PRELIMINARY ASSESSMENT
DATA REQUIREMENTS
FOR FEDERAL FACILITY DOCKET SITES

RED TOP RETORT SITE

EPA ID Number: AK 0001413822

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Prepared by:
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INTRODUCTION

Background

The Red Top Retort Site processed mercury ore (cinnabar) derived from the Red Top Mine between 1952 and 1955. The retort site covered approximately 1/8 acre on the bank of the Wood River. Mercury was extracted by heating crushed ore in a retort chamber, which consisted of a steel cylinder 8.5 feet long and 2 feet in diameter. The chamber was housed in a 10 x 15 feet wood and tin shack. Fuel sources for heating were wood and bunker-C fuel.

Site Location and Access

The Red Top Retort Site is located approximately 340 miles southwest of Anchorage, Alaska, 18 miles north of Dillingham, and 2 miles east-southeast of the Village of Aleknagik. The site resides on the north bank of the Wood River in Section 32, T10S, R55W, Seward Meridian. There is no road access to the site. From Anchorage, air travel is the only practical mode of transportation. Heavy equipment may be barged. Commercial flights are available to Dillingham. A vehicle may be rented in Dillingham and driven to Aleknagik, where a boat must be rented to access the site down river. An aircraft may be chartered in Anchorage and flown to a gravel airstrip in Aleknagik.

1994 Activities

A site assessment was completed in August, 1994. Remedial activities took place in September, 1994. Sampling and analysis showed that soils in and around the retort shack were contaminated with mercury and/or Diesel Range Organics (DRO) at levels that exceed state and federal regulations. In September, 1994, approximately 180 - one cubic yard boxes were filled with mercury and/or DRO contaminated soils excavated from the mercury retort area. Some of the 180 boxes contained construction debris from the retort shed, including asbestos heat panels and gaskets. Area soil samples before excavation ranged between non-detect to 15,000 ppm total mercury, and DRO was measured up to 140,000 ppm. At least 30 cubic yards of Diesel Range Organic (DRO) contaminated soils were stockpiled and covered on site. (AQE, 1994, 1995)

1998 Activities

All previously excavated, containerized and stockpiled soils were removed from the site and disposed of in permitted facilities. Additional soils were excavated where previous sampling and analyses showed elevated levels of mercury. The site was resampled. Analytical results and details of removal activities are reported in the 1998 Remedial Action Report, Red Top Retort Site, by Harding Lawson and Associates, Inc. (HLA).

PRELIMINARY ASSESSMENT (PA)
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1) Supply copies of all existing sampling data, on-site and off-site, including location map, detection limits (see definitions, p. 5), raw data sheets, QA/QC documents, date(s) sampled, analytical method(s) used, well boring logs and sampling technique(s).

See Figure 1 for location map.

All information requested in question 1 has been sent to EPA, Region X in the following reports:

1. Remedial Action Report, Red Top Retort Site, 1998, Harding Lawson and Associates, Inc.

2. Remedial Action Report: BLM Red Top Retort Site, Wood River, Alaska, Volume 1 & 2, 1995, AQE.

3. Site Assessment Report: BLM Red Top Retort Site, Wood River, Alaska, Volume 1 & 2, 1994, AQE.

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2) Locate and Identify on a topo map all known or suspected sources (see definitions, Appendix 2, p. 5). Supply all information about source(s) such as: dates of operation, use and spillage; amounts of material deposited, stored or spilled; dimensions of source(s); known or suspected hazardous substances (see definitions, Appendix 2, p. 5), etc.

See Figure 2.

All original sources and most secondary sources (soil) have been removed from the site. The information below summarizes more detailed information available in reports listed in the response to question #1.

The Red Top Retort Site processed mercury ore (cinnabar) from the Red Top Mine between 1952 and 1955. The retort site covered approximately 1/8 acre on the bank of the Wood River. Mercury was extracted by heating crushed ore in a retort chamber, which consisted of a steel cylinder 8.5 feet long by 2 feet diameter. The chamber was housed in a 10 x 15 feet wood and tin shack. This operation reportedly produced only 26 flasks of mercury. Each

Figure 1, Red Top Retort Site, near Aleknagik, Alaska

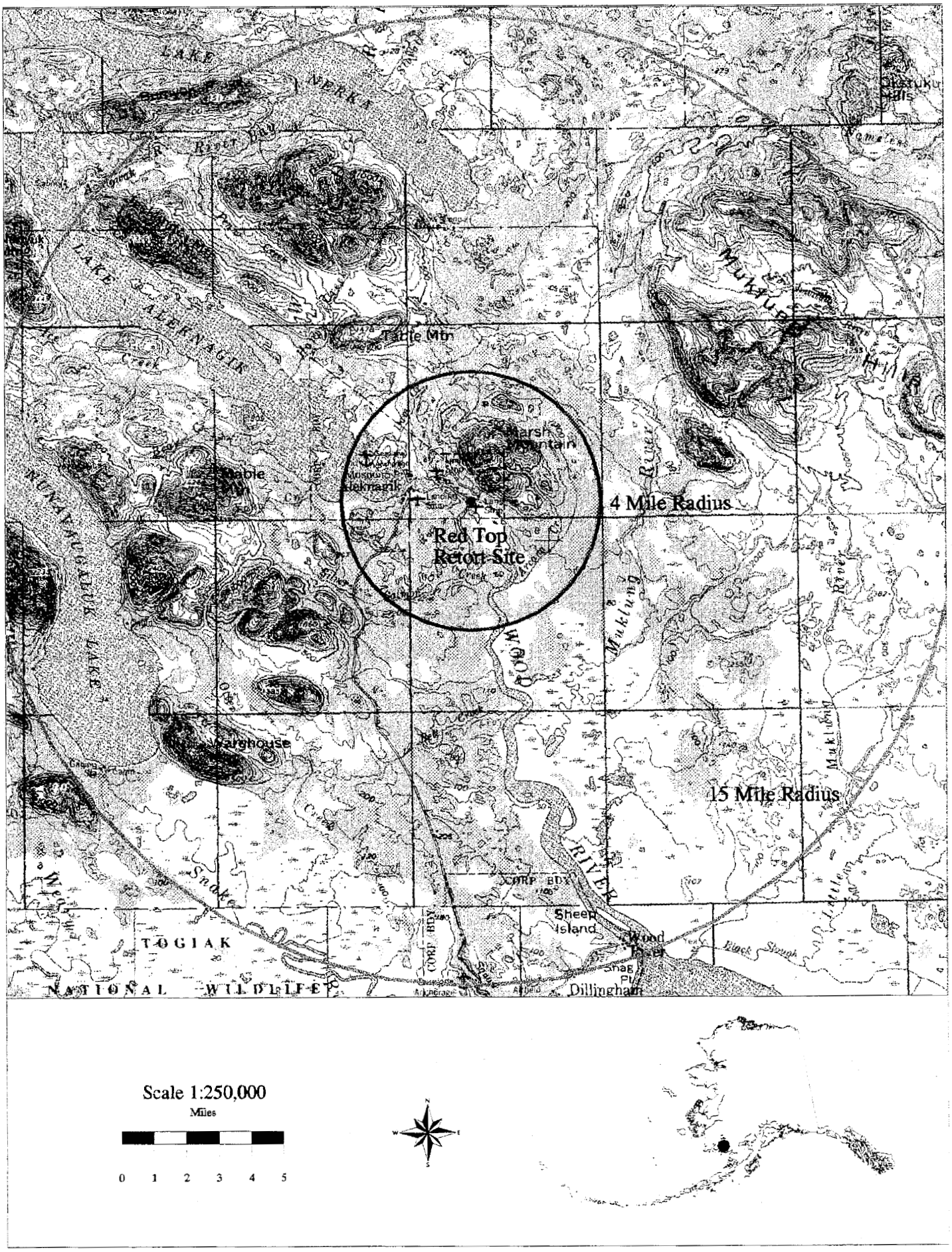
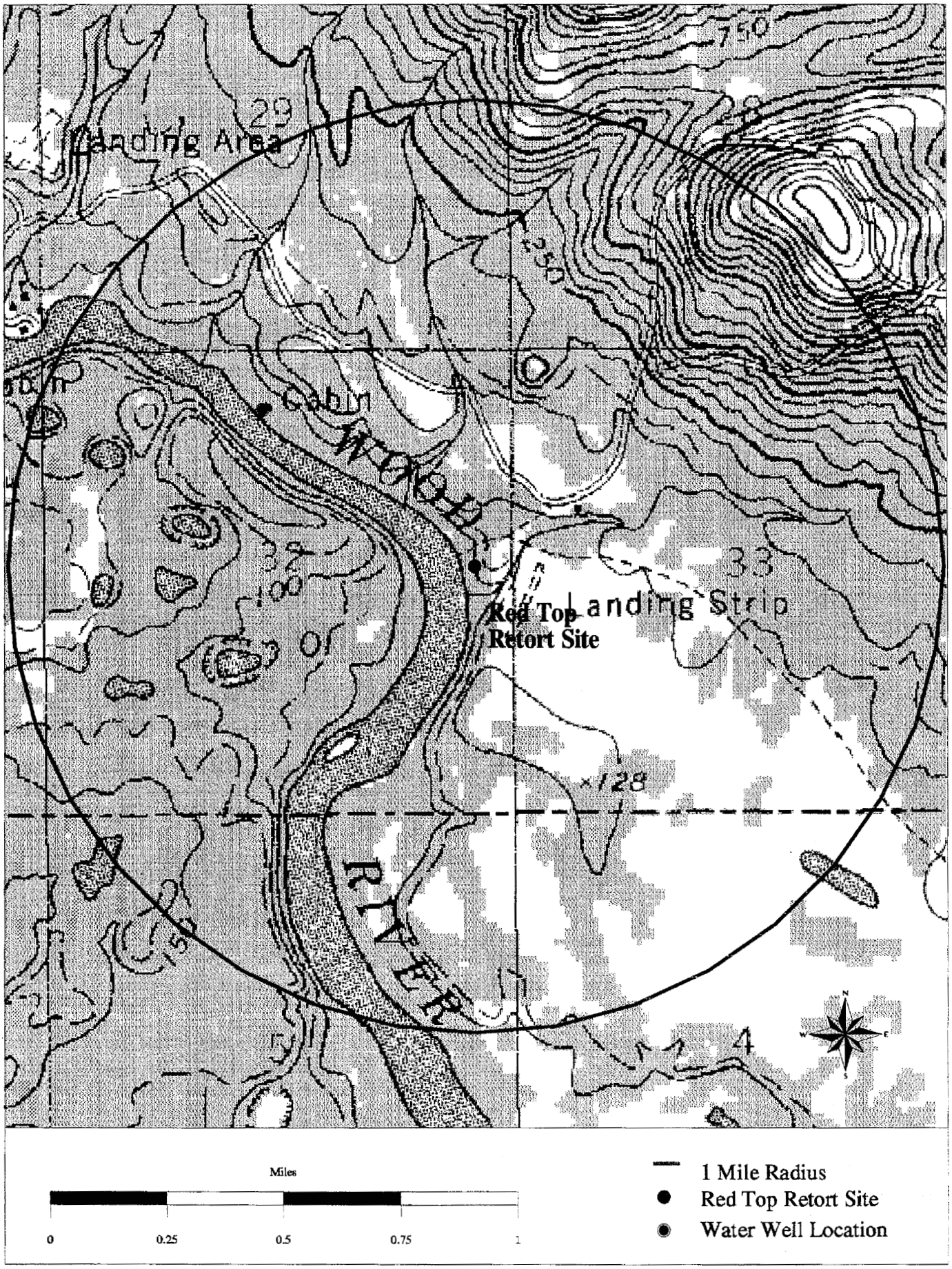


Figure 2, Red Top Retort Site and Water Wells within 1 mile



flask weighed 76 pounds. (Dynamac Corp., 1995, p. 8)

Fuel sources for the retort operation were wood and bunker-C fuel. Twenty-two drums containing various amounts of Bunker-C fuel oil were removed from the site in 1994 (AQE, 1995). Mercury and fuel contaminated soil was excavated and disposed of in 1994 and 1998 (AQE, 1995; HLA, 1998). In-situ soil analyses completed in 1998 from a sampling grid covering the Retort area showed the highest concentrations to be approximately 40 ppm total mercury and 27 ppm Diesel Range Organics (HLA,1998).

