	0.00052
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	13	12	0.02	0.00000091	0.0055	0.0016	3.4	Lognormal	na	0.30	0.96	Lognormal	1.54	0.020
1,2,3,4,6,7,8-Heptachlorodibenzofuran	12	4	0.00016	0.00000043	0.000046	0.000016	2.9	Inconclusive	na	0.37	0.80	Lognormal	0.00094	0.00016
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	13	8	0.0011	0.00000047	0.00030	0.00010	3.2	Lognormal	na	0.33	0.88	Lognormal	0.017	0.0011
1,2,3,4,7,8-Hexachlorodibenzofuran	13	4	0.000027	<0.00000015	0.0000074	0.0000028	2.6	Inconclusive	na	0.40	0.85	Lognormal	0.000020	0.000020
1,2,3,6,7,8-Hexachlorodibenzofuran	13	1	0.000011	<0.000000075	0.0000033	0.0000016	2.0	Inconclusive	na	0.54	0.88	Lognormal	0.000015	0.000011
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	13	4	0.000046	<0.000000145	0.000013	0.0000043	2.9	Inconclusive	na	0.35	0.84	Lognormal	0.00003	0.00003
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	13	2	0.000031	0.0000051	0.00000057	0.00000043	1.3	Lognormal	na	0.68	0.95	Lognormal	0.0000012	0.0000012
2,3,4,6,7,8-Hexachlorodibenzofuran	13	8	0.000019	0.00000041	0.0000052	0.0000026	2.0	Inconclusive	na	0.50	0.83	Lognormal	0.0000089	0.0000089
2,3,4,7,8-Pentachlorodibenzofuran	13	1	0.000012	<0.00000008	0.0000035	0.0000018	2.0	Inconclusive	na	0.58	0.87	Lognormal	0.000016	0.000012
2,3,7,8-Tetrachlorodibenzofuran	13	6	0.000029	<0.0000002	0.0000086	0.0000037	2.3	Inconclusive	na	0.49	0.88	Lognormal	0.000031	0.000029
Total Heptachlorodibenzofurans (HpCDF)	3	1	0.00053	<0.00001	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00053
Total Heptachlorodibenzo-p-dioxins (HpCDD)	3	2	0.0022	<0.0000185	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0022
Total Hexachlorodibenzofurans (HxCDF)	3	1	0.00019	<0.000004	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00019
Total Hexachlorodibenzo-p-dioxins (HxCDD)	3	1	0.00034	<0.0000061	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00034
Total Pentachlorodibenzofurans (PeCDF)	3	1	0.00011	<0.0000088	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00011
Total Tetrachlorodibenzofurans (TCDF)	3	1	0.00015	0.00015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00015
Total Tetrachlorodibenzo-p-dioxins (TCDD)	3	1	0.000039	<0.0000069	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000039
DRO	24	21	32,000	11	6,454	1,826	3.5	Lognormal	na	0.25	0.92	Lognormal	32,222	32,000
RRO	7	7	3,900	620	1,396	2,423	0.58	Inconclusive	na	0.19	0.18	Normal	3,448	3,448
Ephemeral Surface Water COPEC														
Arsenic	5	1	0.017	0.017	0.0068	0.0045	1.5	Lognormal	na	0.75	0.99	Lognormal	0.81	0.017
Barium	2	2	0.012	0.008	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.012
Chromium	5	1	0.02	0.02	0.0072	0.009	0.80	Inconclusive	na	0.98	0.97	Normal	0.016	0.016
Lead	5	5	0.065	0.002	0.027	0.016	1.7	Lognormal	na	0.60	0.80	Lognormal	1.2	0.065
Mercury, Dissolved	3	1	0.00038	0.00038	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00038
Nickel	5	1	0.053	0.053	0.020	0.023	0.87	Inconclusive	na	0.98	0.96	Normal	0.041	0.041
Thallium	5	1	0.0024	0.0024	0.054	0.041	1.3	Inconclusive	na	na	na	na	na	0.0024
Thallium, Dissolved	3	1	0.0012	0.0012	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0012
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3	1	0.0000052	<0.00000027	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0000052

Table I-25
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 7

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Ephemeral Surface Water COPEC (continued)														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	3	1	0.00000071	<0.000000051	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00000071
Total Heptachlorodibenzo-p-dioxins (HpCDD)	3	1	0.0000014	<0.000000051	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0000014
DRO	5	2	12	0.2	5.1	2.4	2.1	na	na	na	na	na	na	12

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-26
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 9

