Aurora Energy Coal Power Plant
Preliminary Assessment
Fairbanks, AK

TDD: 11-06-0004

January 2012

Prepared for:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
1200 Sixth Avenue
Seattle, Washington 98101

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.
720 Third Avenue, Suite 1700
Seattle, Washington 98104

This page intentionally left blank.

Table of Contents

Table of Contents (cont.)

List of Tables

Table

This page intentionally left blank.

List of Figures

Figures

This page intentionally left blank.

List of Abbreviations and Acronyms

ADEC	Alaska Department of Environmental Conservation
BMP	Best Management Practices
cfs	cubic feet per second
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
facility	Aurora Energy Coal Power Plant
NPDES	National Pollutant Discharge Elimination System
mg/kg	milligrams per kilogram
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
PPE	Probable Point of Entry
START	Superfund Technical Assessment and Response Team
TCLP	Toxicity Characteristic Leaching Procedure
TDL	Target Distance Limit
UST	Underground storage tank

This page intentionally left blank.

1 Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of a Preliminary Assessment (PA) at the Aurora Energy Coal Power Plant site in Fairbanks, Alaska. E & E completed PA activities under Technical Direction Document Number 11-06-0004, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3 Contract No. EP-S7-06-02.

The specific goals for the Aurora Energy Coal Power Plant PA, as identified by the EPA, are to:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the site on the National Priorities List.

Completion of the PA included reviewing existing site information, collecting receptor information within the range of site influence, determining regional characteristics, and conducting a site visit. This document includes a discussion of background site information (Section 2), a discussion of migration/exposure pathways and potential receptors (targets; Section 3), a summary of site information (Section 4), and a list of pertinent references (Section 5).

This page intentionally left blank.

2.4 Operations and Waste Characteristics

The Aurora Energy Coal Power Plant and District Heat System is located in the core area of the city of Fairbanks. The facility produces steam and hot water for approximately 165 district heat customers. It is capable of providing 25 megawatts of wholesale electrical power generation to the local electric cooperative, Golden Valley Electric Association. The facility operates four boilers and three turbine generators. A full-stream baghouse was installed during 2006. The facility burns approximately 210,000 tons of coal per year (Usibelli 2011).

Coal handling facilities are located on the north bank of the Chena River, consisting of an enclosed coal crusher, open storage piles, and conveyors. Coal is transported by conveyors over the Chena River to the facility, located on the south bank of the river (Figure 2-2).

Coal ash from the combustion chamber of each boiler is drawn to hoppers by use of a vacuum system. The coal ash from each boiler is collected in hoppers and then drawn through a baghouse, where ash is separated from the air. Ash is subsequently wetted in a pugmill to reduce fugitive dust before being loaded into trucks at the loading area. Trucks are covered with a tarp. The ash silo and ash loadout equipment are located at the east side of the facility. Coal ash has been used as fill throughout Fairbanks (see Section 2.4.1).

A full stream baghouse was installed in 2006. Prior to this installation, there was a partial stream baghouse and dust collectors on each of the boilers (Usibelli 2011). Installation dates of the dust collectors are unknown.

The facility has a National Pollutant Discharge Elimination System (NPDES) discharge permit (Permit No. AK-005333-3) for the discharge of non-contact cooling water into the Chena River. Water is pulled in from the river at an intake at the northeastern corner of the site and discharged at the northwestern corner of the site (Figure 2-2). The discharge is monitored for temperature (ADEC 2002).

A news release dated December 8, 2005, indicated that the EPA reached a settlement with Aurora Energy of Fairbanks, Alaska, for violations of the Federal Clean Water Act at its Aurora Energy Power Plant. During inspections, the EPA noted the presence of coal dust on the south banks of the Chena River (EPA 2005). Coal dust in water can reduce oxygen levels, which can have a major negative effect on fish and wildlife in the river (EPA 2005).

To address discharges of coal dust such as those seen during the inspections, Aurora Energy's NPDES permit requires Aurora Energy to include measures in its Best Management Practices (BMP) Plan to prevent or minimize coal and/or coal dust from falling from the coal conveyor line into the Chena River (EPA 2005).