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*3) Provide a description of all aquifers beneath the site. Include description of overlying materials (i.e., hydraulic conductivity/permeability), thickness, composition and depth at which aquifer is first encountered. *NOTE: This data requirement involves a literature search of all current or existing geologic information.*

Aquifers beneath the site and within a one mile radius have not been described in scientific literature, nor are any well logs available for the area within a one-mile radius. The only known well within a one-mile radius of the site is located one-half mile up the Wood River at a private cabin (Figure 2). According to the owner, the well is only three feet deep in unconsolidated sediment near the river (Pat Kohler, oral commun., 1998). However, some logs are available for wells in Aleknagik and Dillingham, and geologic studies have been completed in the Dillingham and the Wood River-Tikchik Lakes area.

All data sources indicate surficial deposits up to 450 feet thick. Deposits are of glacial-fluvial-lacustrine origin, and vary widely in their distribution and sequences of gravel, sand, silt, and clay (U.S. Geological Survey, 1998, unpub. data; Palcsak and Dorava, 1994; Alaska Dept. Of Highways, 1976; Eakins, 1968). Sequences below the surficial deposits are shown in Table 1.

Extrapolating from available well data in Aleknagik, aquifers vary in depth from near-surface to 117 feet, with over-lying and interbedded aquitards containing silt and clay (U.S. Geological Survey, 1998, unpub. data).

Table 1, Generalized Stratigraphic Sequence of Rocks in Lower Kuskokwim-Bristol Bay Region, Alaska

Period	Unit	Character	Thickness (feet)
Quaternary	Surficial deposits	Gravel, sand, silt, clay	0-450+
Tertiary	Basalt	Olivine basalt flows	50-350+
Cretaceous	Kuskokwim Group	Graywacke, shale, conglomerate	20,000-30,000
Jurassic	Gemuk Group	Andesite and basalt flows, interbedded tuff, breccia, fine and course-grained sedimentary rocks.	15,000-30,000
Triassic			
Permian		Argillite, chert, greenstone,	
Carboniferous		Limestone, graywacke, tuff.	
Devonian	Limestone	Limestone, dolomite	800-1,200
Silurian	Unknown*		
Ordovician			
Cambrian			
Precambrian		Metamorphic rocks	

*Unconformities not shown From Eakins, 1968

Materials overlying the aquifers are surface soils consisting of peat and silty deposits as further described in response to question #11. Near surface soils and sediments at the site consist primarily of silt (AQE, 1994, 1995). The hydraulic conductivity of silt varies between 10^{-3} and 10^{-7} cm/s (Freeze and Cherry, 1979, p. 29). Regionally, the thickness, composition and depth at which an aquifer is first encountered varies from silts to gravels, and from near surface to 50 feet below ground surface (U.S. Geological Survey, unpub. data, 1998).

4) For each source, choose one description from Table 1 (Appendix 2, p. 6-7) that describes the ground water containment. Provide complete documentation (i.e., engineering diagrams, photographs {originals}) as to why the source meets that description and not any other in the table.

Table 1, All Sources, No liner.

Photos are included in each of the three reports submitted to EPA (HLA, 1998; AQE, 1994, 1995). These photos document site conditions before, during, and after removal actions.

Contaminants were released at the surface during the operation of the Retort between 1952 and 1955. Bunker-C fuel may have leaked from drums prior to the 1994 removal action. Test holes revealed that a natural clay and silt layer starts 4 to 12 inches below the surface and continues below the bottom of the 18 inch holes(AQE, 1994). These materials are known to form a natural barrier to water and contaminant flow. No contamination is known below the clay layer based on visual inspection, sample analyses, and geochemical mobility of mercury and DRO.

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5) Provide the location of all drinking water wells (by HRSII distance rings in table format) in all aquifers within a 4-mile radius from site (property boundary). Show on topo map all wells within 1-mile radius. Provide information on depth of well(s), screening interval(s), depth aquifer(s) encountered and population served. For multiple wells (i.e., municipal system) provide the number of wells, location of all wells (regardless of 4-mile limit), average annual pumpage of each well (regardless of 4-mile limit) and total population served by system. Include information on all standby wells.

See Table 2 and Figure 2. Federal and State agencies, community governments, and local citizens were contacted for data. Well screen intervals and aquifer depths are not available for this area.

According to the City of Aleknagik (Caroline Smith, oral and written commun., 1998), no municipal supply or multiple wells exist. Public wells listed in Table 2 are for individual public buildings and do not supply local residences.

Table 2. Wells within 4 miles of the Red Top Retort Site[1]

Miles from site	USGS Well number[2]	Owner	Depth (ft.)	Water level (ft.)	Use
1/2 to 1	none	Pat Kohler	3	-	domestic
1 to 2	none	Geneva Smith	~110	-	domestic
1 to 2	none	Mark Smith	~15	-	domestic
2	SC01005531BBBA1	Aleknagik Post Office	10	3.27	domestic
2	SC01005531BCCA1	Jim Carty	65	50.00	domestic
2 to 4	SC01005530CCBC1	unknown	16.5	12.50	unknown
2 to 4	SC01005625DADB1S	City of Aleknagik	-	27.00	public
2 to 4	SC01005625DDAA1	City of Aleknagik	118	-	public
2 to 4	SC01005625DDAD1	Roland Moody	35	-	domestic
2 to 4	SC01005636ACBD1S	Bavilla	-	39.08	domestic
2 to 4	SC01005636ACCA1	Pete Olson	57	-	domestic
2 to 4	SC01005636ACDB1	City of Aleknagik	50	-	public
2 to 4	SC01005636BDDA1S	City of Aleknagik	-	7.48	public
2 to 4	SC01005636CBBA1	City of Aleknagik	65	37.34	public
2 to 4	SC01005636DABA1	Aleknagik school	200	-	institutional

[1] Other wells are known to exist between 1-4 mile radius, but no data available.

[2] Also describes location: Meridian, Quadrant, Township, Range, Section, 1/4, 1/4,1/4,1/4.

Sources: USGS, Water Resources Div., 1998; Interviewed residents, 1998.

---

6) Provide information and location of wells within 4-miles (on topo map show all wells within 1-mile radius) that are used:

a) to irrigate 5 or more acres of commercial food or forage crops,

b) for watering of commercial livestock

c) as an ingredient in commercial food preparation

d) as a supply to aquaculture, or

e) as a supply for a major or designated water recreation area, excluding drinking water use.

There are no wells within 4 miles that are used for the above purposes.

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7) What is the average number of persons per residence (Borough, city, village, community, etc.) that site is located in.

The site is located in a remote area of Alaska. The area is not organized into boroughs. The closest village, Alekanagik (pop. 259), is about 1.5 miles up river. The City of Dillingham (pop. 2,252) is about 15 miles down river from the site (Alaska Department of Community and Regional Affairs, written commun., 1998).

---

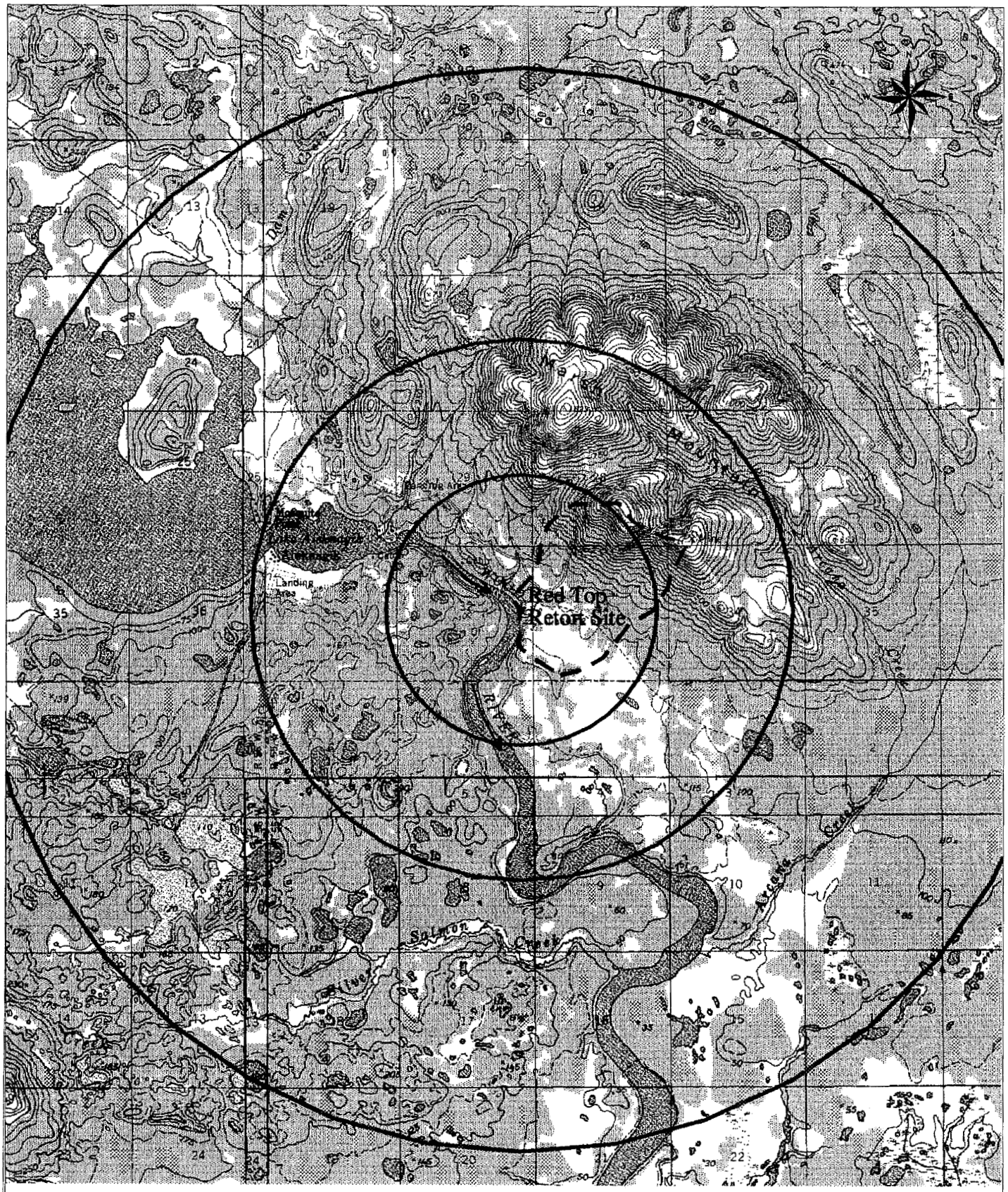
8) Identify and locate all surface water bodies within two miles of the site. Indicate the drainage routes (shown on topo map) from each source to applicable water bodies. Provide the average annual flow (cubic feet per second) for each surface water body within 15 miles downstream (river, stream, etc.) or 15-mile radius (lakes, bays, etc.) from the point of probable entry into surface water. For lakes, provide information on inflow and outflow.

See Figure 3.

Surface water bodies within 2 miles	Average annual flow ft^3/sec
Wood River	4,824*
Lake Aleknagik	4,824 outflow
34 small ponds	None

* USGS gaging station 15303000 is located at the outflow of Lake Aleknagik, which is the head water of the Wood River (Glass, 1987; Palcsak and Dorava, 1994; U.S. Geological Survey, written commun., 1998). No data available for inflow of Lake Aleknagik.

Figure 3, Surface Water near Red Top Retort Site



Miles

0 0.5 1 1.5 2

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4 Mile Radius

2 Mile Radius

1 Mile Radius

Drainage Basin Boundary

River Flow Direction

Red Top Retort Site

9) For each source, choose one description from Table 2 (Appendix 2, p. 7-8) that best describes the surface water containment. Provide complete documentation (i.e., engineering diagrams, original photographs) as to why the source meets that description and not any other in the table.