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/L)	Min Result (mg/L)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Antimony	15	1	14	14	8.7	13	0.68	Inconclusive	na	0.93	0.96	Lognormal	20	14
Arsenic	15	7	20	3.6	5.2	4.0	1.3	Lognormal	na	0.69	0.91	Lognormal	17	17
Cadmium	15	4	7.0	0.75	2.1	2.2	0.98	Lognormal	na	0.78	0.94	Lognormal	4.1	4.1
Chromium	15	14	60	5.0	14	19	0.70	Lognormal	na	0.77	0.93	Lognormal	29	29
Copper	15	15	429	6.0	106	53	2.0	Lognormal	na	0.40	0.89	Lognormal	98	98
Lead	15	14	630	<10	160	105	1.5	Lognormal	na	0.57	0.92	Lognormal	276	276
Mercury	15	1	0.60	<0.1	0.15	0.13	1.1	Inconclusive	na	0.73	0.98	Lognormal	0.21	0.21
Nickel	15	11	110	<5	26	17	1.6	Inconclusive	na	0.40	0.82	Lognormal	27	27
Selenium	15	1	1.0	<0.5	0.33	0.44	0.73	Inconclusive	na	0.95	0.99	Lognormal	1.1	1.0
Zinc	15	15	1,790	15	463	218	2.1	Inconclusive	na	0.44	0.84	Lognormal	459	459
PCB-1260 (Aroclor 1260)	15	1	0.13	0.13	0.061	0.079	0.77	Inconclusive	na	0.96	0.97	Lognormal	0.14	0.13
1,2-Dibromoethane	8	2	0.000010	0.0000097	0.078	0.045	1.7	Lognormal	na	0.68	0.92	Lognormal	2.06E+08	0.00001
1,2-Dichlorobenzene	15	7	0.025	0.0000016	0.27	0.12	2.3	Lognormal	na	0.46	0.95	Lognormal	6,974,525	0.025
1,3-Dichlorobenzene	15	7	0.068	0.00000025	0.074	0.055	1.3	Inconclusive	na	0.74	0.94	Normal	0.12	0.068
1,3-Dichloropropane	8	5	0.000097	0.0000070	0.031	0.012	2.6	Lognormal	na	0.43	0.97	Lognormal	87,851	0.000097
2,2-Dichloropropane	8	1	0.00000092	0.00000092	0.078	0.059	1.3	Inconclusive	na	0.82	0.83	Lognormal	8.76E+09	0.00000092
2-Chloroethyl vinyl ether	5	2	0.0000026	0.00000054	0.46	0.42	1.1	Normal	na	0.90	0.78	Normal	0.86	0.0000026
2-Chlorotoluene	8	2	0.0000045	0.0000013	0.045	0.031	1.5	Lognormal	na	nc	nc	nc	nc	0.0000045
2-Hexanone	5	2	0.0000087	0.0000078	0.23	0.23	1.0	Normal	na	0.87	0.75	Normal	0.45	0.0000087
4-Bromophenyl phenyl ether	10	2	0.0000024	0.0000012	0.38	0.33	1.1	Inconclusive	na	0.75	0.64	Normal	0.55	0.0000024
4-Chlorophenyl phenyl ether	10	2	0.0000029	0.00000064	0.44	0.39	1.1	Inconclusive	na	0.79	0.72	Normal	0.64	0.0000029
4-Isopropyltoluene	8	3	0.0000047	0.00000077	0.046	0.026	1.8	Lognormal	na	0.64	0.92	Lognormal	1.19E+15	0.0000047
Bromomethane	8	1	0.36	<0.005	0.13	0.10	1.2	Inconclusive	na	0.91	0.92	Lognormal	56	0.36
2,4-Dichlorophenol	10	2	0.0000015	0.00000034	0.44	0.39	1.13	Inconclusive	na	0.79	0.71	Normal	0.64	0.0000015
2,4-Dimethylphenol	10	1	0.0000014	0.0000014	0.42	0.44	0.95	Inconclusive	na	0.87	0.59	Normal	0.69	0.0000014
2,4-Dinitrotoluene	10	1	0.0000016	0.0000016	1.5	1.7	0.85	Inconclusive	na	0.32	0.41	Lognormal	2.427E+10	0.0000016
2,6-Dinitrotoluene	10	1	0.0000016	0.0000016	0.36	0.39	0.94	Inconclusive	na	0.90	0.59	Normal	0.60	0.0000016
2-Methyl-4,6-dinitrophenol	10	3	0.0000037	0.00000022	1.5	1.2	1.3	Inconclusive	na	0.76	0.80	Lognormal	4.9E+26	0.0000037
2-Methylphenol (o-Cresol)	10	1	0.00000035	0.00000035	0.42	0.44	0.95	Inconclusive	na	0.87	0.57	Normal	0.69	0.00000035
3,3-Dichlorobenzidine	10	1	0.00000068	0.00000068	0.71	0.78	0.90	Inconclusive	na	0.93	0.56	Normal	1.2	0.00000068
3-Nitroaniline	10	2	0.0000019	0.0000008	1.5	1.5	1.0	Inconclusive	na	0.85	0.70	Normal	2.3	0.0000019
4-Chloroaniline	10	2	0.000030	0.000030	1.800	2.0	0.92	Lognormal	na	0.91	0.60	Lognormal	3.0	0.000030
4-Chlorotoluene	8	1	0.025	0.00000043	0.077	0.032	2.4	Inconclusive	na	0.47	0.94	Normal	5.76E+13	0.025
4-Nitroaniline	10	1	0.00013	0.0000088	1.5	1.2	1.3	Inconclusive	na	0.76	0.80	Lognormal	1.18E+14	0.00013
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	10	6	0.00012	0.0000038	0.000043	0.000030	1.4	Lognormal	na	0.71	0.96	Lognormal	0.00099	0.00012
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	10	9	0.0011	0.0000070	0.00036	0.00028	1.3	Lognormal	na	0.79	0.96	Lognormal	0.015	0.0011
1,2,3,4,6,7,8-Heptachlorodibenzofuran	10	7	0.000030	0.00000025	0.000011	0.0000080	1.4	Lognormal	na	0.73	0.96	Lognormal	0.00021	0.000030
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	10	8	0.00012	0.00000059	0.000045	0.000035	1.3	Lognormal	na	0.76	0.95	Lognormal	0.0016	0.00012
1,2,3,4,7,8-Hexachlorodibenzofuran	10	4	0.0000066	0.00000023	0.0000020	0.0000015	1.4	Lognormal	na	0.70	0.97	Lognormal	0.0000067	0.0000066
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	10	4	0.0000083	<0.0000004	0.0000025	0.0000020	1.2	Lognormal	na	0.70	0.97	Lognormal	0.0000079	0.0000079
2,3,7,8-Tetrachlorodibenzofuran	10	7	0.0000066	0.00000026	0.0000024	0.0000019	1.3	Lognormal	na	0.77	0.93	Lognormal	0.000015	0.000015
2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	3	0.0000017	<0.0000001	0.00000057	0.00000045	1.3	Lognormal	na	0.66	0.90	Lognormal	0.0000014	0.0000014
Total Heptachlorodibenzofurans (HpCDF)	3	1	0.000095	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000095

Table I-26
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 9

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/L)	Min Result (mg/L)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC (continued)														
Total Heptachlorodibenzo-p-dioxins (HpCDD)	3	2	0.00018	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.00018
Total Tetrachlorodibenzofurans (TCDF)	3	2	0.000010	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.000010
DRO	16	16	510	8.9	150	170	0.88	Inconclusive	na	0.89	0.95	Lognormal	462	462
RRO	6	6	2,100	53	705	959	0.74	Inconclusive	na	0.97	0.82	Normal	1,539	1,539
Ephemeral Surface Water COPEC														
Barium	6	6	0.020	0.005	0.006	0.0078333	0.76	Inconclusive	na	0.66	0.74	Lognormal	0.015	0.015
Zinc, Dissolved	3	1	0.060	0.060	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.060
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3	1	0.0000037	<0.00000024	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0000037

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
nc- Not calculated.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-27
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 21

	Number of								Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Aluminum	10	10	33,100	3,975	7,678	17,258	0.44	Inconclusive	na	0.91	0.81	Normal	21,708	21,708
Antimony	19	1	38	<6	7.9	7.6	1.0	Inconclusive	na	0.53	0.82	Lognormal	9.7	9.7
Arsenic	19	19	170	2.8	38	18	2.0	Lognormal	na	0.38	0.87	Lognormal	28	28
Barium	10	10	193	57	37	120	0.31	Inconclusive	na	0.95	0.93	Normal	141	141
Cadmium	19	8	69	<0.3	16	4.5	3.5	Lognormal	na	0.26	0.74	Lognormal	5	5
Chromium	19	19	93	4.0	21	27	0.76	Inconclusive	na	0.83	0.96	Lognormal	44	44
Copper	19	19	130	4.0	32	37	0.87	Lognormal	na	0.82	0.98	Lognormal	63	63
Mercury	19	6	4.8	<0.06	1.3	0.48	2.6	Lognormal	na	0.42	0.72	Lognormal	0.76	0.76
Selenium	19	3	2.0	1.0	4.1	3.7	1.1	Inconclusive	na	0.87	0.95	Lognormal	15	2.0
Silver	19	3	6.7	<0.4	1.7	1.2	1.4	Lognormal	na	0.58	0.94	Lognormal	2.1	2.1
Vanadium	10	10	81	8.5	19	45	0.43	Normal	na	0.93	0.76	Normal	56	56
Zinc	19	19	1,130	24	280	252	1.1	Lognormal	na	0.69	0.97	Lognormal	480	480
4-Chloroaniline	9	1	5.5	<0.33	1.7	1.2	1.4	Lognormal	na	0.66	0.98	Lognormal	5.6	5.5
PCB-1254 (Aroclor 1254)	19	2	0.14	<0.39	2.9	0.72	3.6	Inconclusive	na	0.24	0.64	Lognormal	0.67	0.14
PCB-1260 (Aroclor 1260)	19	4	3.1	<0.39	2.9	0.91	3.2	Lognormal	na	0.33	0.72	Lognormal	2.4	2.4
DRO	19	16	3,800	46	859	514	1.7	Inconclusive	na	0.52	0.82	Lognormal	13,909	3,800
RRO	10	10	3,700	25	1,121	1,735	0.65	Normal	na	0.93	0.72	Normal	2,384	2,384
Ephemeral Surface Water COPEC														
Arsenic	4	2	0.002	0.002	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.002
Barium	2	2	0.010	0.050	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.010
Manganese	2	2	0.69	0.49	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.69
Diesel Range Organics (DRO)	4	3	0.47	0.20	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.47

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-28
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 22