Aurora Energy's draft BMP Plan, submitted to the EPA prior to the inspections, was found to be incomplete and did not meet the permit requirements. The BMP

2 Site Background

2.1 Site Location

Site Name:	Aurora Energy Coal Power Plant
CERCLIS ID Number:	AKN001002940
Site Address:	1206 1st Avenue Fairbanks, AK 99701
Latitude:	64° 50' 48.753"North
Longitude:	147° 43' 59.9586"West
Legal Description:	Section 10, Township 1 South, Range 1 West
County:	North Star Borough
Congressional District:	At large
Site Owner(s):	Aurora Energy LLC 1206 1st Avenue Fairbanks, AK 99701 (907) 452-7107
Site Operator(s):	Steve Ferree, Mark Brazeau
Site Contact(s):	Steve Ferree

2.2 Site Description

Aurora Energy, LLC owns and operates the Aurora Energy Coal Power Plant (facility), a coal-fired facility that generates electricity, steam heat, and hot water for Fairbanks customers. The facility is located in downtown Fairbanks on the south bank of the Chena River (Figure 2-1). The site is an irregularly shaped lot and includes a coal-handling facility on the north bank of the Chena River (Figure 2-2).

The facility includes the power plant, a maintenance warehouse, a baghouse, and a conveyor belt used to transfer coal from the coal handling facility to the power plant. The facility is adjacent to the Golden Heart Utility Water Treatment Plant, which supplies drinking water to Fairbanks residents.

First Avenue borders the site to the south. Storm drains on First Avenue convey stormwater runoff directly to the Chena River (Fairbanks North Star Borough 2011).

2.3 Ownership History

The facility began operating in 1954 and was owned and operated by the Fairbanks Municipal Utility System from 1954 through 1998. The facility was purchased in 1998 by Aurora Energy, LLC, a subsidiary of the Usibelli Corporation.

Plan did not identify any measures to prevent or minimize coal and/or coal dust from falling from the coal conveyor line. Since Aurora Energy did not adequately prepare a BMP Plan, the company failed to comply with the terms of its NPDES permit in violation of Section 309(g)(2)(B) of the Federal Clean Water Act. The EPA and Aurora Energy agreed to settle these violations with a fine of $33,000 (EPA 2005). The facility has since installed BMPs to reduce coal dust falling from the coal conveyor line; these practices were in place at the time of the START site visit (see section 2.6).

The facility has an Air Quality Operating Permit (Permit No. AQ0315TVP02), issued in 2006. The Alaska Department of Environmental Conservation (ADEC) has indicated the facility has committed opacity violations during soot-blows between 2001 and 2004 (ADEC 2006).

2.4.1 Potential Sources

Potential sources at the site include coal ash and coal dust.

Coal ash: The facility generates approximately 50,000 tons of coal ash per year. The coal ash is removed from site by a contractor and is subsequently used for structural fill throughout the city of Fairbanks. Coal ash from the plant is used throughout the Fairbanks area and is stored in large piles for use as road substrate or construction fill for both commercial and residential developments.

Prior to the installation of a full stream baghouse in 2006, the facility had committed opacity violations of its air quality permit (ADEC 2006). Prior to the installation of dust collectors (installation date unknown), it may be presumed that coal ash was released into the atmosphere.

On May 16, 2011, a citizen filed a petition with the EPA regarding coal ash from the facility. The citizen was concerned that coal ash particles were impacting air quality in the area. The citizen had observed coal ash particles tracked from the plant onto First Avenue, as well as black dust particles on windowsills of a nearby residence (EPA 2011).

Aurora Energy has a number of BMPs in place to minimize release of coal ash to the air and surrounding area. A baghouse collects 100% of the ash from the plant processes. At the ash truck filling station, a pugmill is used to wet the ash before it is loaded into the truck within a covered loading area. The truck bed is then covered with a tarp. The truck operator hoses off the truck at a truck wash area (during summer months using water, during winter months using air) to remove coal ash from the vehicle tires. Berms along the northern edge of the power plant site prevent stormwater runoff from entering the Chena River.

Coal dust: Coal is conveyed across the Chena River from the coal handling facility to the power plant. The conveyor belt is not completely enclosed and has bins along it to catch coal dust. At the time of the site visit, coal dust was observed on

both the north and south banks of the Chena River. Coal used at the plant is Healy Coal, mined from the Usibelli Coal Mine, Inc., in Healy, Alaska.

2.5 Previous Investigations

2.5.1 Phase II Site Investigation, May 1996

A Phase II Site Investigation was conducted in May 1996 by Woodward Clyde for Pacific Telecom, Inc., in Vancouver, Washington, as Pacific Telecom was considering purchasing the facility. This investigation was conducted for the water treatment plant facility and the power plant facility, which were both owned by the Fairbanks Municipal Utility System at the time of the investigation.

At the time of the investigation, there were two 10,000-gallon aboveground diesel storage tanks used to fuel the emergency generator. There were two 1,500-gallon underground oil/water separator tanks that collected effluent from floor drains in the power plant and discharged it into the Chena River.