Table 2, All Sources, No evidence of hazardous substance migration from source area.

Analytical results of water and sediment from the Wood River near the site indicate that the levels of metals and hydrocarbons detected are similar to background levels or below (AQE, 1994; HLA, 1998). This region of Alaska has rich veins of cinnabar (mercury sulfide) that elevate background levels of mercury in streams and sediments(Gray and Sanzolone, 1996).

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10) What is the number of acres in each drainage basin?

The Red Top Retort Site resides in an unnamed drainage basin that encompasses 650 acres. The site is located at the toe of this drainage basin on the bank of the Wood River. The unnamed basin also lies within the Wood River drainage basin. The upper reaches of the Wood River has a drainage area of approximately 712,000 acres at Aleknagik (USGS stream-gaging station No. 15303000), (Glass, 1987).

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11) From Table 3 (Appendix 2, p. 8), choose the predominant soil group (surface soil) which comprises the largest total area within each drainage area.

Table 3, Moderately fine-textured soils with low infiltration rates.

The soils of the Wood River drainage area vary from poorly drained to well drained (Rieger, 1965). The soils are generally consist of a thick layer of silty windlaid material blown from unvegetated flood plains and hills adjacent to melting glaciers, and volcanic ash from the Aleutian Range. Other area soils are dominated by accumulations of peat that may remain perennially frozen 15 to 30 inches below the surface.

Before site excavation, the site soils were silty with several inches of peat cover (AQE, 1994). The remedial activities in 1994 and 1998 removed most of the overlying peat, along with several inches to 2 feet of the underlying silty gravel bar deposits. In addition to the regional morphogenic influences listed above, the site is inundated with silty flood waters every several years (Pat Owens, oral commun., 1998).

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12) What is the 2-year, 24-hour rainfall? What is the Annual Net Precipitation?

The 2-year, 24-hour rainfall in the area is 2 inches (Miller, 1963). The annual net precipitation is about 30 inches (Oregon State University, Oregon Climate Service, written commun., 1998). Miller, (1963), and the Oregon Climate Service were cited as the best, if not sole source, for this specific area by Dwight Pollard, State Climatologist, Alaska State Climate Center.

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*13) From Table 4 (Appendix 2, p. 8), choose the floodplain category for each source (supply Federal Emergency Management Agency or U.S. Army Corps of Engineers floodplain map) and determine if each source meets the criteria from Table 5 (*Appendix 2, *p. 9).*

Table 4, Flood Plain Categories: Source in 10-year flood plain.

BLM checked availability of flood maps and data from the U.S. Army Corps. Of Engineers-Anchorage District (Harlan Legar, oral commun., 1998), and the Federal Emergency Management Agency (FEMA)(written commun., 1998). No specific flood information is available for this remote area. The closest FEMA flood map covers the Dillingham area, about 15 miles down river. By extrapolation, the retort site would fall within a 100 year flood plain due to its river bank location. The site is further defined by knowledge of BLM personnel and local residents. The site was flooded in late May through early June, 1998. No flooding of the site had occurred since at least 1993.

Table 5, Flood Containment: The site is not designed to prevent a washout of hazardous substances by flood.

Hazardous substances and contaminated soils were removed (AQE,

1995; HLA, 1998). Residual in-situ soil analyses (1998) taken from a sampling grid covering the Retort area showed the highest concentrations on-site to be approximately 40 ppm total mercury, and 27 ppm Diesel Range Organics (HLA,1998).

---

14) Provide the location (by HRSII distance rings in table format) of all drinking water intakes within 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.). Show on topo map all intakes within 1-mile radius/downstream. Provide information on population served. For multiple intakes (i.e., municipal system) provide information on the number of intakes, location of all intakes (regardless of 15-mile limit), average annual pumpage of each intake (regardless of 15-mile limit), and total population served by system. Include information on all standby intakes.

There are no known drinking water intakes within a 15 mile radius of the site according to the City of Aleknagik, City Administrator (Caroline Smith, oral commun., 1998), and the City of Dillingham, Department of Public Works (Andrea Horn, oral commun., 1998). Most area residents have individual water wells. Based on the rural setting and economic status of local inhabitants, it is reasonable to assume that at least a few households use river water for drinking. However, intakes would most probably be at least 1.5 miles up river (Aleknagik) or about 15 miles down river (Dillingham), based on the known distribution of inhabitants.

---

*15) Provide information and location of intakes within 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.) that are used:**

a) to irrigate 5 or more acres of commercial food or forage crops,
b) for watering of commercial livestock,
c) as an ingredient in commercial food preparation,
d) as a supply for aquaculture, or
e) as a supply for a major or designate water recreation area, excluding drinking water use.

**On topo map show location of intakes within 1-mile radius/downstream.*

According to the City of Dillingham, Department of Public Works (Andrea Horn, oral commun., 1998) and the City of Aleknagik, City Administrator (Caroline Smith, oral commun., 1998), there are no known water intakes for the uses listed above in the Dillingham or Aleknagik area. The Alaska Agriculture Statistics Service reports that their search revealed no commercial agricultural activities within the 15 mile radius of the site. One commercial farm exists outside the 15-mile radius near Dillingham. It is less than 50 acres, has no livestock, and uses greenhouses to grow vegetables.

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16) What is the average human food chain production (pounds per year per acre) for each surface water body within 15 miles downstream (rivers, streams, etc) or 15-mile radius (lakes, bays, etc)?

The Alaska Department of Fish and Game (ADFG)provided information on the estimated annual total weight of species that are harvested within a 15 mile radius of the site. The species include: Chinook, Coho, Sockeye, Pink, and Chum salmon; Dolly Varden and Arctic char; Rainbow trout, Grayling, Whitefish, Pike, and Smelt. The estimated annual total weight harvested for all species is 9,751 pounds (Dan Dunaway, written commun., 1998). According to a Bureau of Land Management wildlife biologist, this weight provides the best possible estimate available of actual fish consumption from this area (Bruce Seppi, oral commun., 1998).

The approximate surface water area within a 15 mile radius of the site is 100,100 acres.

$$\frac{9{,}751 \text{ pounds}}{100{,}100 \text{ acres}} = \sim 0.1 \text{ pound/acre.}$$

Another consideration for the calculation of this number could include transient salmon populations. The Wood River, and the lakes above it, are the primary salmon nurseries for the Bristol Bay area, one of the major salmon fisheries in Alaska. The Wood River provides a corridor for the salmon to reach the ocean and return to the lakes to spawn (Bruce Seppi, oral commun., 1998). ADFG count adult Sockeye salmon about a mile up river from the site. Sockeye is by far the dominant species with respect to pounds of live fish. ADFG calculated approximately 22.4 million pounds of fish protein production for Sockeye passing through the Wood River (James Browning, written commun., 1998).

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17) Identify all sensitive environments (Table 6, Appendix 2, *p. 9) that exist within a 4-mile radius on land, 15 miles downstream (rivers, streams, etc), or 15 mile radius (lakes, bays, etc, in HRSII distance ring table format. Provide original documentation (U.S. Fish and Wildlife, Natural Heritage Database, State agencies, National Oceanic and Atmospheric Administration, etc) and locate each environment within 1-mile on a topo map. Note that there could be multiple sensitive environments within the appropriate limit.*

See Figure 2 for 1-mile radial view of site.

Table 6, Sensitive Environments:

1. Spawning areas critical for the maintenance of fish/shellfish species within river, lake, or coastal waters.
And
2. Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal waters in which the fish spend extended periods of time.

According to an ADFG biologist, "the Wood River is an important spawning site for Sockeye, Chum, Pink, (and) possibly Coho salmon; and smelt... some Grayling, Rainbow trout, Char/Dolly Varden, and Pike spawn in the 15 mile radius" (Dan Dunaway, written commun., 1998). Furthermore, ADFG states, "the Wood River corridor provides nesting habitat for (numerous) species of passerines as well as feeding habitat for shorebirds and other aquatic species... several species of terrestrial mammals occupy the area including river otter, mink, beaver, wolf, coyote, weasel, fox, moose and caribou" (James Browning, written commun., 1998).

3. State land designated for wildlife or game management.

The Wood-Tikchik State Park occupies the area north of the site. The State controls hunting on these lands through the Alaska Department of Natural Resources.

According to the Alaska Natural Heritage Program (AKNHP) (Julia Lenz, written commun., 1998), "there are no federal or state listed threatened, endangered, or sensitive plants, animals, or communities" in this area. However, AKNHP notes that there may be several species of plants and animals that AKNHP consider sensitive (Appendix).

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*18) What is the linear frontage (miles) of all wetlands 15 miles downstream (rivers, streams, etc) or 15-mile radius (lakes, bays, etc)? *All sides of water body.*

The downstream linear frontage of wetlands is 30 miles according to the connotative definition in the question.

During a National Environmental Policy Act (NEPA) Environmental Assessment (EA) (EA#: AK-040-98-020) completed for a removal action at the site, it was clearly stated that "the river bank is a riparian zone; the site does not have designated or known wetlands." The river banks generally do not fit the classical definition of a wet-land, that being a marsh, bog, swamp, or fen (Horne and Goldman, 1994, p.408). The river banks do experience fluctuations in water levels, and thus water coverage, due to seasonal discharge fluctuations and tidal influences.

No wetlands map exists for the land the site occupies. However, the U.S. Fish and Wildlife Service has produced a map for the Dillingham (A-7), Alaska quadrangle, which covers the downstream portion of the Wood River (Figure 4).

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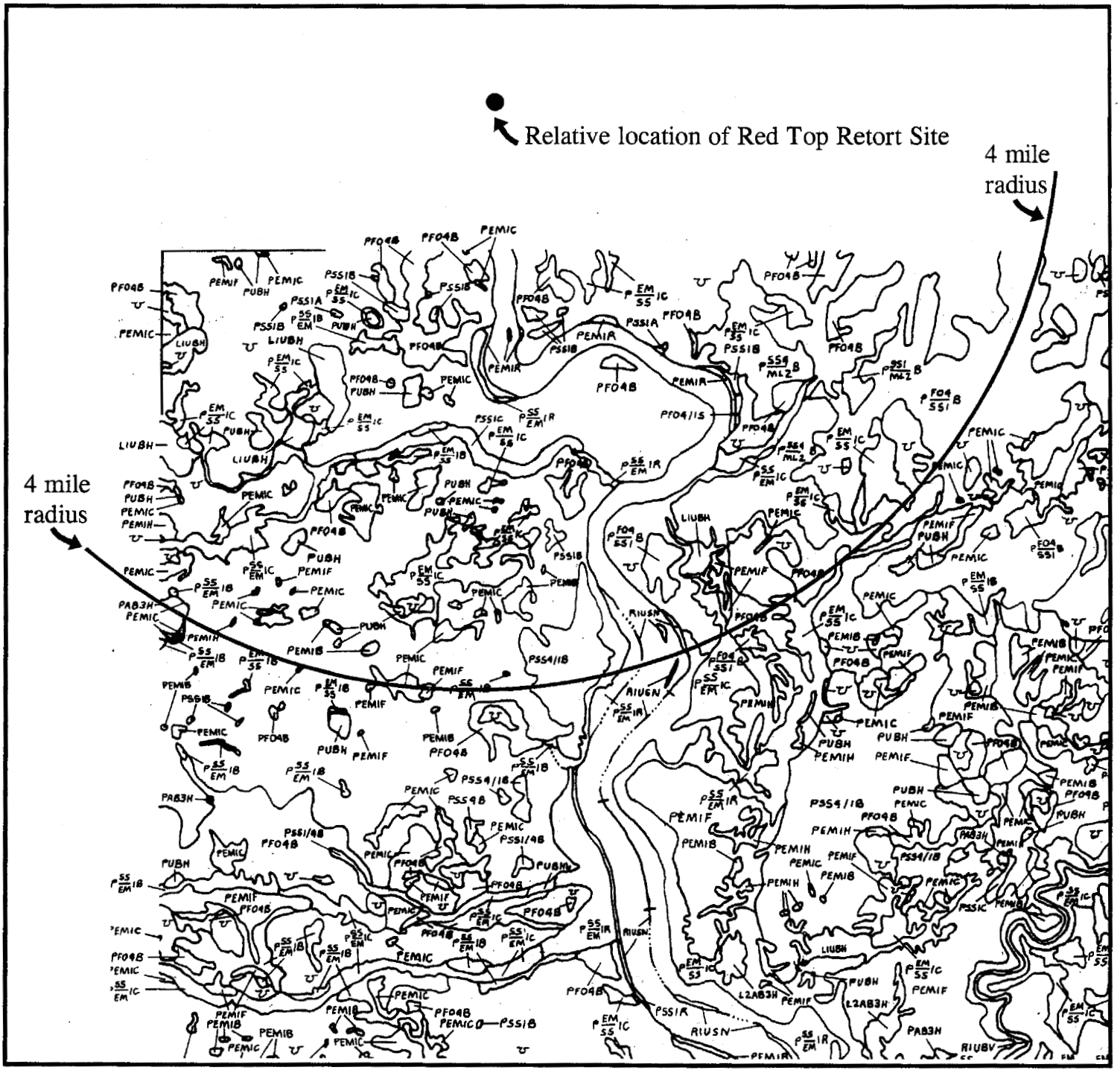
19) What is the location and number of persons residing, working, attending school or day care within 200 feet of each source?