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Antimony	1	1	34	34	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	34
Lead	9	9	497	5.4	152	102	1.5	Lognormal	na	0.57	0.91	Lognormal	597	497
Zinc	5	5	169	60	44	93	0.47	Inconclusive	na	0.76	0.86	Lognormal	160	160
Di-n-butyl phthalate	1	1	3.5	3.5	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	3.5
Benzo(a)pyrene	11	1	0.35	<0.0053	0.10	0.035	3.0	Inconclusive	na	0.33	0.40	Lognormal	0.079	0.079
Benzo(b)fluoranthene	11	4	0.42	0.00035	0.13	0.041	3.1	Inconclusive	na	0.32	0.66	Lognormal	0.20	0.20
Chrysene	11	7	0.77	0.00020	0.23	0.079	2.9	Lognormal	na	0.36	0.93	Lognormal	6.3	0.77
Naphthalene	11	8	1.2	0.00031	0.42	0.25	1.7	Lognormal	na	0.68	0.93	Lognormal	2,875	1.2
Phenanthrene	11	8	0.21	0.00022	0.12	0.071	1.7	Lognormal	na	0.68	0.94	Lognormal	53	0.21
DRO	10	5	4,070	<4	1,619	1,232	1.3	Inconclusive	na	0.83	0.86	Lognormal	93,037,525	4,070
GRO	10	3	38	<1	14	10	1.4	Lognormal	na	0.72	0.88	Lognormal	135	38
RRO	8	7	3,815	5.4	1,313	576	2.3	Lognormal	na	0.46	0.96	Lognormal	159,483	3,815

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
GRO - Gasoline range organics.
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-29
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
Beryllium	11	1	1.8	1.8	0.43	1.3	0.34	Inconclusive	na	0.95	0.98	Normal	1.5	1.5
PCB-1254 (Aroclor 1254)	19	4	1.5	<0.043	0.39	0.21	1.9	Inconclusive	na	0.55	0.82	Lognormal	0.47	0.47
Anthracene	8	2	1.9	0.016	0.72	0.69	1.0	Inconclusive	na	0.89	0.86	Normal	1.1	1.1
Benzo(a)anthracene	8	1	4.4	<0.018	1.5	1.0	1.5	Lognormal	na	0.70	0.91	Lognormal	2,030	4.4
Benzo(a)pyrene	8	1	2.3	<0.018	0.82	0.74	1.1	Inconclusive	na	0.87	0.87	Lognormal	850	2.3
Benzo(b)fluoranthene	8	1	2.6	<0.018	0.91	0.78	1.2	Inconclusive	na	0.85	0.88	Lognormal	1,072	2.6
Benzo(k)fluoranthene	8	1	2.7	<0.018	0.93	0.79	1.2	Inconclusive	na	0.84	0.88	Lognormal	1,110	2.7
Chrysene	8	1	5.5	<0.018	1.8	1.1	1.6	Lognormal	na	0.64	0.91	Lognormal	3,354	5.5
Fluoranthene	8	2	9.3	<0.025	0.52	0.54	1.0	Inconclusive	na	0.89	0.87	Normal	0.89	0.89
Phenanthrene	8	2	4.1	0.016	1.4	0.96	1.4	Lognormal	na	0.72	0.90	Lognormal	393	4.1
Pyrene	8	2	7.5	0.025	2.5	1.4	1.8	Lognormal	na	0.57	0.93	Lognormal	1,692	7.5
DRO	21	20	92,650	7.9	27,349	18,613	1.5	Lognormal	na	0.72	0.92	Lognormal	7,516,257	92,650
DRO_ Aromatic	2	1	59	59	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	59
DRO_Aliphatic	2	2	490	50	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	490
GRO	10	4	120	3.7	49	28	1.7	Inconclusive	na	0.71	0.85	Lognormal	8,202	120
RRO	6	6	2,200	1,200	413	1,733	0.24	Inconclusive	na	0.94	0.92	Normal	2,073	2,073
RRO_Aromatic	2	2	360	230	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	360
Sediment COPEC														
Chromium	68	67	649	<4	77	29	2.6	na	Inconclusive	0.16	0.79	Lognormal	28	28
Lead	68	55	4,590	4.0	554	93	5.9	na	Inconclusive	0.76	0.81	Lognormal	7.4	7.4
Zinc	68	68	4,810	12	589	160	3.7	na	Inconclusive	0.87	0.93	Lognormal	26	26
Ethylbenzene	8	2	1.8	<0.0025	0.62	0.25	2.5	Lognormal	na	0.46	0.96	Lognormal	318	1.8
Toluene	8	3	0.37	<0.0025	0.13	0.074	1.7	Lognormal	na	0.62	0.98	Lognormal	18	0.37
Xylenes	8	3	0.78	<0.0025	0.26	0.16	1.6	Lognormal	na	0.67	0.89	Lognormal	442	0.78
PCB-1242	79	1	0.12	<0.04	2.8	0.37	7.5	na	Inconclusive	0.09	0.67	Lognormal	0.10	0.10
PCB-1254 (Aroclor 1254)	79	14	2.8	0.038	1.4	0.29	5.0	na	Inconclusive	0.15	0.79	Lognormal	0.16	0.16
PCB-1260 (Aroclor 1260)	79	27	5.4	0.063	1.5	0.40	3.8	na	Inconclusive	0.21	0.90	Lognormal	0.52	0.52
4,4'-DDD	13	6	1.2	<0.00715	3.8	2.0	1.9	Lognormal	na	0.60	0.91	Lognormal	2,635	1.2
beta-BHC	10	2	0.012	0.0036	0.0036	0.0046	0.79	Inconclusive	na	0.88	0.98	Lognormal	0.010	0.010
Endosulfan sulfate	10	1	0.0086	<0.0053	0.0085	0.0093	0.92	Lognormal	na	0.79	0.93	Lognormal	0.020	0.0086
gamma-BHC (Lindane)	13	2	0.0065	<0.00215	3.9	1.8	2.1	Inconclusive	na	0.55	0.72	Lognormal	32,009	0.0065
Heptaclor	13	2	0.0046	<0.00215	3.9	1.8	2.0	Inconclusive	na	0.56	0.72	Lognormal	34,339	0.0046
Dibenzofuran	68	26	5.6	<0.0077	1.2	0.77	1.6	na	Lognormal	0.66	0.94	Lognormal	4.5	4.5
2-Methylnaphthalene	71	58	500	<0.0077	93	35	2.6	na	na	0.40	0.96	Lognormal	1,291	500
Acenaphthene	70	40	14	<0.0077	3.0	1.8	1.7	na	Lognormal	0.61	0.94	Lognormal	15	14
Acenaphthylene	71	1	0.047	<0.0062	0.49	0.32	1.5	na	Inconclusive	0.67	0.95	Lognormal	1.2	0.047
Anthracene	71	7	1.8	<0.0062	0.56	0.38	1.5	na	Inconclusive	0.71	0.94	Lognormal	1.8	1.8
Benzo(a)anthracene	71	5	1.9	0.10	0.57	0.38	1.5	na	Inconclusive	0.71	0.94	Lognormal	1.5	1.5
Benzo(a)pyrene	71	4	1.4	0.13	0.52	0.35	1.5	na	Inconclusive	0.70	0.95	Lognormal	1.4	1.4
Benzo(b)fluoranthene	71	5	1.6	0.10	0.54	0.37	1.5	na	Inconclusive	0.72	0.94	Lognormal	1.5	1.5
Benzo(g,h,I)perylene	71	2	0.91	<0.0062	0.50	0.33	1.5	Lognormal	na	0.68	0.95	Lognormal	1.2	0.91
Benzo(k)fluoranthene	71	4	1.9	0.19	0.55	0.36	1.5	na	Inconclusive	0.72	0.94	Lognormal	1.5	1.5
Chrysene	71	7	2.6	<0.0062	0.67	0.43	1.6	na	Inconclusive	0.67	0.96	Lognormal	1.8	1.8
Dibenzo(a,h)anthracene	71	1	0.015	0.0062	0.49	0.32	1.5	na	Inconclusive	0.67	0.95	Lognormal	1.1	0.015