Subsurface soil samples were collected from six boreholes locations, from depths ranging from 2.5 to 16 feet below ground surface (bgs). One groundwater sample was collected from an existing on-site monitoring well. Soil and ground water samples were analyzed for gasoline range organics, diesel range organics, polychlorinated biphenyls (PCBs), and halogenated volatile organic compounds. Soil samples were also analyzed for total petroleum hydrocarbons.

Subsurface soil samples were collected from boreholes near the maintenance warehouse drain, former oil-water separator tanks, the location of a former 500-gallon diesel underground storage tank (UST), and the location of two former 2,000-gallon gasoline USTs (Woodward Clyde 1996). Soils sample locations are shown in Figure 2-3. ADEC UST records confirm that one 500-gallon diesel UST and two 2,000-gallon gasoline USTs had been removed from the site; however, disposal records were unavailable. At time of removal, ADEC had determined that the site required No Further Action in relation to these tank removals (ADEC 1998).

During Phase II, petroleum contaminated soil was identified near the former 2,000-gallon gasoline USTs. Diesel range organics were detected at 2,500 milligrams per kilogram (mg/kg) which is above the ADEC clean-up level of 100 mg/kg. Additionally, gasoline range organics were detected at 87 mg/kg, which is above the ADEC clean-up level of 50 mg/kg. The source of diesel contamination in this area is not clear. Low levels of PCBs were detected near the maintenance warehouse drain and the former oil-water separators. PCB concentrations were not above ADEC clean-up levels.

Ground water was sampled from one monitoring well on site, located near the eastern edge of the power plant. No analytes were found above detection limits in the ground water sample (Woodward Clyde 1996).

2.5.2 Coal Ash in Fairbanks Area 2010

In June 2010, a sampling project was conducted by Alaska Community Action on Toxics in the Fairbanks area in an effort to determine the composition of coal ash and whether it may be hazardous to community health. Samples were collected from sources of coal ash, including Aurora Energy, and sites with disposed and reused coal ash, such as residential fill piles or road surfacing areas. Sample results indicated that samples of coal ash collected from Aurora Energy contained concentrations of arsenic and vanadium above EPA regional screening levels (ACAT 2010).

2.5.3 Coal Ash Analysis 2011

Aurora Energy has been collecting data on the coal ash since April 2011 and has compared the results to soil samples collected from two locations somewhere in Fairbanks, as well as a wood ash sample (Aurora Energy 2011). The background sample locations are described as "Bently" and "NEC"; however, this source did not provide the specific location of these areas. Samples were submitted for analysis of the following metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and vanadium. Results indicate that concentrations of barium, lead, and mercury in coal ash were significantly higher than concentrations in background soil samples. Analytical results of soil samples and coal ash samples are presented in Table 2-1.

Since the locations of the background samples is not known, nor whether these locations may have been under the influence of historic aerial deposition of coal ash or from use of ash as fill material, it is helpful to review other sources of information regarding background concentrations. A 1988 United States Geological Survey publication provides the expected range of background soil metals concentrations in Alaska (USGS 1988). Based on these data, 95 percent of background locations are expected to fall within the following ranges: arsenic 2.08 to 11.32 mg/kg, barium 591.66 to 598.34 mg/kg, chromium 46 to 54 mg/kg, lead 8.52 to 15.48 mg/kg, and vanadium 108.62 to 115.38 mg/kg. This publication does not provide background information for cadmium, selenium, or silver. This publication also documents that background concentrations of arsenic, barium, chromium, and vanadium in Alaska are typically higher than background concentrations of these metals in the conterminous United States (USGS 1988).

Toxicity Characteristic Leaching Procedure (TCLP) analysis of coal ash indicated that none of these analytes exceed TCLP maximum allowable concentrations; the only analyte above the laboratory detection limit was barium (Aurora Energy 2011).

2.6 START Site Visit, September 2011

On September 27, 2011, the START team conducted a site visit of the Aurora Energy Coal Power Plant site in Fairbanks, Alaska. Attendees for the site visit included:

Brandon Perkins, EPA, TM
Ada Hamilton, E & E, Project Manager
Steve Ferree, Aurora Energy
Marc Brazeau, Aurora Energy
Staci Quinlan, Aurora Energy
Tammy Scholten, Aurora Energy

Aurora Energy staff conducted a tour of the facility. The facility is a power plant that has three operating boilers and three turbine generators, used to generate electricity, as well as steam and hot water for residents within the nearby heat district. The site includes a coal handling facility located across the Chena River from the power plant.