Zero.

Figure 4

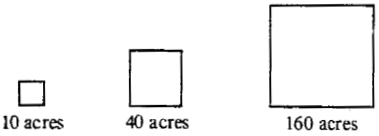
NATIONAL WETLANDS INVENTORY

(U.S. Fish and Wildlife Service, 1983)



NW section of Dillingham (A-7), Alaska

Acreage Guide



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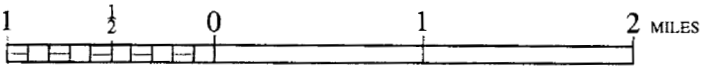


Symbology Example

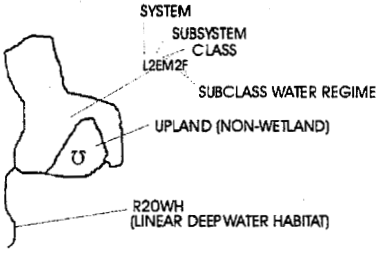


Figure 4a. Classification Scheme for National Wetlands Inventory

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL

- **CLASS:** RB — ROCK BOTTOM
  - Subclass: 1 Bedrock; 2 Rubble
- **CLASS:** UB — UNCONSOLIDATED BOTTOM
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic
- **CLASS:** AB — AQUATIC BED
  - Subclass: 1 Algal; 3 Rooted Vascular; 5 *Unknown Submergent*
- **CLASS:** RF — REEF
  - Subclass: 1 Coral; 3 Worm
- **CLASS:** OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM: 2 — INTERTIDAL

- **CLASS:** AB — AQUATIC BED
  - Subclass: 1 Algal; 3 Rooted Vascular; 5 *Unknown Submergent*
- **CLASS:** RF — REEF
  - Subclass: 1 Coral; 3 Worm
- **CLASS:** RS — ROCKY SHORE
  - Subclass: 1 Bedrock; 2 Rubble
- **CLASS:** US — UNCONSOLIDATED SHORE
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic

SYSTEM: R — RIVERINE

SUBSYSTEM: 1 — TIDAL

- **CLASS:** RB — ROCK
  - Subclass: 1 Bedrock; 2 Rubble
- **CLASS:** UB — UNCONSOLIDATED BOTTOM
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic
- **CLASS:** AB — AQUATIC BED
  - Subclass: 1 Algal; 2 Aquatic Moss; 3 Rooted Vascular; 4 Floating Vascular; 5 *Unknown Submergent*; 6 *Unknown Surface*
- **CLASS:** US — UNCONSOLIDATED SHORE
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic; 5 Vegetated
- **CLASS:** **EM — EMERGENT
  - Subclass: 2 Nonpersistent
- **CLASS:** OW — *OPEN WATER/ Unknown Bottom*

SUBSYSTEM: 2 — LOWER PERENNIAL

- **CLASS:** *SB — STREAMBED
  - Subclass: 1 Bedrock; 2 Rubble; 3 Cobble-Gravel; 4 Sand; 5 Mud; 6 Organic; 7 Vegetated

SUBSYSTEM: 3 — UPPER PERENNIAL

- **CLASS:** RS — ROCKY SHORE
  - Subclass: 1 Bedrock; 2 Rubble

SUBSYSTEM: 4 — INTERMITTENT

- **CLASS:** *SB — STREAMBED
  - Subclass: 1 Bedrock; 2 Rubble; 3 Cobble-Gravel; 4 Sand; 5 Mud; 6 Organic; 7 Vegetated

SUBSYSTEM: 5 — UNKNOWN PERENNIAL

- **CLASS:** *SB — STREAMBED
  - Subclass: 1 Bedrock; 2 Rubble; 3 Cobble-Gravel; 4 Sand; 5 Mud; 6 Organic; 7 Vegetated

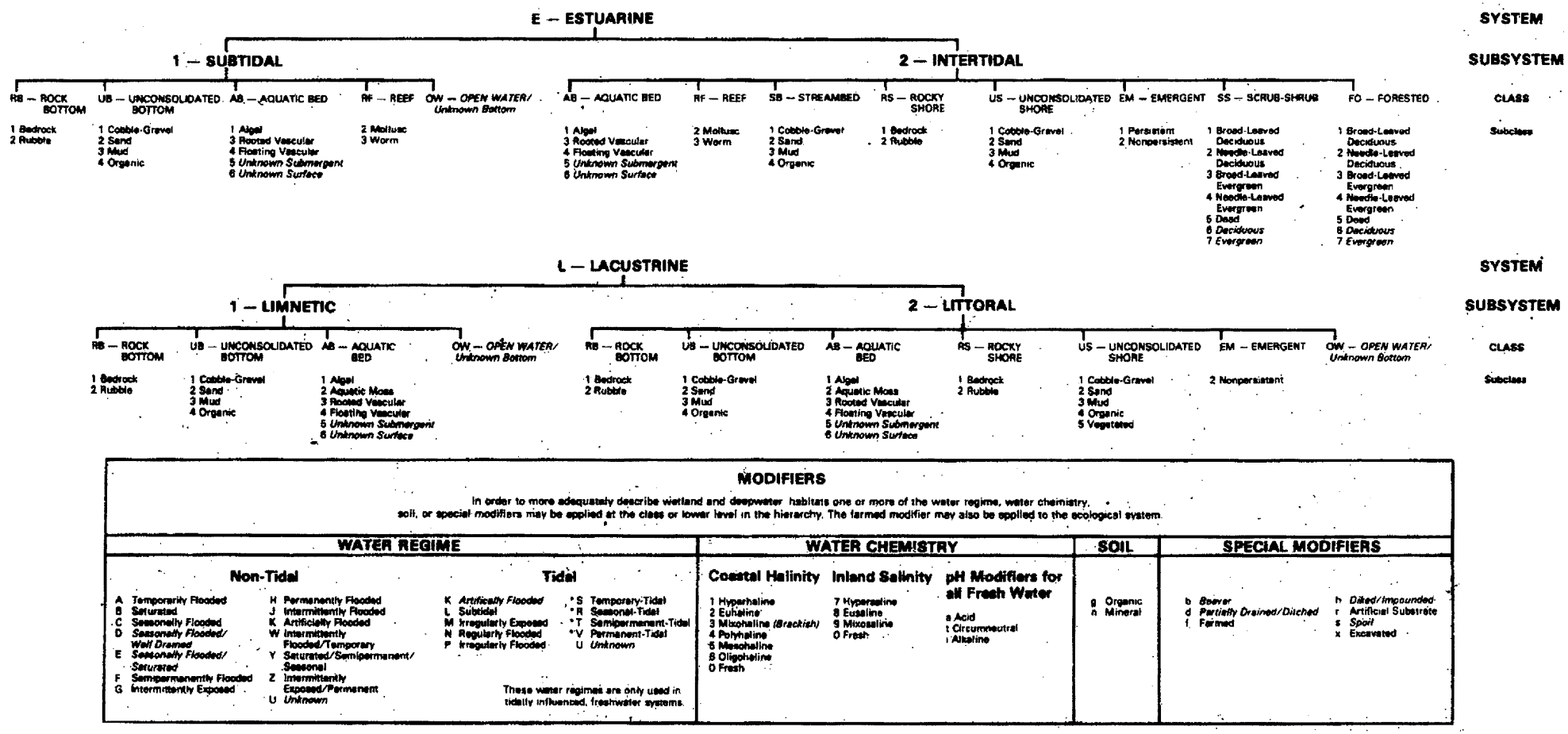
*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS

SYSTEM: P — PALUSTRINE

- **CLASS:** RB — ROCK BOTTOM
  - Subclass: 1 Bedrock; 2 Rubble
- **CLASS:** UB — UNCONSOLIDATED BOTTOM
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic
- **CLASS:** AB — AQUATIC BED
  - Subclass: 1 Algal; 2 Aquatic Moss; 3 Rooted Vascular; 4 Floating Vascular; 5 *Unknown Submergent*; 6 *Unknown Surface*
- **CLASS:** US — UNCONSOLIDATED SHORE
  - Subclass: 1 Cobble-Gravel; 2 Sand; 3 Mud; 4 Organic; 5 Vegetated
- **CLASS:** ML — MOSS-LICHEN
  - Subclass: 1 Moss; 2 Lichen
- **CLASS:** EM — EMERGENT
  - Subclass: 1 Persistent; 2 Nonpersistent
- **CLASS:** SS — SCRUB-SHRUB
  - Subclass: 1 Broad-Leaved Deciduous; 2 Needle-Leaved Deciduous; 3 Broad-Leaved Evergreen; 4 Needle-Leaved Evergreen; 5 Dead; 6 *Deciduous*; 7 *Evergreen*
- **CLASS:** FO — FORESTED
  - Subclass: 1 Broad-Leaved Deciduous; 2 Needle-Leaved Deciduous; 3 Broad-Leaved Evergreen; 4 Needle-Leaved Evergreen; 5 Dead; 6 *Deciduous*; 7 *Evergreen*
- **CLASS:** OW — *OPEN WATER/ Unknown Bottom*

Figure 4b. Classification Scheme for National Wetlands Inventory



20) Identify all terrestrial sensitive environments (Table 7, page 10) that exist on-site. Provide original documentation (U.S. Fish and Wildlife, Natural Heritage Database, State agencies, National Oceanic and Atmospheric Administration, etc) and locate each on a topo map. Note that there may be multiple sensitive environments within the site limits/boundaries.

The Red Top Retort Site does not have any terrestrial sensitive environments as listed in Table 7.

Furthermore, the site was evaluated for impacts to threatened and endangered species during a National Environmental Policy Act (NEPA) Environmental Assessment (EA) (EA#: AK-040-98-020), and found not to be a threat.

---

21) For each source, choose one description from Table 8 (Appendix 2, *p. 10) that describes the accessibility of the site. Provide complete documentation (i.e., engineering diagrams, original photographs) as to why the source meets that description and not any other in the table.*

Table 8, Slightly accessible.

The site is extremely rural, with no overland link beyond Aleknagik. An unimproved track from Aleknagik can be used to access the site on foot or via an All-Terrain Vehicle. The easiest access to the site is via a small boat on the Wood River.

---

22) What is the total number of people within the following distance categories?:

0-1/4 mile
1/4-1/2 mile
½-1 mile
1-2 miles
2-3 miles
3-4 miles

Use current/available Census data and/or actual house counts. Document how calculated.

Distance	# of people
0-1/4 mile	zero
1/4-1/2 mile	3 (estimated; one cabin in this zone)
½-1 mile	zero
1-2 miles	50 (estimated outlying population of Aleknagik)
2-3 miles	206
3-4 miles	zero

Numbers were determined by examining aerial photos, topographic maps, visual reconnaissance during site visits, and through discussions with local inhabitants. The Alaska Department of Community and Regional Affairs determined in November, 1998 that the current population of Aleknagik is 259 (written commun., 1998). The 2-3 mile zone was determined by subtracting 50 (1-2 miles) and 3 (1/4-1/2 mile) from 259.