Table I-29
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Sediment COPEC (continued)														
Fluoranthene	71	12	14	<0.0062	2.1	0.79	2.7	na	Lognormal	0.37	0.97	Lognormal	2.8	2.8
Fluorene	71	47	20	<0.0077	4.8	2.7	1.8	na	Lognormal	0.60	0.95	Lognormal	33	20
Ideno(1,2,3-cd)pyrene	71	3	1.2	0.05	0.51	0.34	1.5	na	Inconclusive	0.69	0.95	Lognormal	1.3	1.2
Naphthalene	71	55	220	0.024	36	13	2.8	na	Lognormal	0.37	0.97	Lognormal	175	175
Phenanthrene	71	42	21	<0.0077	3.9	1.9	2.1	na	Lognormal	0.52	0.95	Lognormal	26	21
Pyrene	71	11	9.5	<0.0062	1.5	0.64	2.3	na	Lognormal	0.44	0.97	Lognormal	24	9.5
DRO	83	83	150,000	22	26,815	17,557	1.5	na	Inconclusive	0.68	0.96	Lognormal	98,564	98,564
DRO_Aromatic	3	1	60	<12	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	60
DRO_ Aliphatic	5	5	150,000	26	64,389	36,541	1.8	Lognormal	na	0.67	0.94	Lognormal	2.87E+20	150,000
GRO	5	2	220	<1	95	55	1.7	Lognormal	na	0.75	0.98	Lognormal	8.25E+09	220
RRO	69	66	14,000	69	3,012	2,615	1.2	na	Lognormal	0.69	0.97	Lognormal	3,634	3,634
RRO_Aliphatic	5	4	11,000	58	4,715	2,622	1.8	Lognormal	na	0.63	0.93	Lognormal	530,973,047	11,000
RRO_Aromatic	5	5	500	64	170	269	0.6	Normal	na	0.98	0.94	Normal	430	430
Ephemeral Surface Water COPEC														
Chromium	3	1	0.015	0.015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.015
Copper	3	1	0.040	0.040	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.040
Lead	3	1	0.086	0.086	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.086
Lead, dissolved	3	1	0.011	0.011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.011
Zinc	3	1	0.62	0.62	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.62
Zinc, dissolved	3	1	0.23	0.23	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.23
PCB-1260 (Aroclor 1260)	15	2	0.0019	0.0015	0.00044	0.00061	0.72	Lognormal	na	0.62	0.77	Lognormal	0.00081	0.00081
DRO	17	17	326	0.39	78	22	3.6	Inconclusive	na	0.27	0.83	Lognormal	46	46
GRO	5	1	0.57	0.025	0.24	0.13	1.8	Inconclusive	na	1.0	1.0	na	na	0.57
Fish Tissue COPC														
Antimony	3	3	0.007	0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.007
Arsenic	3	3	0.08	0.06	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.08
Barium	3	3	1.1	1.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.1
Cadmium	3	3	0.008	0.008	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.008
Copper	3	3	1.2	0.64	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.2
Lead	3	3	0.028	0.011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.028
Mercury	3	3	0.098	0.076	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.098
Nickel	3	3	1.1	0.63	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	1.1
Selenium	3	3	0.16	0.13	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.16
Vanadium	3	3	0.11	0.099	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.11
Zinc	3	3	51	43	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	51
2-Methylnaphthalene	4	4	0.19	0.0053	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.19
Acenaphthene	4	4	0.026	0.0063	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.026
Benzo(g,h,i)perlyene	4	1	0.0043	0.0043	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0043

Table I-29
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Fish Tissue COPC (continued)														
Fluoranthene	4	2	0.0037	0.0015	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0037
Fluorene	4	4	0.067	0.011	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.067
Naphthalene	4	3	0.068	0.016	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.068
Phenanthrene	4	4	0.018	0.0062	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.018
Pyrene	4	2	0.0023	0.0018	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0023
PCB-1260 (Aroclor 1260)	4	4	0.14	0.06	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.14
Plant Tissue COPC														
Antimony	1	1	0.003	0.003	na	na	na	na	na	na	na	na	na	0.003
Arsenic	17	10	2.4	0.06	0.74	0.54	1.4	Lognormal	na	0.68	0.97	Lognormal	1.6	1.6
Barium	17	17	40	0.45	12	15	0.78	Inconclusive	na	0.94	0.90	Normal	45	40
Cadmium	17	17	1.1	0.002	0.26	0.13	2.0	Lognormal	na	0.41	0.90	Lognormal	0.47	0.47
Chromium	17	16	78	0.12	19	6.1	3.0	Lognormal	na	0.31	0.91	Lognormal	24	24
Copper	17	17	6.9	0.54	1.9	2.3	0.80	Lognormal	na	0.79	0.97	Lognormal	3.6	3.6
Lead	17	17	11	0.065	3.6	2.6	1.4	Lognormal	na	0.70	0.98	Lognormal	13	11
Mercury	17	16	0.16	0.003	0.046	0.037	1.2	Lognormal	na	0.74	0.98	Lognormal	0.11	0.11
Nickel	17	17	8.6	0.060	2.1	1.3	1.6	Lognormal	na	0.56	0.97	Lognormal	3.4	3.4
Selenium	17	11	0.99	0.020	0.23	0.12	2.0	Lognormal	na	0.44	0.93	Lognormal	0.23	0.23
Silver	17	8	0.058	0.007	0.014	0.012	1.2	Lognormal	na	0.73	0.98	Lognormal	0.033	0.033
Vanadium	17	17	7.3	0.016	1.9	1.1	1.7	Lognormal	na	0.60	0.98	Lognormal	6.8	6.8
Zinc	17	17	76	1.3	21	25	0.84	Lognormal	na	0.86	0.93	Lognormal	58	58
2-Methylnaphthalene	17	12	0.026	0.0028	0.0058	0.0085	0.69	Lognormal	na	0.80	0.97	Lognormal	0.012	0.012
Acenaphthene	17	13	0.075	0.0017	0.020	0.015	1.2	Lognormal	na	0.63	0.96	Lognormal	0.029	0.029
Anthracene	17	11	0.05	0.0019	0.011	0.0086	1.3	Lognormal	na	0.53	0.91	Lognormal	0.013	0.013
Benzo(a)anthracene	17	11	0.24	0.0028	0.061	0.03	2.1	Inconclusive	na	0.50	0.85	Lognormal	0.088	0.088
Benzo(a)pyrene	17	9	0.30	0.0022	0.080	0.038	2.1	Inconclusive	na	0.50	0.83	Lognormal	0.11	0.11
Benzo(b)fluoranthene	17	14	0.24	0.0018	0.064	0.034	1.9	Lognormal	na	0.51	0.93	Lognormal	0.089	0.089
Benzo(g,h,i)perylene	17	10	0.15	0.0018	0.042	0.022	1.9	Inconclusive	na	0.54	0.84	Lognormal	0.055	0.055
Benzo(k)fluoranthene	17	11	0.34	0.0031	0.088	0.050	1.7	Lognormal	na	0.60	0.94	Lognormal	0.20	0.20
Chrysene	17	15	0.42	0.002	0.11	0.056	1.9	Lognormal	na	0.52	0.95	Lognormal	0.18	0.18
Dibenz(a,h,)anthracene	17	7	0.043	0.0017	0.012	0.0094	1.3	Inconclusive	na	0.67	0.88	Lognormal	0.014	0.014
Fluoranthene	17	16	1.0	0.0072	0.26	0.16	1.6	Lognormal	na	0.60	0.98	Lognormal	0.73	0.73
Fluorene	17	16	0.077	0.002	0.019	0.016	1.2	Lognormal	na	0.63	0.95	Lognormal	0.027	0.027
Ideno(1,2,3-cd)pyrene	17	13	0.21	0.0013	0.066	0.034	1.9	Inconclusive	na	0.53	0.85	Lognormal	0.11	0.11
Naphthalene	17	13	0.042	0.0027	0.010	0.010	0.97	Lognormal	na	0.67	0.95	Lognormal	0.015	0.015
Phenanthrene	17	17	1.0	0.0027	0.25	0.17	1.5	Lognormal	na	0.59	0.92	Lognormal	0.59	0.59
Pyrene	17	16	0.93	0.0048	0.24	0.13	1.8	Lognormal	na	0.54	0.96	Lognormal	0.53	0.53
PCB-1254 (Aroclor 1254)	16	16	9.3	0.0049	2.3	0.68	3.4	Lognormal	na	0.28	0.92	Lognormal	3.0	3.0
PCB-1260 (Aroclor 1260)	16	15	0.92	0.0049	0.26	0.15	1.7	Lognormal	na	0.58	0.97	Lognormal	0.61	0.61