There is a water testing lab within the power plant which tests water for hardness, copper, iron, and silica, since impurities in the steam and hot water distribution system can cause buildup in pipes.

Mr. Ferree explained the power plant process, including coal ash removal, which is conducted in such a manner as to minimize coal ash being emitted as fugitive dust or tracked off site on truck tires. Wash water from the truck wash area is pumped to a drain pond located north of the building. This system has been in place since May 2011. Next summer, Aurora Energy intends to install a system that would enable washwater to be recycled and used to wet down the ash as it goes into the truck. During winter months, when sub-freezing temperatures do not allow truck washing, an air hose is used to remove dust from the truck before the truck leaves the site.

There is a maintenance and parts warehouse on site for maintaining plant equipment. No vehicle maintenance takes place on site. There is a storage shed located on site for storing equipment.

The site has an intake building, which takes in water from the Chena River to use as non-contact cooling water. The water is then returned to the Chena River at the northwest corner of the site. The facility has a NPDES permit and monitors the discharge for temperature.

The coal handling facility on the north side of the Chena River includes a building for railcars to unload coal. The coal is then passed through a series of chutes to crush it to the correct size for use at the plant. The crushed coal is transferred to the plant via a conveyor belt across the Chena River. The conveyor belt is equipped with catch bins at each point where it bounces on the rollers to catch some of the coal dust from the conveyor belt. The conveyor is not completely enclosed, and coal fines were observed on both banks of the river.

3 Migration/Exposure Pathways

This section describes the migration/exposure pathways and potential targets within the site's range of influence (Figures 3-1 and 3-2).

3.1 Ground Water Migration Pathway

The target distance limit (TDL) for the ground water migration pathway is a 4-mile radius that extends from the sources at the site. Figure 3-1 depicts the ground water 4-mile TDL.

3.1.1 Geologic Setting

Alluvial deposits cover most of the area of the Chena River and its tributaries, likely deposited by meandering or braided streams that were ancestral to the Chena and Tanana Rivers. The bedrock that underlies and surrounds the alluvial deposits consists primarily of folded, faulted, metamorphic rocks, locally intruded by igneous rocks (Péwé 1976).

3.1.2 Aquifer System

The Tanana Basin Aquifer was identified during the PA to be the main water-yielding deposits beneath the site. The deposits consist of flood-plain alluvium.

Permeable flood-plain alluvium is also present as narrow to wide bands along the Tanana River and its larger tributaries. The alluvial deposits are very thick in some places: wells have penetrated more than 600 feet of alluvium near Fairbanks and about 550 feet near the junction of the Delta and Tanana Rivers. Where the alluvium is thick and permeable, it is reported to yield as much as 3,000 gallons per minute to large-capacity wells. Water in these widespread alluvial deposits is mostly unconfined (USGS 1999).

The bedrock consisting of metamorphic rocks, intruded by igneous rocks, is generally dense, compact, and yields little water; locally, however, where it is fractured it will yield significant quantities of water to wells (USGS 1999).

The occurrence and movement of ground water in the Tanana Basin aquifer are directly related to stream levels and stream flow. Most recharge to the aquifer is from seepage through streambeds, rather than from precipitation that falls directly on the aquifer. Water in the alluvial fans moves regionally toward the Tanana River and then downstream, in the same direction of flow as the river (USGS 1999).

Water levels in wells located near streams fluctuate in direct response to rises and falls in stream water levels. Rises in river level are soon followed by rises in ground water levels, indicating that the river and the aquifer are hydraulically

connected. Both stream and aquifer water levels rise in response to precipitation events and snow melt. Ground water in the area flows primarily to the west-northwest (Glass, Lilly, and Mayer 1996).

According to a Phase II Investigation conducted at the site in 1996, ground water at the site flows to the west-northwest. Recharge is principally from infiltration from the Tanana and Chena Rivers. The static water table at the site is approximately 16 feet bgs (Woodward Clyde, 1996).

3.1.3 Drinking Water Targets

Ground water is used to supply domestic and municipal wells within the 4-mile TDL. Drinking water populations by distance ring are provided in Table 3-1.

Domestic drinking water well logs within the TDL are maintained by the Alaska Department of Natural Resources. A search of the Alaska Department of Natural Resources well log tracking system revealed 790 domestic wells within the 4-mile TDL (ADNR 2011). Based the most current census data, the average household size in Fairbanks North Star Borough is 2.68 people (USDOC 2001). Approximately 2,117 people (790 wells x 2.68 people per household) utilize domestic drinking water wells within the TDL.