---

*23) For each source, choose one description from Table 9 (*Appendix 2, *p. 10) that describes the gaseous containment. From Table 10 (*Appendix 2, *p. 11), choose the appropriate description of each source type. For each source, choose one description from Table 11 (*Appendix 2, *p. 11) that describes the particulate containment. Provide complete documentation (i.e., engineering diagrams, original photographs) as to why the source meets that description and not any other in the table.*

Table 9, Uncontaminated soil cover <1 foot [or more], Other.

Soil gases were monitored during the 1998 Removal Action (HLA, 1998) and no hazardous gases were detected from in-situ soils. The air was monitored for mercury vapor and Volatile Organic Compounds. The site was heavily vegetated (grasses and trees) before the 1994 Removal Action, and grass covered before the 1998 Removal Action (AQE, 1994; HLA, 1998). During the 1994 and 1998 removal actions, a reinforced liner was placed in the bottom of the excavation before clean soils were backfilled into the pit.

The excavation depth varied from about 6 to 30 inches.

Table 10, Source type: Other types of sources, not elsewhere specified.

The source was an accidental surface release of elemental mercury and fuel oil.

Table 11, Particulate containment description: Uncontaminated soil <1 foot [or more]. See description for Table 9 above.

---

24) What is the location and area (in acres) of all wetlands within 4 miles of the site?

Based on the National Wetlands Inventory Map (Dillingham, A-7, Alaska) compiled by the U.S. Fish and Wildlife Service (Figure 4), and adjoining topographic maps, it is estimated that roughly 15 percent of the area within 4 miles of the site may be wetlands. The highest density of wetlands is in the southern portion of this area, while the area to the north and east are mostly uplands or mountainous, and the west is dominated by Lake Aleknagik.

---

25) Contact EPA Regional Office immediately if any radionuclides are present or suspected at site and supply all radiological information known to date. Have any removals or remedial actions taken place at site? If yes, then submit ALL information pertaining to action taken.

No radionuclides are present or suspected at this site. Non-radionuclide related removal actions occurred in 1994 and 1998 as described above (AQE, 1995; HLA, 1998).

---

26) For all of the above information, use primary data sources and supply 2 copies or specify where copies may be obtained.

Complied with. All sources referenced according to U.S. Geological Survey publication standards.

---

27) Has any of the above information been previously submitted to the EPA Superfund Program? If yes, please specify the reference (page and paragraph) or provide a copy of the document.

Yes, as specified in question #1:

This information has been sent to EPA, Region X in the following reports:

1. Remedial Action Report, Red Top Retort Site, 1998, Harding Lawson and Associates, Inc.

2. Remedial Action Report: BLM Red Top Retort Site, Wood River, Alaska, Volume 1 & 2, 1995, AQE.

3. Site Assessment Report: BLM Red Top Retort Site, Wood River, Alaska, Volume 1 & 2, 1994, AQE.

REFERENCES

Alaska Dept. Of Highways, 1976, Materials site report, Dilingham-Kanakanak, project S-0411(4)/B41022, variously paged.

AQE, 1995, Remedial Action Report: BLM Red Top Retort Site, Wood River, Alaska, Volume 1 & 2: Bureau of Land Management, Anchorage Field Office, variously paged.

AQE, 1994, Site Assessment Report: BLM Red Top Retort Site, Wood River, Alaska: Bureau of Land Management, Anchorage Field Office, variously paged.

Dynamac Corp., 1995, Final Potentially Responsible Party Search, Red Top Mill Site, Dillingham, Alaska: Bureau of Land Management, Anchorage Field Office, variously paged.

Eakins,G.R., 1968, A geochemical investigation of the Wood River-Tikchick Lakes area, southwestern Alaska: Alaska Dept. Of Natural Resources, Geochemical report no. 17, 31 p.

Freeze, R.A. and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice-Hall, Inc., 604 p.

Glass, R.L., 1987, Water resources near Dillingham in the Bristol Bay area, Alaska: U.S. Geological Survey Water Resources Investigation Report 87-4141, 27 p.

Gray, J.E. and Sanzolone, R.F., eds., 1996, Environmental studies of mineral deposits in Alaska: U.S. Geological Survey Bulletin 2156, 40 p.

HLA, 1998, Remedial Action Report, Red Top Retort Site: Bureau of Land Management, Anchorage Field Office, variously paged.

Horne, A.J. and Goldman, C.R., 1994, Limnology (2nd ed.): New York, McGraw-Hill, Inc., 576 p.

Miller, J.F., 1963, Probable maximum precipitation and rainfall-frequency data for Alaska: U.S. Dept. of Commerce Weather Bureau, Technical Paper no. 47, p. 64.

Palcsak, B.B. and Dorava, J.M., 1994, Overview of environmental and hydrogeologic conditions at Dillingham, Alaska: U.S. Geological Survey, open-file report 94-482, 15 p.

Rieger, Samuel, 1965, Soils of the Dillingham area, Alaska: U.S. Department of Agriculture, Soil Conservation Survey, 18 p.

Appendix 1

Selected Written Communications

FAX TRANSMITTAL

U.S. Geological Survey
Water Resources Division
Alaska District
Office: (907) 786-7100
FAX: (907) 786-7150

TO: MIKE ALCORN

OFFICE: BLM

FAX PHONE: 267-1304

OFFICE PHONE:

DATE: 12-16-98

PAGES: Header Plus 2 Sheets

FROM: PAT STAELAKOS PHONE: 786-7126

PLEASE CONFIRM RECEIPT OF THIS FAX	____Yes	____No

REMARKS: DRILL LOGS FOR TWO ALEKNAGIK WELLS;
SC 10-55-31BCCA1-2
SC 10-56-25DDAA1-3

SC 10-55-31 ... #80213

Jim's Drilling
BOX 103
DILLINGHAM, ALASKA
PHONE 842-3977

DRILLING LOG

Well Owner Jim Carty Use of Well ~~Home~~

Location (address of; Township, Range, Section; if known; or distance main road
South Side of Lake Nushagak

Size of casing 5" Depth of Hole 65' feet Cased to 65 feet

Static water level 50 ft. (above) (below) land surface. Finish of well (check one)
open end (✓) screen ( ) perforated ( ).
Describe screen or perforation

Well pumping test at 13 gallons per (hour) (minute) for 12 hours with no ft. of drawdown from static level.

Date of completion July 15 1978

WELL LOG

Depth in feet from ground surface	Give details of formations penetrated, size of material, color & hardness
0' TO 10'	3' Top Soil, Gravel + Rock
10' TO 15'	Fine Sand + Red Clay
15' TO 20'	Red Clay + Gravel + Rock
20' TO 25'	Gravel + Rock
25' TO 30'	" "
30' TO 35'	" "
35' TO 40'	" "
40' TO 45'	" "
45' TO 50'	" "
50' TO 55'	" " Water at 50' 1-5
55' TO 60'	Gravel + Sand 2-6
60' TO 65'	" " 3-7
TO	Install test Pump July 15' Pumped till
TO	Noon Sunday 16th, Pumping 13 G.P.M.
TO	Good water.
	Rock to 4" Dia. from Start to Ending

SC 10-55-31 BCCA1-2 / 59160 8/58 37070 1

THIS IS THE [illegible] DEEP PIPE AND TECHNIQUE FOR INSTALL [illegible] 40 feet. PUT THE PITLESS ADAPTER 5" ABOVE THE TOP OF THE CASING. [illegible] TO SECURE THE SAFETY CATCH AROUND THE TOP OF THE PUMP.

13'3"
-10 4

WELL LOG

U.S. PUBLIC HEALTH SERVICE, DIVISION OF INDIAN HEALTH

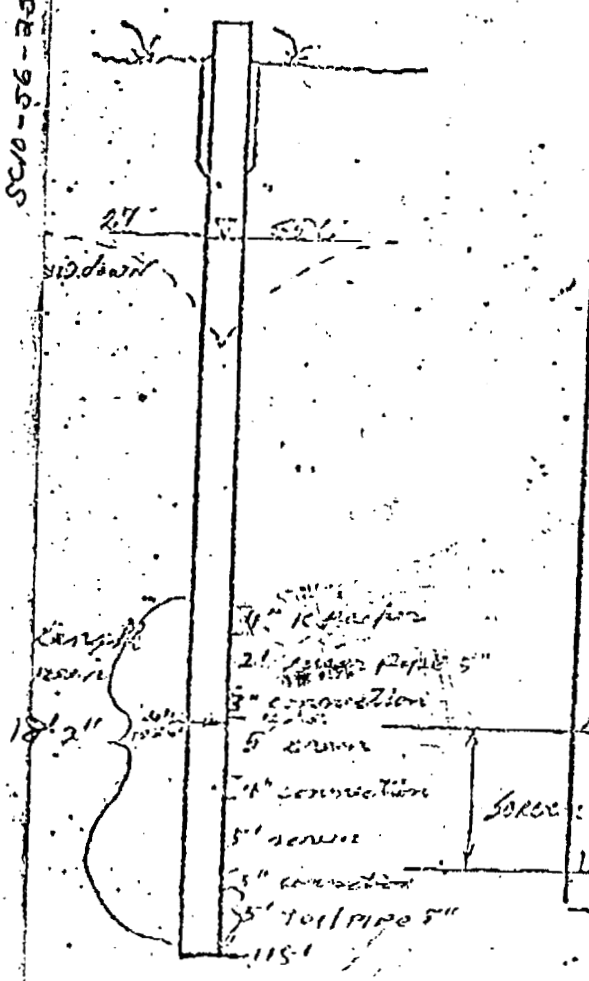
LOCATION Alakanuk DATE STARTED May 30, 1974

DATE COMPLETED June 15, 1974 DRILLER [illegible]

TOTAL DEPTH OF WELL 118' FT. CASING INSTALLED 104'9" screen 113'2" DIAMETER 6"

GROUT — SCREEN SIZE 40 MFG Johnson LENGTH 16'

STATIC WATER LEVEL 27' from surface HRS. PUMPED 25 @ 17 GPM. DRAWDOWN 9"



DATE	DEPTH FROM - TO	FORMATION	DRILLER
	0 - 18	sand, gravel & some limestone	
	18 - 24	clay, sand, gravel & small limestone	
	24 - 29	clay & sand	
	29 - 31	clay, gravel, & gravel	
	31 - 34	cemented gravel	
	34 - 49	clay, sand, & gravel	
	49 - 50	silt, sand, & gravel trace of water	
1-8	50 - 91	silt, clay, sand, & gravel (clay & water)	
1-9	91 - 95	clay, sand, & gravel water bearing	
1-10	95 - 117	sand & gravel water bearing	
	117 - 118	clay	

SPECIAL NOTES:

Development
surging & sand pumping
Bailing / 25 GPM
test pumping / 17 GPM

School operate
Fe 0.02 ppm
Hard 87

SC10-56-35DDA41-3 / 59/6 42158 371801

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPARTMENT OF COMMUNITY AND REGIONAL AFFAIRS

MUNICIPAL & REGIONAL ASSISTANCE DIVISION

☐ 333 W. 4TH AVENUE, SUITE 220
ANCHORAGE, ALASKA 99501-2341
PHONE: (907) 269-4500
FAX: (907) 269-4539

☒ P.O. BOX 112100
JUNEAU, ALASKA 99811-2100
PHONE: (907) 465-4750
FAX: (907) 465-2948

☐ P.O. BOX 348
BETHEL, ALASKA 99559-0348
PHONE: (907) 543-3475
FAX: (907) 543-4152

☐ 209 FORTY MILE AVENUE
FAIRBANKS, ALASKA 99701-3110
PHONE: (907) 452-7126
FAX: (907) 451-7251

☐ P.O. BOX 950
KOTZEBUE, ALASKA 99752-0350
PHONE: (907) 442-3696
FAX: (907) 442-2402

☐ P.O. BOX 790
DILLINGHAM, ALASKA 99576-0790
PHONE: (907) 842-5135
FAX: (907) 842-5140

☐ P.O. BOX 1068
NOME, ALASKA 99762-1068
PHONE: (907) 443-5457
FAX: (907) 443-2409

November 16, 1998

Carolyn Smith, Administrator
City of Aleknagik
P.O. Box 33
Aleknagik, AK 99555

RE: FY 2000 State Revenue Sharing and Safe Communities Program Population Adjustment

Dear Ms. Smith:

My staff have reviewed the City's request for adjustment to its 1998 preliminary population determination. The Head Count Census documentation requirements were met, and your request has been approved.