Table I-29
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 28

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
na - Not applicable.
mg/kg - milligrams per kilogram
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-30
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 29

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Freshwater Sediment COPEC														
Aluminum	4	4	15,900	4,820	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	15,900
Arsenic	4	4	5.7	2.8	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	5.7
Barium	4	4	115	40	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	115
Beryllium	5	4	1.3	0.20	0.46	0.70	0.66	Inconclusive	na	0.96	0.94	Normal	1.1	1.1
Cobalt	4	4	7.0	2.0	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	7.0
Manganese	4	4	114	80	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	114
Mercury	4	1	0.05	0.05	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.05
Vanadium	4	4	35	17	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	35
m,p-Xylene	4	1	0.0032	0.0032	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.0032
2-Methylnaphthalene	21	4	0.23	<0.0022	0.060	0.031	2.1	Inconclusive	na	0.50	0.82	Lognormal	0.072	0.072
Acenaphthylene	21	1	0.010	<0.0022	0.035	0.012	2.9	Inconclusive	na	0.26	0.75	Lognormal	0.014	0.010
Anthracene	21	1	0.023	<0.0022	0.035	0.013	2.7	Inconclusive	na	0.29	0.78	Lognormal	0.016	0.016
Fluorene	21	3	0.022	<0.0022	0.035	0.014	2.5	Inconclusive	na	0.31	0.86	Lognormal	0.020	0.020
Naphthalene	21	3	0.11	<0.0022	0.040	0.018	2.2	Inconclusive	na	0.42	0.82	Lognormal	0.031	0.031
Phenanthrene	21	4	0.037	<0.0022	0.035	0.016	2.3	Inconclusive	na	0.37	0.89	Lognormal	0.025	0.025
Pyrene	21	2	0.020	<0.0022	0.035	0.013	2.7	Inconclusive	na	0.29	0.79	Lognormal	0.016	0.016
DRO	26	24	25,000	9.3	4,883	1,096	4.5	Lognormal	na	0.20	0.92	Lognormal	1,859	1,859
RRO	18	17	1,000	10	354	308	1.1	Lognormal	na	0.80	0.96	Lognormal	1,757	1,000
RRO, Aromatic	6	6	137	53	33	87	0.38	Inconclusive	na na	0.92	0.93	Lognormal	133	133
Fresh Surface Water COPEC														
Aluminum	4	4	0.04	0.04	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.04
Barium	4	4	0.005	0.005	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.005
Silver, Dissolved	1	1	0.02	0.02	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.02
DRO	13	1	0.33	0.33	0.077	0.73	0.73	Inconclusive	na	0.86	1.0	Lognormal	0.16	0.16
DRO_ Aliphatic	1	1	0.33	0.33	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.33
GRO	11	2	0.41	0.33	0.12	0.13	0.93	Lognormal	na na	0.75	0.91	Lognormal	0.29	0.29
Fish Tissue COPEC														
Antimony	15	1	0.010	0.010	0.001	0.0076	0.2	Inconclusive	na	0.89	0.91	Lognormal	0.0083	0.0083
Arsenic	15	15	0.780	0.210	0.187	0.5600	0.3	Normal	na	0.91	0.83	Normal	0.65	0.65
Barium	15	15	0.466	0.015	0.141	0.1040	1.4	Lognormal	na	0.63	0.90	Lognormal	0.22	0.22
Cadmiun	15	11	0.044	0.0060	0.013	0.0149	0.9	Inconclusive	na	0.89	0.68	Normal	0.021	0.021
Copper	15	15	3.01	0.550	0.910	1.2333	0.7	Inconclusive	na	0.70	0.82	Lognormal	1.7	1.7
Lead	15	10	0.012	0.0030	0.003	0.0052	0.6	Lognormal	na	0.85	0.95	Lognormal	0.0069	0.0069
Mercury	15	15	0.022	0.0040	0.006	0.0141	0.4	Normal	na	0.93	0.80	Normal	0.017	0.017
Nickel	15	7	1.12	0.030	0.363	0.1940	1.9	Inconclusive	na	0.56	0.78	Lognormal	0.49	0.49

Table I-30
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 29

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Selenium	15	15	0.52	0.120	0.137	0.2133	0.6	Inconclusive	na	0.68	0.77	Lognormal	0.28	0.28
Silver	15	5	0.036	0.011	0.011	0.0098	1.2	Inconclusive	na	0.80	0.85	Lognormal	0.021	0.021
Vanadium	15	15	0.142	0.017	0.031	0.0615	0.5	Lognormal	na	0.84	0.91	Lognormal	0.082	0.082
Zinc	15	15	36.9	5.56	10.631	15.1807	0.7	Inconclusive	na	0.84	0.84	Lognormal	24	24
2-Methylnaphthalene	16	4	0.009	0.0026	0.002	0.0032	0.6	Inconclusive	na	0.33	0.35	Lognormal	0.0038	0.0038
Acenaphthene	16	5	0.0092	0.0013	0.002	0.0031	0.6	Inconclusive	na	0.70	0.84	Lognormal	0.0038	0.0038
Anthracene	16	5	0.011	0.0017	0.002	0.0033	0.7	Inconclusive	na	0.73	0.84	Lognormal	0.0041	0.0041
Benzo(a)anthracene	16	6	0.012	0.0014	0.003	0.0034	0.8	Inconclusive	na	0.61	0.77	Lognormal	0.0043	0.0043
Benzo(a)pyrene	16	4	0.009	0.0021	0.002	0.0031	0.6	Inconclusive	na	0.64	0.73	Lognormal	0.0037	0.0037
Benzo(b)fluoranthene	16	6	0.0073	0.0012	0.001	0.0027	0.5	Inconclusive	na	0.71	0.93	Lognormal	0.0032	0.0032
Benzo(g,h,i)perylene	16	6	0.0089	0.0025	0.002	0.0033	0.5	Inconclusive	na	0.78	0.87	Lognormal	0.0040	0.0040
Benzo(k)fluoranthene	16	6	0.018	0.0024	0.004	0.0043	1.0	Inconclusive	na	0.59	0.71	Lognormal	0.0057	0.0057
Chrysene	16	6	0.012	0.0019	0.003	0.0035	0.8	Inconclusive	na	0.63	0.76	Lognormal	0.0044	0.0044
Dibenz(a,h,)anthracene	16	3	0.0068	0.0016	0.001	0.0028	0.4	Inconclusive	na	0.79	0.93	Lognormal	0.0032	0.0032
Fluoranthene	16	6	0.013	0.0017	0.003	0.0037	0.8	Inconclusive	na	0.61	0.76	Lognormal	0.0047	0.0047
Fluorene	15	6	0.011	0.0012	0.003	0.0033	0.8	Inconclusive	na	0.63	0.83	Lognormal	0.0043	0.0043
Ideno(1,2,3-cd)pyrene	16	7	0.0043	0.0007	0.001	0.0022	0.4	Inconclusive	na	0.91	0.90	Normal	0.0026	0.0026
Naphthalene	16	7	0.0066	0.002	0.001	0.0027	1.8	Inconclusive	na	0.66	0.80	Lognormal	0.0032	0.0032
Phenanthrene	15	9	0.012	0.0014	0.003	0.0035	0.8	Inconclusive	na	0.63	0.83	Lognormal	0.0048	0.0048
Pyrene	16	7	0.014	0.0026	0.003	0.0040	0.8	Inconclusive	na	0.65	0.78	Lognormal	0.0050	0.0050
PCB-1254 (Aroclor 1254)	16	15	0.030	0.0061	0.007	0.0146	0.5	Inconclusive	na	0.92	0.94	Lognormal	0.019	0.019
PCB-1260 (Aroclor 1260)	16	3	0.160	0.16	0.040	0.0114	3.5	Inconclusive	na	0.51	0.84	Lognormal	0.012	0.012