The department will use a population of **259** for the City of Aleknagik for FY 2000 State Revenue Sharing and Safe Communities Program purposes.

Please feel free to call Bill Rolfzen, State Revenue Sharing Administrator, at 907-465-4733, or Laura Walters, Research Analyst, at 907-465-4752 if you have any questions.

Sincerely,

Pat Poland (pm)
Director

cc: Deborah Tennyson, Local Government Specialist III, Dillingham Office
Bill Rolfzen, State Revenue Sharing Administrator, Juneau Office
Laura Walters, Research Analyst, Juneau Office
Department of Community and Regional Affairs

Alaska Natural Heritage Program

University of Alaska Anchorage – Environment and Natural Resources Institute
707 A Street Anchorage, AK 99501 – Tel: (907) 257-2780 Fax: (907) 2572789

December 11, 1998

Harrison Griffin
BLM-AK-AFO
6881 Abbott Loop Road
Anchorage, AK 99507

Dear Mr. Griffin,

This letter is in response to your request for information on any sensitive terrestrial or aquatic environments at a former hazardous materials site in the Aleknagik, Alaska area. More specifically, within a 4 mile radius for terrestrial and a 15 mile radius for aquatic. The information provided here is concluded after a thorough search of our databases for any sensitive species or communities that we have cataloged. This is the best information we can provide at this time without performing a thorough ground survey of the area of interest.

The Alaska Natural Heritage Program (AKNHP) has no federal or state listed threatened, endangered, or sensitive plants, animals, or communities to report for your area of interest. However, there are several species of both plants and animals, which are considered sensitive by the AKNHP, and could potentially occur in your area of interest depending on the habitat type. The plants and animals are listed below in this letter. The Global (Grank) and State (Srank) ranks which AKNHP assigns to the various species we track are given. The ranks run from 1 to 5 with a 1 indicating a very rare species and a 5 indicating a secure species. If you are unfamiliar with our system please refer to the attached sheet which defines the ranks.

Animals:

American peregrine falcon (*Falco peregrinus anatum*): Listed as endangered by the U.S. Fish and Wildlife and as a species of concern by the state of Alaska. Ranked by AKNHP as G4T3 and S3B. Habitat: Nests throughout forested areas of interior Alaska, mainly on cliffs along rivers or near lakes.

Gray-cheeked thrush (*Catharus minimus*): Listed as species of concern by the state of Alaska. Ranked by AKNHP as G5 S3B. Habitat: Boreal forests and wooded areas, conifer stands, dense alder, willows. Nest low on trees or in bushes.

Blackpoll warbler (*Dendroica striata*): Listed as species of concern by the state of Alaska. Ranked by AKNHP as G5 S3B. Habitat: Coniferous forest, nests low on trees or under spruce.

Plants:

Primula tschuktschorum (Chukchi primrose): Not on any state or federal lists. Ranked by the AKNHP as G5T3Q and S2S3. Habitat: Wet meadows and along streams.

Geum aleppicum var *strictum* (no common name): Not on any state or federal lists. Ranked by the AKNHP as G5T5 and S2S2. Habitat: Meadows and thickets.

Draba lonchocarpa var *vestita* (no common name): Not on any state or federal lists. Ranked by the AKNHP as G4T3T4 and S2?. Habitat: Alpine, rocky areas.

Thank you for contacting us. If you have further questions call Julia Lenz at 257-2781 or email to anjkm@uaa.alaska.edu.

Sincerely,

Julia Lenz
Research Technician

Alaska Natural Heritage Program's Ranking of Species

AKNHP uses the following protocols in defining the rareness of plant and animal species. Species are ranked on the basis of their global and state rareness (or abundance).

Rare Species Global Rankings

G1: Critically imperiled globally (typically 5 or fewer occurrences).
G2: Imperiled globally (6-20 occurrences).
G3: Rare or uncommon globally (21-100 occurrences).
G4: Widespread, abundant, and apparently secure globally, but with cause for long-term concern (usually more than 100 occurrences).
G5: Demonstrably widespread, abundant, and secure globally.
G#T#: Global rank of species, and global rank of the described subspecies or variety.
G#G#: Numeric range rank.
G#Q: Taxonomically questionable
G?: Unranked
GU: Unrankable
GH: Historical Occurrence
GX: Extinct
HYB: Hybrid

Rare Species State Rankings

S1: Critically imperiled in state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences).
S2: Imperiled in state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (6-20 occurrences).
S3: Rare or uncommon in the state (21-100 occurrences).
S4: Widespread, abundant, and apparently secure in state, but with cause for long-term concern (usually more than 100 occurences).
S5: Demonstrably widespread, abundant, and apparently secure.
SH: Historical Occurrence
SR: Reported from the state, but not yet verified.
SP: Occurring in nearby state or province; not yet reported in state, but probably will be encountered with further inventory.
S#S#: State rank of species uncertain, best described as a range between the two ranks.
S?: Unranked
SU: Urankable
SA: Accidental
SSYN: Synonym
HYB: Hybrid

Qualifiers:

B = Breeding status
N = Non-breeding status

ALASKA
AGRICULTURAL
STATISTICS
SERVICE

UNITED STATES
DEPARTMENT OF AGRICULTURE
National Agricultural Statistics Service

P.O. Box 799
Palmer, AK 99645
(907)745-4272
FAX (907) 746-4654

December 7, 1998

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 1
To HARRISON GRIFFIN	From D. MUELLER
Co.	Co.
Dept	Phone # 907/745-4272
Fax # 907/267-1434	Fax # 907/746-4654

Dear Harrison,

After examining our lists of farmers for Alaska, we can find only 1 commercial farm that has a Dillingham address This operation has less than 50 acres, no livestock, has some green houses and grows some vegetables This is all the information I am allowed to give out. We would have no information on home gardens, pleasure animals, or other non-commercial agriculture activities.

If you have any other questions about Agriculture in the area, please feel free to call me at 907-745-4272.

Sincerely,

D M Mueller

David M.. Mueller
Agricultural Statistician for Alaska

TONY KNOWLES,
GOVERNOR

Street address:
576 Kenny Wren Rd.
DILLINGHAM, AK

Mailing address:
P. O. Box 230
DILLINGHAM, AK 99576-0230

PHONE: (907) 842-2427
FAX: (907) 842-5937

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

December 9, 1998

Mr. Harrison Griffin
BLM
Anchorage, AK

907-267-1451
Fax 907-267-1434

Dear Mr. Harrison,

The following is my attempt to answer your information request regarding the waters and fisheries near the site of the Red Top mercury mine waste clean-up, Aleknagik Alaska.

First I want to be clear that as the area sport fishery biologist, I can only provide you with information on the sport fishery. I have shared your request with Jim Browning, Area Biologist for the commercial fisheries, and some subsistence data near the site. Note that this area is a very important to subsistence and commercial fishing. When I talked to you I had forgotten that in 97 and 98 much commercial fishing occurred well within the area of concern.

16) What is the average human food chain production (pounds per year per acre) for each surface water body within 15 miles downstream (rivers, streams, etc.) or 15 mile radius (lakes, bays, etc.)?

I assume "human food chain production" to mean pounds of food for humans. As we discussed, and you have observed, the tide cycles near the site cause the Wood River to flow upstream on occasion; therefore I will address the second criterion of "within a 15 mile radius" of the site. Therefore major water bodies providing fish for human use include the nearly the entire Wood River, approx. lower 12 miles of Lake Aleknagik, lower sections of the Muklung River and lower Silver Salmon Creek. There are a number of smaller tributaries entering these waters within the 15 mile radius but to quantify the amount of fish taken from them for human use may be nearly impossible. My estimates are based the recent 1993-1997average annual sport fishery harvest as reported in the ADFG Division of Sport Fish statewide harvest and participation mail survey (see citations following this letter).

I will leave it to you to do the geography / cartography and math to work out the "per acre" part and simply provide you with my best guess of number of fish and approximate poundage.

Sport fishery harvest only:

Species	Basis	Number of fish	Average weight (lbs)		Estimated total weight annually
Chinook	50% of Wood R. L.	66	20lb/fish	=	1,320
Coho	67% of Wood R. L.	284	8 lb/fish	=	2,271
Sockeye	67% of Wood R. L.	522	6 lb/fish	=	3,132
Pink Salmon	100% of Wood R. L.	23	4 lb/fish	=	92
Chum Salmon	100% of Wood R. L.	14	8 lb/fish	=	112
Dolly Varden/ Arctic char	33% of Wood R. L.	418	3 lb/fish	=	1,253
Rainbow trout	50% of Wood R. L.	137	3 lb/fish	=	411
Grayling	25% of Wood R. L.	49	1 lb/fish	=	49
White fish	50% of Wood R. L.	6	1 lb/fish	=	6
Pike	50% of Wood R. L.	103	3 lb/fish	=	309
Smelt	100% of Wood R. L.	1,592	0.5 lb/fish	=	796
			Total		**9,751**

17) Identify all sensitive environments...within a 15 mile radius....

Without knowing what your agency's definition of "sensitive environment" is I'm not certai how to answer the question. However, it can be said that the Wood River is an important spawning site for sockeye, chum, pink, possibly coho salmon, and smelt. I expect that some grayling, rainbow trout, char/Dolly Varden, and pike spawn in the 15 mile radius. Slimy sculpins, Alaska blackfish, and stickleback also inhabit these waters. Long nose suckers may inhabit these waters, and in the lower Wood River some brackish or saltwater species like starry flounder may be found occasionally. Much of the lake and river banks within the 15 mile radius are wetlands of varius types and most certainly are important habitat for a wide variety of fish species as well as birds and mammals.

For birds and mammals you should contact our Wildlife Conservation biologist – Jim Woolington. Unfortunately he is on leave until the new year.

Again I will leave the map work to you.

18) This question is map work that you can do.

20) For birds and mammals you should contact our Wildlife Conservation biologist – Jim Woolington. Unfortunately he is on leave until the new year.

24) Location and area (in inches) of all wetlands.

I hope you have some success with our habitat folks in Anchorage but I do not have the time or means to answer this question. And exactly what unit of measure do you want? I find it hard to believe you want to use inches.

I hope you find this material helpful. Call if you have additional questions.

Sincerely,

Dan O. Dunaway
Area Biologist

Literature Cited

Howe, A. L., G. Fidler, and M. J. Mills. 1995. Harvest, catch, and participation in Alaska sport fisheries during 1994. Alaska Department of Fish and Game, Fishery Data Series No. 95-24, Anchorage.

Howe, A. L., G. Fidler, A. E. Bingham, and M. J. Mills. 1996. Harvest, catch, and participation in Alaska sport fisheries during 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-32, Anchorage.

Howe, A. L., G. Fidler, A. E. Bingham, and M. J. Mills. 1997. Harvest, catch, and participation in Alaska sport fisheries during 1996. Alaska Department of Fish and Game, Fishery Data Series. Anchorage.