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-31
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 31

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
PCB-1260 (Aroclor 1260)	8	6	22	0.36	7.2	5.3	1.4	Lognormal	na	0.70	0.90	Lognormal	6054	22
DRO	24	24	11,000	11	2,298	1,273	1.8	Lognormal	na	0.53	0.98	Lognormal	8,307	8,307
RRO	24	12	9,600	12	2,817	1,179	2.4	Inconclusive	na	0.45	0.85	Normal	2,165	2,165
Ephemeral Surface Water COPEC														
Barium	2	1	0.003	0.003	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.003
Manganese	2	2	0.005	0.001	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.005

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-32
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 32

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
PCB-1260 (Aroclor 1260)	3	2	0.89	<0.0043	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	0.89
DRO	5	5	13,000	230	5,647	4,486	1.26	Inconclusive	na	0.82	0.94	Lognormal	7,091,847	13,000
RRO	5	3	3,600	1,100	1,132	1,580	0.7	Inconclusive	na	0.65	0.71	Lognormal	3,898	3,600

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-33
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 33

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
DRO	3	3	660	150	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	660
RRO	3	3	2,100	270	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	na [a]	2,100

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

Table I-34
Ecological Summary Statistics and Derived 95% UCLs
Northeast Cape, St. Lawrence Island, Alaska
Site 34

	Number of									Z-score Plots				
	Samples	Detections	Max Detect (mg/kg)	Min Result (mg/kg)	Stdev	Mean	CV	Shapiro-Wilkes Test	D'Agostino's Test	Normal r^2	Lognormal r^2	Assumed Distribution	95% UCL	EPC
Soil COPEC														
PCB-1254 (Aroclor 1254)	8	5	0.59	0.020	0.19	0.16	1.2	Lognormal	na	0.76	0.91	Lognormal	1.6	0.59
PCB-1260 (Aroclor 1260)	8	4	0.47	0.019	0.15	0.099	1.6	Lognormal	na	0.56	0.84	Lognormal	0.47	0.47
DRO	9	9	1,100	13	419	327	1.3	Lognormal	na	0.75	0.94	Lognormal	9,959	1,100
RRO	9	8	1,200	58	387	290	1.3	Lognormal	na	0.59	0.86	Lognormal	1,162	1,162

Notes:
95% UCL - 95 percent upper confidence limit (UCL) on the mean concentration
COPEC - Chemical of Potential Ecological Concern.
CV - coefficient of variation
DRO - Diesel range organics.
EPC - Exposure point concentration
Lognormal r^2 - Correlation coefficient for the lognormal plot
mg/kg - milligrams per kilogram
na - Not applicable.
Normal r^2 - Correlation coefficient for the normal plot
RRO - Residual range organics.
Stdev - standard deviation

[a] Consistent with methods described by ADEC (ADEC, 2003) and USEPA (USEPA, 2002b), less than 5 samples in a data set are inadequate to calculate a meaningful 95% UCL. In this case, the maximum concentration was used for the EPC value.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-6898

REPLY TO
ATTENTION OF:

April 13, 2004

Programs and Project Management Division
Civil Projects Management Branch

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«City», «State» «PostalCode»

Dear «Title» «LastName»:

Enclosed for your files is a copy of the Final Human Health and Ecological Risk Assessment, Northeast Cape Installation, St. Lawrence Island, Alaska, submitted to the Corps by Montgomery Watson -Harza (MWH). This two-volume report is intended to evaluate potential impacts of site-related chemicals on public health and on the environment.

Since this is a final report, there is no mandated review period. Nonetheless, the U.S. Army Corps of Engineers is interested to know whether you feel your previous comments have been fully addressed. Therefore, upon reading the document, if you believe your concerns have not been satisfactorily responded to, please let me know. If you submitted written comments, a copy of your comments with a response is included. All comments will be supplied to the Information Repositories.

Please note, attached to the back inside cover of Volume I are comments from the US Army Center for Health Promotion and Preventive Medicine (CHPPM) regarding the Technical Memorandum, *Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape Installation, St. Lawrence Island, Alaska*, May 2003. These comments were not sought until after the Technical Memorandum was finalized and could not be captured in the final document. Certain comments in this attachment are appropriate to the Risk Assessment as well.

This letter has also been furnished to the following individuals and organizations:

Honorable Fritz Waghiyi, President, Native Village of Savoonga
Honorable Jesse Gologergen, Mayor, Mayor of Savoonga
Mr. Job Koonooka, President, Sivuqaq, Inc.
Mr. Morris Toolie, Jr., President, Savoonga Native Corporation
Mr. Morris Toolie, Jr., RAB Community Co-chair, Savoonga
Information Repository

Gambell Information Repository
Mr. Jeff Brownlee, Alaska Department of Environmental Conservation
Ms. June Martin, SLI Coordinator, Alaska Community Action on Toxics
Mr. Jerald Reichlin, Fortier and Mikko
Dr. Ron Scrudato, State University of New York, TAPP Grant
National Parks Service, Nome Information Repository
ARLIS, Anchorage Information Repository
Ms. Ronie Shackelford, USACHPPM

If you have any questions, please contact me at (907) 753-2689, or by e-mail at carey.c.cossaboom@poa02.usace.army.mil.

Sincerely,

Carey Cossaboom
Project Manager

Enclosures

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	LastName	JobTitle	Company	Address1	City	State	PostalCode	FirstName	
a.	Brownlee	Project Manager	Alaska Department of Environmental Conservation	555 Cordova St., 2nd floor	Anchorage	AK	99501	Jeff	M
b.	Waghiyi	President	Native Village of Savoonga	P.O. Box 120	Savoonga	AK	99769	Fritz	H
c.	Koonooka	President	Sivuqaq, Inc.	P.O. Box 101	Gambell	AK	99742	Job	M
d.	Toolie, Jr.	President	Savoonga Native Corporation	P.O. Box 160	Savoonga	AK	99769	Morris	M
e.	Martin	Project Coordinator	Alaska Community Action on Toxics	505 W. Northern Lights Blvd., #205	Anchorage	AK	99503	June	M
f.	Reichlin	Attorney	Fortier and Mikko	101 W. Benson Blvd, Suite 304	Anchorage	AK	99503	Jerald	M
		Gambell Information Repository	Sivuqaq Corporation Building	P.O. Box 101	Gambell	AK	99742		
g.	Selig	St. Lawrence Island FUDS Information Repository	National Parks Service	179 Front St, Suite 121	Nome	AK	99762	Leigh	M
h.	Lawrence Island FUDS	Anchorage Information Repository	Alaska Resource Library and Information Services (ARLIS)	3150 C Street, Suite 100	Anchorage	AK	99503		S
i.	Scrudato			54 Sunset Bluff	Oswego	NY	13126	Ronald	D
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k.	Gologergen	Mayor	Village of Savoonga	P.O. Box 120	Savoonga	AK	99769	Jesse	H
l.	Shackelford	USACHPPM	MCHB-TS-REH	Building 1675	Aberdeen Proving Grounds	MD	21010-5422	Ronie	M

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-6898

REPLY TO
ATTENTION OF:

April 19, 2004

Programs and Project Management Division
Civil Projects Management Branch

Mr. Terry Walker
U.S. Army Corps of Engineers
HTRW CX (ATTN: Document Distribution)
12565 West Center Road
Omaha, NE 68144-3869

Dear Mr. Walker:

Enclosed for your files is a copy of the Final Human Health and Ecological Risk Assessment, Northeast Cape Installation, St. Lawrence Island, Alaska, submitted to the Corps by Montgomery Watson Harza (MWH). This two-volume report is intended to evaluate potential impacts of site-related chemicals on public health and on the environment.

Since this is a final report, there is no mandated review period. Nonetheless, the U.S. Army Corps of Engineers is interested to know whether you feel your previous comments have been fully addressed. Therefore, upon reading the document, if you believe your concerns have not been satisfactorily responded to, please let me know. If you submitted written comments, a copy of your comments with a response is included. All comments will be supplied to the Information Repositories.

Please note, attached to the back inside cover of Volume I are comments from the US Army Center for Health Promotion and Preventive Medicine (CHPPM) regarding the Technical Memorandum, *Background Determination for Risk Assessment, Derivation of Ambient Concentrations for Abiotic Media Associated with the Northeast Cape Installation, St. Lawrence Island, Alaska*, May 2003. These comments were not sought until after the Technical Memorandum was finalized and could not be captured in the final document. Certain comments in this attachment are appropriate to the Risk Assessment as well.

This letter has also been furnished to the following individuals and organizations:

Honorable Fritz Waghiyi, President, Native Village of Savoonga
Honorable Jesse Gologergen, Mayor, Mayor of Savoonga
Mr. Job Koonooka, President, Sivuqaq, Inc.
Mr. Morris Toolie, Jr., President, Savoonga Native Corporation
Mr. Morris Toolie, Jr., RAB Community Co-chair, Savoonga
Information Repository
Gambell Information Repository

Mr. Jeff Brownlee, Alaska Department of Environmental Conservation
Ms. June Martin, SLI Coordinator, Alaska Community Action on Toxics
Mr. Jerald Reichlin, Fortier and Mikko
Dr. Ron Scrudato, State University of New York, TAPP Grant
National Parks Service, Nome Information Repository
ARLIS, Anchorage Information Repository
Ms. Ronie Shackelford, USACHPPM

If you have any questions, please contact me at (907) 753-2689, or by e-mail at carey.c.cossaboom@poa02.usace.army.mil.

Sincerely,

Carey Cossaboom
Project Manager

Enclosures

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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-6898

REPLY TO
ATTENTION OF:

April 19, 2004

Programs and Project Management Division
Civil Works Management Branch

«Title» «FirstName» «LastName»
«Company»
«Address1»
«City», «State» «PostalCode»

Dear «Title» «LastName»:

Three Final Reports were recently delivered to your local Information Repository. These reports are: 1) the Gambell NALEMP Removal Action Report submitted to the Corps by Montgomery Watson Harza (MWH); 2) the Gambell Feasibility Study for FUDS sites; and 3) the Final Human Health and Ecological Risk Assessment, Northeast Cape Installation, St. Lawrence Island, Alaska, submitted to the Corps by Montgomery Watson Harza (MWH). The NALEMP report describes the debris removal activities at Sites 6 and 7 that took place in Gambell last summer. The Feasibility Study evaluates alternatives for future remedial actions at selected sites in Gambell. The two-volume Risk Assessment at NE Cape is intended to evaluate potential impacts of site-related chemicals on public health and on the environment.

Since these reports are final, there is no formal review period. Nonetheless, the U.S. Army Corps of Engineers is interested to know whether you feel your previous comments have been fully addressed. Therefore, upon reading the document, if you believe the Corps has not satisfactorily responded to your concerns, please let me know. If you submitted written comments, a copy of your comments with a response is included. All comments will be supplied to the Information Repositories.

This letter has been furnished to the following RAB Members:

Mr. Alex Akeya
Ms. Peggy Akeya
Mr. Leonard Apangalook, Sr.
Mr. Paul Apangalook
Mr. Melvin Apassingok
Mr. Merle Apassingok
Mr. Jerome Apatiki
Ms. Lucy Apatiki
Mr. Jesse Gologergan

Ms. Linda Gologergan
Ms. Jeanette Iya
Ms. C. Jane Kava
Mr. Christopher Koonooka
Mr. Job Koonooka
Mr. Merlin Koonooka
Ms. June Martin
Ms. Pam Miller
Mr. George Noongwook
Mr. Conrad Oozeva
Mr. Jerry Reichlin
Mr. Paul Rookok, Sr.
Mr. Morris Toolie, Jr.
Ms. Viola Waghiyi
Mr. Kevin Zweifel

Call me at (907) 753-2689, or e-mail me at: carey.c.cossaboom@poa02.usace.army.mil, if you have any questions.

Sincerely,

Carey Cossaboom
Project Manager

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	Title	FirstName	LastName	Company	Address1	City	State	Comments	PostalCode
a.	Mr.	Alex	Akeya		P.O. Box 108	Savoonga	AK		99769
b.	Ms.	Peggy	Akeya		P.O. Box 192	Savoonga	AK		99769
c.	Mr.	Leonard	Apangalook, Sr.		P.O. Box 93	Gambell	AK		99742
d.	Mr.	Paul	Apangalook		General Delivery	Gambell	AK	Confirm mailing address	99742
e.	Mr.	Melvin	Apassingok		P.O. Box 91	Gambell	AK		99742
f.	Mr.	Merle	Apassingok		P.O. Box 182	Gambell	AK		99742
g.	Mr.	Jerome	Apatiki		P.O. Box 12	Gambell	AK		99742
h.	Ms.	Lucy	Apatiki		P.O. Box 138	Gambell	AK	ACAT	99742
i.	Mr.	Jeff	Brownlee	ADEC	555 Cordova St., 2nd Floor	Anchorage	AK		99501
j.	Mr.	Jesse	Gologergan		P.O. Box 105	Savoonga	AK	Confirm mailing address	99769
k.	Ms.	Linda	Gologergan		P.O. Box 1688	Nome	AK		99762
l.	Ms.	Jeanette	Iya	Savoonga IRA Building	P.O. Box 120	Savoonga	AK		99769
m.	Ms.	C. Jane	Kava		P.O. Box 154	Savoonga	AK	ACAT and Mayor of Savoonga	99769
n.	Mr.	Christopher	Koonooka		P.O. Box 123	Gambell	AK		99742
o.	Mr.	Job	Koonooka		P.O. Box 123	Gambell	AK		99742
p.	Mr.	Merlin	Koonooka		P.O. Box 67	Gambell	AK		99742
q.	Ms.	June	Martin	Alaska Community Action on Toxics	505 W. Northern Lights Blvd., #205	Anchorage	AK		99503
r.	Ms.	Pam	Miller	Alaska Community Action on Toxics	505 W. Northern Lights Blvd. #205	Anchorage	AK		99503
s.	Mr.	George	Noongwook		P.O. Box 81	Savoonga	AK		99769

SIVUQAQ INCORPORATED
P.O. BOX 101
GAMBELL, ALASKA 99742-0101
(907) 985-5826

MEMORANDUM

TO: Mr. Carey Cossaboom
FROM: Morgan Apatiki MLA
DATE: December 22, 2003

Enclosed, please find my review comments on the HH&ERA, NEC., AK.

I will be sending the original copies. Thank You!

Number of pages, including the cover sheet. (8)

SIVUQAQ INCORPORATED
P.O. BOX 101
GAMBELL, ALASKA 99742-0101
(907) 985-5826

TO: Mr. Carey Cossaboom
FUDS Project Manager

FROM: Mr. Morgan Apatiki MLA
Local Liaison

DATE: December 22, 2003

SUBJECT: HH&ERA/NEC. PROJECT

Enclosed, please find my Review and Comments on the Human Health and Ecological Risk Assessment, Northeast Cape Installation, St. Lawrence Island, Alaska: Draft Final, October 2003, prepared by: MWH.

If you have any questions and comments, please feel free to call or contact me.

Thank You! for the services and your time efforts that you provided to the St. Lawrence Island, Communities.

Sincerely,

LIAISON

SIVUQAQ INCORPORATED

CC: SIVUQAQ INCORPORATED
Board of Directors

ACAT
Anchorage, Alaska

REVIEW COMMENTS
Human Health and Ecological Risk Assessment
Northeast Cape Installation, St. Lawrence Island, Alaska
DRAFT FINAL, October 2003

REVIEWER
Morgan Apatiki
Liaison
Sivuqaq, Inc.