Howe, A. L., G. Fidler, C. Olnes, A. E. Bingham, and M. J. Mills. 1998. Harvest, catch, and participation in Alaska sport fisheries during 1997. Alaska Department of Fish and Game, Fishery Data Series No. 98-25, Anchorage.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DILLINGHAM OFFICE

TONY KNOWLES, GOVERNOR

COMMERCIAL FISHERIES
PHONE: (907) 842-5227

SPORT FISH
PHONE: (907) 842-2427

P.O. BOX 230
DILLINGHAM, AK 99576

FAX: (907) 842-5937

RAPIFAX TRANSMITTAL SHEET

TO: Harrison Griffin
BLM

DATE: 12-10-98

PAGES: 5
(following this page)

FROM: ADF&G Dillingham
Browning & Dunaway

SUBJECT: Red Top Mine data

Following is our response for Commercial + Sport Fish Divisions.
Our Wildlife Biologist is on leave until 1/2/99.
Our Subsistence specialist will try to have some data to you tomorrow.
Be assured — the area in question is very important for subsistence fish + game.
Molly Chythlook is the subsistence staff.
842-5925

TONY KNOWLES, GOVERNOR

DEPARTMENT OF FISH AND GAME

Division of Commercial Fisheries

P.O. Box 230
546 Kenny Wren Road
Dillingham, Alaska 99576-0230
PHONE: (907) 842-5227
FAX: (907) 842-5937

MEMORANDUM

TO: Harrison Griffin
Bureau of Land Management
Anchorage

DATE: December 9, 1998

PHONE: 842-5227

FAX: 842-5937

FROM: James Browning
Area Management Biologist
Division of Commercial Fisheries
Dillingham

SUBJECT: Information Request

Mr. Griffin:

First, I would like to point out that the Wood River is extremely productive and such an important producer of sockeye salmon in the Nushagak District that any analysis of a "quick and dirty" nature is a travesty. Having said that, I will try to give you some information pertinent to your "timely" request.

Item 16: "Average human food chain production". The Wood River drains Wood River Lakes and as such provides the spawning corridor to these nursery lakes for all 5 species of Pacific salmon. We enumerate adult sockeye salmon at a site just above the mine waste site. Over the last 5 years the total run of Sockeye salmon produced by the Wood River Lakes (all of which migrate past the site in question) has averaged 4.0 million fish. We don't enumerate the other species, however, Chinook salmon returning to the Wood River Lakes system would number in the hundreds, Coho salmon would number in the thousands, Chum salmon in the thousands, and Pink salmon in the thousands. A quick calculation for sockeye alone would be: 4.0 million fish X 5.6 lbs./fish = 22.4 million pounds of fish protein production.

Item 17: "Sensitive environments". As mentioned above, it would be difficult to point to any portion of your 4 mile radius or 15 mile distance upstream or downstream that wasn't a "sensitive" environment relative to some biological entity. In addition to the fisheries resources mentioned, the Wood River corridor provides nesting habitat for several species of passerines as well as feeding habitat for shorebirds and other aquatic species. Several species of terrestrial mammals occupy the area including river otter, mink, beaver, wolf, coyote, weasel, fox, brown bear, moose and caribou.

Item 18: "Wetlands". Aside from the Wood River, there are numerous shallow lakes and marsh ponds within a 15 mile radius. A topo map and planimeter would yield an accurate figure.

Item 20: "terrestrial sensitive environments". See 17 above.

Item 24: "Location and area of wetlands". See 18 above.

Again, Mr. Griffin, the Wood River and the basin that it drains is one of the most productive river systems in the world and should be treated and documented as such.

Appendix 2

Environmental Protection Agency
Request Letter and Tables

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

July 6, 1998

RECEIVED
JUL 13 1998
BUREAU OF LAND MANAGEMENT

Nick Douglas
Bureau of Land Management
222 West 7th Avenue, #13
Anchorage, Alaska 99513-7599

Dear Mr. Douglas:

The U.S. Environmental Protection Agency (EPA) has reviewed the recently submitted information concerning the removal action at the Red Top Retort site. EPA finds the information submitted to be deficient to calculate a Hazard Ranking System score as required for sites listed on the Federal Agency Hazardous Waste Compliance Docket. The Red Top Retort site was placed on the Docket on June 27, 1997. The following represents EPA's comments and information request concerning the reviewed information:

- HRS target information is absent from the data reviewed for the site. Please provide information requested in attachment A as it pertains to the surface water pathway.

- Samples of soil and sediment should be collected from the source areas and the Wood river. Samples should be analyzed for full Target Analyte List (TAL) (inorganic).

- Samples from each bin located on site should be analyzed for the full TAL.

- Collect four sediment samples from Wood Creek; one upgradient, one at the probable point of entry and two down gradient on 500 foot centers, from the site.
  NOTE: Make sure that the upgradient sample is outside of any potential influence of the site (i.e., flooding or tidal, etc.).

- Collect one background soil sample.

- All samples should be analyzed for the complete TAL.

If you have any questions concerning these comments, please call me at 206-553-1808.

Mark Ader

Site Assessment Manager

Printed on Recycled Paper

PRELIMINARY ASSESSMENT (PA)
DATA REQUIREMENTS
FOR FEDERAL FACILITY DOCKET SITES

1. Supply copies of all existing sampling data, on-site and off-site, including location map, detection limits (see definitions, pg.5), raw data sheets, QA/QC documents, date(s) sampled, analytical method(s) used, well or boring logs, and sampling technique(s).

2. Locate and identify on a topo map all known or suspected sources (see definitions, pg. 5). Supply all information about source(s) such as; dates of operation, use, and spillage; amounts of material deposited, stored, or spilled; dimensions of source(s); known or suspected hazardous substances (see definitions, pg. 5), etc.

3. Provide a description of all aquifers beneath the site. Include description of overlying materials (i.e., hydraulic conductivity/permeability), thickness, composition, and depth aquifer is first encountered. *NOTE: This data requirement involves a literature search of all current or existing geologic information.

4. For each source, choose one description from Table 1 (page 6-7) that describes the ground water containment. Provide complete documentation (i.e., engineering diagrams, photographs {originals}) as to why the source meets that description and not any other in the table.

5. Provide the location of all drinking water wells (by HRSII distance rings in table format) in all aquifers within 4-mile radius from site (property boundary). Show on topo map all wells within 1-mile radius. Provide information on depth of well(s), screening interval(s), depth aquifer(s) encountered, and population served. For multiple wells (i.e., municipal system) provide the number of wells, location of all wells (regardless of 4-mile limit), average annual pumpage of each well (regardless of 4-mile limit), and total population served by system. Include information on all standby wells.

6. Provide information and location of wells within 4-miles (on topo map show all wells within 1-mile radius) that are used:

a) to irrigate 5 or more acres of commercial food or forage crops,
b) for watering of commercial livestock,
c) as an ingredient in commercial food preparation,
d) as a supply to aquaculture, or
e) as a supply for a major or designated water recreation area, excluding drinking water use.

7. What is the average number of persons per residence (Borough, city, village,

community, etc.) that site is located in?

8. Identify and locate all surface water bodies within 2 miles of site. Indicate the drainage routes (shown on topo map) from each source to applicable surface water bodies. Provide the average annual flow (cubic feet per second) for each surface water body within 15 miles downstream (river, stream, etc.) or 15-mile radius (lakes, bays, etc.) from the point of probable entry into surface water. For lakes, provide information on inflow and outflow.

9. For each source, choose one description from Table 2 (page 7-8) that best describes the surface water containment. Provide complete documentation (i.e., engineering diagrams, photographs {originals}) as to why the source meets that description and not any other in the table.

10. What is the number of acres in each drainage basin?

11. From Table 3 (page 8), choose the predominant soil group (surface soil) which comprises the largest total area within each drainage area.

12. What is the 2-year, 24-hour rainfall? What is the Annual Net Precipitation?

13. From Table 4 (page 8), choose the floodplain category for each source (supply Federal Emergency Management Agency or U.S. Army Corps of Engineers floodplain map) and determine if each source meets the criteria from Table 5 (page 9) (engineer's certification).

14. Provide the location (by HRSII distance rings in table format) of all drinking water intakes within 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.). Show on topo map all intakes within 1-mile radius/downstream. Provide information on population served. For multiple intakes (i.e., municipal system) provide information on the number of intakes, location of all intakes (regardless of 15-mile limit), average annual pumpage of each intake (regardless of 15-mile limit), and total population served by system. Include information on all standby intakes.

15. Provide information and location of intakes within 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.) that are used:*

a) to irrigate 5 or more acres of commercial food or forage crops,
b) for watering of commercial livestock,
c) as an ingredient in commercial food preparation,
d) as a supply for aquaculture, or
e) as a supply for a major or designated water recreation area, excluding drinking water use.

*On topo map show location of intakes within 1-mile radius/downstream.

16. What is the average human food chain production (pounds per year per acre) for each surface water body within 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.)?

17. Identify all sensitive environments (Table 6, page 9) that exist within a 4-mile radius on land, 15 miles downstream (rivers, streams, etc.), or 15-mile radius (lakes, bays, etc.), in HRSII distance ring table format. Provide original documentation (U.S. Fish & Wildlife, Natural Heritage Database, State agencies, National Oceanic and Atmospheric Administration, etc.) and locate each environment within 1-mile on a topo map. Note that there could be multiple sensitive environments within the appropriate limit.

18. What is the linear frontage (miles) of all wetlands 15 miles downstream (rivers, streams, etc.) or 15-mile radius (lakes, bays, etc.)? *All sides of waterbody.

19. What is the location and number of persons residing, working, attending school or day care within 200 feet of each source?

20. Identify all terrestrial sensitive environments (Table 7, page 10) that exist on-site. Provide original documentation (U.S. Fish & Wildlife, Natural Heritage Database, State agencies, National Oceanic and Atmospheric Administration, etc.) and locate each on a topo map. Note that there may be multiple sensitive environments within the site limits/boundaries.

21. For each source, choose one description from Table 8 (page 10) that describes the accessibility of the site. Provide complete documentation (i.e., engineering diagrams, photographs {originals}) as to why the source meets that description and not any other in the table.

22. What is the total number of people within the following distance categories?:
    0 - 1/4 mile
    1/4 - 1/2 mile
    1/2 - 1 mile
    1 - 2 miles
    2 - 3 miles
    3 - 4 miles

Use current/available Census data and/or actual house counts. Document how calculated.

23. For each source, choose one description from Table 9 (page 10) that describes the gaseous containment. From Table 10 (page 11), choose the appropriate description of each source type. For each source, choose one description from Table 11 (page 11) that describes the particulate containment. Provide complete documentation (i.e., engineering diagrams, photographs {originals}) as to why the source meets that description and not any other in the table.

24. What is the location and area (in acres) of all wetlands within 4 miles of site?

25. Contact EPA Regional Office immediately if any radionuclides are present or suspected at site and supply all radiological information known to date.26. Have any removals or remedial actions taken place at site? If yes, then submit ALL information pertaining to action taken.

26. For all of the above information, use primary data sources and supply 2 copies or specify where copies may be obtained.

27. Has any of the above information been previously submitted to the EPA Superfund Program? If yes, please specify the reference (page and paragraph) or provide a copy of the document.

DEFINITIONS

Detection Limit (DL): Lowest amount that can be distinguished from the normal random "noise" of an analytical instrument or method. For this submission, the detection limit used is the method detection limit (MDL), or for real-time instruments, the detection limit of the instrument as used in the field.

Hazardous Substance: CERCLA hazardous substances, pollutants, and contaminant as defined in CERCLA sections 101(14) and 101(33).

Method Detection Limit (MDL): Lowest concentration of an analyte that a method can detect reliably in either a sample or blank.

Primary Sources: Primary sources include geological publications, field observations/measurements, analytical results, and waste manifests. Primary references are the original materials in which the information was given.

Sample Quantitation Limit (SQL): Quantity of a substance that can reasonably be quantified given the methods of analysis and sample characteristics that may affect quantification (for example, dilution/concentration).

Secondary References: Materials that refer to the original source of information. Such references may include, for example: (1) allegations of buried drums; (2) estimates of the depth of landfills or lagoons; and (3) summaries of analytical results without actual laboratory data. Note that PA and SI reports may contain a large amount of secondary information (e.g., collected from file materials and published reports). Therefore, the actual documents referenced in these reports should be used as the primary references.

Site: Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include areas between sources.

Source: Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance. Sources do not include those volumes of air, ground water, surface water, or surface water sediments that have become contaminated by migration, except: in the case of either a ground water plume with no identified source or contaminated surface water sediments with no identified source, the plume may be considered a source.

Table 1

All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)

Evidence of hazardous substance migration from source area (i.e. source area includes source and any associated containment structures).
No liner
No evidence of hazardous substance migration from source area, a liner, *and:*

(a) None of the following present (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system. or (3) functioning leachate collection and removal system immediately above liner.
(b) Any one of the three items in (a) present
(c) Any two of the items in (a) present
(d) All three items in (a) present plus a functioning ground water monitoring system
(e) All items in (d) present plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.