ITEM	REF	COMMENTS
1.	1.1.2 Page 1-2	Locals have specified that there is presence of the asbestos and asbestos containing material in and surrounding the military burial Sites. Some of the burial sites that have organic compounds and has been indicated as-Inert and yet are indicated as "No Further Action". The metallic forms, when layed or buried underground, can produce Arsenic. The organic compounds can produce Chloroform. Questions: -What will you do with the Sites that are indicated for "no further action"? -What will be the outcome of the liability damage done to those Areas? In accordance with CERCLA, the environmentally damaged (Disturb) Areas, are responsibility of the "Party" and should be compensated for its liability act, accordingly.
2.	2-1 2-2 Page X 1.1.2 Site 28 Page 1-3	Sections listed on the left, are statements of Drainage Basin. Oil spills or organic, when grounded or basined underground for years, the residual or outer appearance of the drainage may be degraded, but the core remains active. The run-off or the migration of the spills, either on ground surface or subsurface should be evaluated accordingly.

ITEM	REF	COMMENTS
2.	1.1.2 Site 28 Page 1-3	The pits, pockets, and bays of the streams, and rivers, especially in rocky points, should be evaluated thoroughly for remains of the RRO or sediments. Ref., Sec. 1.2, Page 1-4. Locals have knowledge of the types of Petroleum Products, other than organic elements, associated with military activities that have been spilled, both in the village of Gambell, and Northeast Cape, St. Lawrence Island, Alaska. They also acknowledge the radiation from those Sites, specifically, during the warm climate, the stench from it can be smelled from a certain distance. Since the drainage basin do not seem to appear or proposed for the remedial cleanup removal, ever since the performances of the Geophysical Survey and Remedial Investigations conducted back in the early 1980's, but it is apparently stated in the Site History and Previous Investigations. Ref. 1.4, Page 1-5. There are several local concerns and questions regarding the possible flood and migration from the drainage basin in the following sections: -People would like to know the specific total amounts of the extent quantity contained in the drainage basin? -What human health risk factor is related in this kind of situation? -People are aware of the Human Ecology and Consumption that is contaminated by the presence of Formerly Utilized Defense Sites, Hazardous Toxic Radioactive Wastes. And the Inhalant Volatile from the Sites. -The condition of the Environmental Impact on the Island should be evaluated accordingly, and Promptly.

ITEM	REF	COMMENTS
3.	1.2 Page 1-4	There are two factors of the saturated soils. One that is being proposed for the Soil Cleanup Criteria-18 AAC 75, Ref. 1.2, Page 1-4. The other saturated soil is coming from the drainage basin. Organics that soaked into the soil and have possibly migrated to the surrounding environment, linked to the streams and the Run-Offs of the Contaminant migrates to Streams, Rivers, and the rivers run-out to the Sea. There are several questions and comments about the removal of the soil: -One of the local laborers from Gambell Residence, who worked during the Nugget Construction, Incorporated, Soil Cleanup in Summer of 2001, reported that the operation of the performance was ceased and was reburied for some reason. Was this action reported to-USACE, Alaska District? -Is there a proposal for continuation of this project or was this project part of the proposed soil cleanup criteria stated in this section? -The recommendation from the community, that there may not be accurate remedial minimization of the soil cleanup, unless the drainage basin that flows to the areas, has been drained-out and removed from the Site!
4.	1.4 Page 1-5	The documents, entitled: Final Report; Geophysical Survey Investigation; St. Lawrence Island, Alaska, USA: Prepared by: Golder Associates, Anchorage, Alaska, prepared for: Montgomery Watson, Anchorage, Alaska, Dated November 2, 1994, is not included in this section.
5.	1.4 Page 1-6	Can you be more specific stating the Phase I RI, conducted at the installation since-1994? What are the proper titles for these Documents?

ITEM	REF	COMMENTS
6.	1.5.1 Page 1-7	The St. Lawrence Island, subartic maritime climate, in most cases, is Unpredictable. Specifically, at the farthermost Tips on the Island. One in vicinity of Gambell at Northwest tip and Northeast Cape at the other end of the tip. Most likely, Gambell has high winds, while it is moderate over at Northeast Cape. Also, Gambell is cold, wet, windy, while moderate over at Savoonga, and warm, dry at Northeast Cape, Alaska. The annual precipitation varies also. During the winter, there is less snow at Northeast Cape, while plenty at Savoonga, and the snow is soft and fluffy, due to the calm wind. Gambell's snowfall is unpredictable at most. The snow is hardpacked and driven-off by the high wind. The diversity of the overall climate on the Island, may be reversed. Basically, depending upon the yearly basis. In some years, there is diverse cycle of the climate on the Island.
7.	1.5.4 Page 1-8	There is water seepage, most like year round when there is plenty of rainfall in the Summer and snowfall during winter. The water drips and seeps through out the winter and snowmelt during Spring and accasional rainfall or heavy rain during summer will continuously deposit aquafer and feeds the Groundwater and Deep Groundwater (Pockets). And is capable of consistently supporting aquatic life throughout the whole year. The aquatic life is also supported by fog and obscure weather and the environmental climate stays wet during the summer.
8.	1.5.5 Page 1-9	The life of the aquafer becomes ephemeral, depending on the temperature and humidity. during the spring and summer, when the temperature is warm, the flow of water from the snowmelt will be in fast pace. When the temperature is cold, the runoff will be at a slow pace.

ITEM	REF	COMMENTS
8	1.5.5 Page 1-9	When we experienced dry weather with no rainfall, the land becomes ephemeral. But with continuous rainfall during the summer, and plenty of snowmelt during winter, there will be aquatic life, throughout the year. The whole "Island" is a "Wet-Land" in which we call the'Tundra".
9.	1.6 Page 1-9 1.5.4 Page 1-8	The groundwater regime, may be caused by the recurring currents from North and South Directions, occurring once during the day. The groundwater level can be elevated by high-tides. Especially, during the High Wind that cause the high tides rise and flood the area. It actually could be caused by lack of rain during the summer and snowfall during the-winter. During the summer, the groundwater is degrading and drop beyond the permafrost. And can be elevated coming winter and fill the ground surface trenches. During the summer, the temperature is hot and dry that makes the groundwater level drop fast to low level and below the permafrost level. The average depth measurement of the groundwater level in mid-summer is about 10-12 feet below the ground surface. The deep groundwater deposits, Ref. 1.6.1, Page 1-10, may also be called: Subsurface Pure Water Drainage Basin. There are other pockets in the surrounding habitual soil structure that are discrepant in Depth Measurements. The pockets are continuously fueled from the Winter Solstice and Summer Solstice Environment. What can be done or how can you deal with the insufficient subsurface water Sampling? The permafrost in Gambell is about 12 feet below the subsurface that is currently in cold climate and about 15-20 feet below level at Northeast Cape, that is currently in warmer climate.

ITEM	REF	COMMENTS
9.	1.6 Page 1-9	Since the residents in Gambell had experienes of DRO, etc., on top of the permafrost that has been encountered by the constructions-crew, while lining-up the mains of the community. They also suspect similar situations at Northeast Cape, that DRO, or the Drainage Basined at several locations, are on top of the Permafrost. The condition of the environmental structure and atmosphere, could not be determined by MWH's, within their 10 years study of the geophysical survey and remedial investigations.
10.	1.6 Page 1-9	The monitoring wells should be appropriated (Installed) in accordance with the direction of the groundwater flow and should not be set beyond the groundwater flow. How deep were the piping, in feet, set in the wells?
11.	Sec. 2 Page 1-1	Did you evaluate all of the Geophysical DATA Check's beginning from the previous investigations to present time and overview all of the Statements of Work were met?
12.	GENERAL	The Community of Gambell appreciates the continuous effort on the Cleanup Projects on the Island. Thank You!