No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, functioning ground water monitoring system, and:
(f) Only one of the following deficiencies present in containment (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained runon control system and runoff management system, or (3) no or nonmaintained engineered cover.
(g) None of the deficiencies in (f) present
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present

Surface Impoundment

Evidence of hazardous substance migration from surface impoundment
No liner
Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained
No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, *and:*

(a) Liner
(b) Liner with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.
(c) Double liner with functioning leachate collection and removal system between liners, and functioning ground water monitoring system.

No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

Land Treatment

Evidence of hazardous substance migration from land treatment zone
No functioning, maintained, run-on control and runoff management system
No evidence of hazardous substance migration from land treatment zone *and:*

(a) Functioning and maintained run-on control and runoff management system
(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.
(c) Land treatment area maintained in compliance with 40 CFR 264.280

Containers

All containers buried
Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).
No liner (or no essentially impervious base) under container area
No diking (or no similar structure) surrounding container area
Diking surrounding container area unsound or not regularly inspected and maintained
No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspect ed and maintained, and:

(a) Liner (or essentially impervious base) under container area
(b) Essentially impervious base under container area with liquids collection and removal system
(c) Containment system includes essentially impervious base, liquids collection system, sufficient contain 10 percent of volume of all containers, and functioning and maintained run-on control; plus functioning ground water monitoring system, and spilled or leaked hazardous substances and accumulated precipitation removed in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.
(d) Free liquids present containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, single liner under container area with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.
(e) Same as (d) except: double liner under container area with functioning leachate collection and removal system between liners.

Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing free liquids not deposited in any container, and functioning and maintained run-off control present
No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquid or solidification of remaining wastes and waste residues).

Tank

Below-ground tank
Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).
Tank and ancillary equipment not provided with secondary containment, (e.g., liner under tank area, vault system, double wall).
No diking (or no similar structure) surrounding tank and ancillary equipment
Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained.
No evidence of hazardous substance migration from tank area. tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, and:

(a) Tank and ancillary equipment provided with secondary containment
(b) Tank and ancillary equipment provided with secondary containment with leak detection and collection system.
(c) Tank and ancillary equipment provided with secondary containment system that detects and collects spilled or leaked hazardous substances and accumulated precipitation and has sufficient,capacity to contain 110 percent of volume of largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in timely manner, at least weekly inspection of tank and secondary containment system, all leaking or unfit-for-use tank systems promptly responded to, and functioning ground water monitoring system.
(d) Containment system has sufficient capacity to hold volume of all tanks within tank containment area and to provide adequate freeboard, single liner under that containment area with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.
(e) Same as (d) except double liner under tank containment area with functioning leachate collection and removal system between liners.

Tank is above ground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.

Table 2

All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks).

Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures)
No evidence of hazardous substance migration from source areas and:

(a) Neither of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system.
(b) Any one of the two items in (a) present
(c) Any two of the following present. (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) liner with functioning leachate collection and removal system immediately above liner.
(d) All items in (c) present
(e) All items in (c) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area

No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, and:

(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained runon control system and runoff management system. or (3) no or nonmaintained engineered cover.
(g) None of the deficiencies in (f) present

Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present

Surface Impoundment

Evidence of hazardous substance migration from surface impoundment
Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained
No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, *and:*

(a) No liner
(b) Liner
(c) Liner with functioning leachate collection and removal system below liner
(d) Double liner with functioning leachate collection and removal system between liners

No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

Land Treatment

Evidence of hazardous substance migration from land treatment zone
No functioning and maintained run-on control and runoff management system
No evidence of hazardous substance migration from land treatment zone *and:*

(a) Functioning and maintained run-on control and runoff management system
(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.
(c) Land treatment area maintained in compliance with 40 CFR 264.280

Containers

All containers buried
Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).
No diking (or no similar structure) surrounding container area
Diking surrounding container area unsound or not regularly inspected and maintained
No evidence of hazardous substance migration from container area and container area surrounded by sound diking that is regularly inspected and maintained.
No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspected and maintained, and:

(a) Essentially impervious base under container area with liquids collection and removal system;
(b) Containment system includes essentially impervious base, liquids collection system, sufficient capacity to contain 10 percent of volume of all containers, and functioning and maintained run-on control; and spilled or leaked hazardous substances and accumulated precipitation removed in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.
(c) Free liquids present containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, and single liner under container area with functioning leachate collection and removal system below finer.
(d) Same as (c) except: double liner under container area with functioning leachate collection and removal system between liners Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing tree liquids not deposited in any container, and functioning and maintained run-on control present.

No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

Tank

Below-ground tank
Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).
No diking (or no similar structure) surrounding tank and ancillary equipment
Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained
No evidence of hazardous substance migration from tank area and tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained.
No evidence of hazardous substance migration from tank area, tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, and:

(a) Tank and ancillary equipment provided with secondary containment (e.g., liner under tank area, vault system, double-wall) with leak detection and collection system.
(b) Tank and ancillary equipment provided with secondary containment system that detects and collects spilled or leaked hazardous substances and accumulated precipitation and has sufficient capacity to contain 110 percent of volume of largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in a timely manner, at least weekly inspection of tank and secondary containment system, and all leaking or unfit-for-use tank systems promptly responded to.
(c) Containment system has sufficient capacity to hold total volume of all tanks within the tank containment area and to provide adequate freeboard, and single liner under tank containment area with functioning leachate collection and removal system below liner.
(d) Same as (c) except double liner under tank containment area with functioning leachate collection and removal system between liners.

Tank is above ground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.

Table 3

Surface Soil Description

Course-textured soils with high infiltration rates (for example, sands, loamy sands)
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams)
Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams)
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement)

Table 4

Floodplain Categories

Source floods annually
Source in 10-year floodplain
Source in 100-year floodplain
Source in 500-year floodplain
None of the above

Table 5

Flood Containment

Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated (see floodplain category)

Table 6

Sensitive Environments

Critical habitat[a] for Federal designated endangered or threatened species
Marine Sanctuary
National Park
Designated Federal Wilderness Area
Areas identified under Coastal Zone Management Act[b]
Sensitive areas identified under National Estuary Program[c] or Near Coastal Waters Program[d]
Critical areas identified under the Clean Lakes Program[e]
National Monument[f]
National Seashore Recreational Area
National Lakeshore Recreational Area
Habitat known to be used by Federal designated or proposed endangered or threatened species
National Preserve
National or State Wildlife Refuge
Unit of Coastal Barrier Resources System
Coastal Barrier (undeveloped)
Federal land designated for protection of natural ecosystems
Administratively Proposed Federal Wilderness Area
Spawning areas critical[g] for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters
Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time
Terrestrial areas utilized for breeding by large or dense aggregations of animals[h]
National river reach designated as Recreational
Habitat known to be used by State designated endangered or threatened species
Habitat known to be used by species under review as to its Federal endangered or threatened status
Coastal Barrier (partially developed)
Federal designated Scenic or Wild River
State land designated for wildlife or game management
State designated Scenic or Wild River
State designated Natural Areas
Particular areas, relatively small in size, important to maintenance of unique biotic communities
State designated areas for projection or maintenance of aquatic life[i]

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a Critical habitat as defined in 50 CFR 424.02.
b Areas identified in State Coastal Zone Management plans as requiring protection because of ecological value
c National Estuary Program study areas (Subareas within subareas) identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species (Section 320 of Clean Water Act, as amended).
d Near Coastal Waters as defined in Sections 104(b)(3), 304(1), 319, and 320 of Clean Water Act, as amended.
e Clean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State Clean Lake Plans as critical habitat (Section 314 of Clean Water Act, as amended).
f Use only for air migration pathway.
g Limit to areas described as being used for intense or concentrated spawning by a given species.
h For the air migration pathway, limit to terrestrial vertebrate species. For the surface water migration pathway, limit to terrestrial vertebrate species with aquatic or semiaquatic foraging habits.
i Areas designated under Section 305(a) of Clean Water Act, as amended.

Table 7

Terrestrial sensitive environments

Terrestrial critical habitat[a] for Federal designated endangered or threatened species
National Park
Designated Federal Wilderness Area
National Monument
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species
National Preserve (terrestrial)
National or State Terrestrial Wildlife Refuge
Federal land designated for protection of natural ecosystems
Administratively proposed Federal Wilderness Area
Terrestrial areas utilized for breeding by large or dense aggregations of animals[b]
Terrestrial habitat known to be used by State designated endangered or threatened species
Terrestrial habitat known to be used by species under review as to its Federal designated endangered or threatened status
State lands designated for wildlife or game management
State designated Natural Areas
Particular areas, relatively small in size, important to maintenance of unique biotic communities

---

a Critical habitat as defined in 50 CFR 42
b Limit to vertebrate species.

Table 8

Area of observed contamination

Designated recreational area
Regularly used for public recreation (for example, fishing, hiking, softball)
Accessible and unique recreational area (for example, vacant lots in urban area)
Moderately accessible (may have some access improvements-for example, gravel road), with some public recreation use
Slightly accessible (for example, extremely rural area with no road improvement), with some public recreation use
Accessible, with no public recreation use
Surrounded by maintained fence or combination of maintained fence and natural barriers
Physically inaccessible to public, with no evidence of public recreation use

Table 9

Gas containment description

All situations except those specifically listed below
Evidence of biogas release
Active fire within source
Gas collection/treatment system functioning, regularly inspected, maintained, and completely covering source
Source substantially surrounded by engineering windbreak and no other containment specifically described in this table applies
Source covered with essentially impermeable, regularly inspected, maintained cover
Uncontaminated soil cover >3 feet:
- Source substantially vegetated with little exposed soil
- Source lightly vegetated with much exposed soil
- Source substantially devoid of vegetation

Uncontaminated soil cover ≥ 1 foot and ≤ 3 feet:
- Source heavily vegetated with essentially no exposed soil
- Cover soil resistant to gas migration[a]
- Cover soil type not resistant to gas migration[a] or unknown
- Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration[a]
- Other

Uncontaminated soil cover <1 foot:
- Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration[a]
- Other

Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies
Source consists solely of intact, sealed containers:
- Totally protected from weather by regularly inspected, maintained cover
- Other

Table 10

Source type

Active fire area
Burn pit
Containers or tanks (buried/belowground):
- o Evidence of biogas release
- o No evidence of biogas release

Containers or tanks, not elsewhere specified
Contaminated soil (excluding land treatment)
Landfarm/land treatment
Landfill:
- o Evidence of biogas release
- o No evidence of biogas release

Pile:
- o Tailings pile
- o Scrap metal or junk pile
- o Trash pile
- o Chemical waste pile
- o Other waste piles

Surface impoundments (buried/ backfilled):
- o Evidence of biogas release
- o No evidence of biogas release

Surface impoundment (not buried/backfilled):
- o Dry
- o Other

Other types of sources, not elsewhere specified

Table 11

Particulate containment description

All situations except those specifically listed below
Source contains only particulate hazardous substances totally covered by liquids
Source substantially surrounded by engineered windbreak and no other containment specifically described in this table applies
Source covered with essentially impermeable, regularly inspected, maintained cover
Uncontaminated soil cover > 3 feet:
- Source substantially vegetated with little or no exposed soil
- Source lightly vegetated with much exposed soil
- Source substantially devoid of vegetation

Uncontaminated soil cover ≥ 1 foot and ≤ 3 feet:
- Source heavily vegetated with essentially no exposed soil:
  - -Cover soil type resistant to gas migration[a]
  - -Cover soil type not resistant to gas migration[a] or unknown
- Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration[a]
- Other

Uncontaminated soil cover < 1 foot:
- Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration[a]
- Other

Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies
Source consists solely of containers:
- All containers contain only liquids
- All containers intact, seated, and totally protected from weather by regularly inspected, maintained cover
- All containers intact and sealed
- Other

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a Consider moist fine-grained and saturated coarse-grained soils resistant to gas migration, consider all other soils nonresistant.