Golden Heart Utilities maintains the municipal water system for the city of Fairbanks. The water system consists of a total of four wells. One well is located on the Aurora Energy site (Well 3A), and three wells are located on the Golden Heart Utilities Water Treatment Plant property, located adjacent to the site to the west, within 0 to 0.25 miles of the site. The pumping capacity of the wells could not be obtained. For the purposes of this report, it is assumed that no well contributes more than 40 percent of the total pumping capacity. The depth of the water in the wells is from 70 to 90 feet bgs (GHU 2011). The distribution area of Golden Heart Utilities serves an estimated 30,000 people with 6,500 hookups (GHU 2011).

Other municipal water systems within the 4-mile TDL include the College Utility Corporation and the University of Alaska, both located within 2 to 3 miles of the site, and the Fort Wainwright system, located within 3 to 4 miles of the site. The College Utility Corporation system serves approximately 12,600 people. The University of Alaska water system serves approximately 5,000 people. The Fort Wainwright water system serves approximately 12,000 people (EWG 2009).

Ground water is not assumed to be used for irrigation of 5 or more acres for commercial food crops or commercial forage crops, watering of commercial livestock, as an ingredient in commercial food preparation, as a supply for commercial aquaculture, or as a supply for a major or designated water recreation area.

3.2 Surface Water Migration Pathway

The surface water migration pathway TDL begins at the probable point of entry (PPE) of surface water runoff from the site to a surface water body and extends downstream for 15 miles. Figure 3-2 depicts the surface water TDL.

The site is located in the Tanana River flood plain in the Tanana River basin. The Yukon-Tanana uplands border the basin to the north, and the Alaska Range lies to the south (Woodward Clyde 1996). The elevation at the site is approximately 425 feet above sea level. The site topography is generally flat, with steep sloping river banks.

Based on the relatively flat topographic relief and urban setting of the site and vicinity, along with the presence of storm sewers in the adjacent right of ways, the upland drainage area is interpreted to be limited to the site itself.

Soils in the area are floodplain alluvium (Glass, Lilly, and Mayer 1996). Based on soil borings completed at the site, the subsurface consists of 10 feet of sandy gravel fill, which is underlain by fine to medium sand and sandy gravel (Woodward Clyde 1996).

The average annual net precipitation in the area of the site is 10.56 inches, as measured at the Fairbanks Weather Service Office Airport, located approximately 3 miles to the southwest of the site. (WRCC 2011). The 2-year 24-hour rainfall event for Fairbanks, Alaska is 1.25 inches (NOAA 1973). The site is located in an area of a 100-year floodplain, i.e., an area of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile (FEMA 1992). The 2-year 24-hour rainfall event for Fairbanks, Alaska is 1.25 inches (NOAA 1973).

3.2.1 Overland Route

One PPE exists where the conveyor belt traverses the river, resulting in incidental releases of coal ash to the Chena River. Coal from the coal processing facility on the north side of the river is transferred to the power plant via a conveyor belt across the river. During this transfer, some coal dust from the conveyor belt falls into the river.

An additional PPE is present where the municipal stormwater conveyance system on First Avenue discharges stormwater to the Chena River. This stormwater system has the potential to transport coal ash that may be tracked into the street by trucks to its outfall on the Chena River.

There is a berm along the northern edge of the site that prevents stormwater runoff from discharging to the river. There is also a berm along the southern edge of the coal processing facility on the north bank of the river.
From the PPEs, surface water travels 9.5 miles in the Chena River to its confluence with the Tanana River. The 15-mile TDL concludes 4.5 miles downstream in the Tanana River.

Mean annual flow rate for the Chena River at Fairbanks is about 1,400 cubic feet per second (cfs) (Kennedy and Hall 2009), which is classified as a large stream to river. Mean annual flow rate for the Tanana River is 24,570 cfs (USGS 2010), which is classified as a large river.

3.2.2 Drinking Water Targets

No drinking water intakes are located on the Chena or Tanana Rivers within the 15-mile TDL. Although the surface water is likely usable for drinking water purposes, it is not likely to be used as a drinking water source since the rivers in this area of Alaska are generally covered with ice from October to April (National Snow and Ice Data Center 1998). No resources such as commercial agriculture, silviculture, or livestock production occur within the 15-mile TDL. Additionally, no designated recreation area is present within the 15-mile TDL.

3.2.3 Human Food Chain Targets

Commercial Fishing:

There are no commercial fisheries in the Chena River. Commercial harvest for the Tanana River is estimated by statistical area. The TDL includes subdistrict 6C of the Tanana River, in the Upper Yukon Area. Approximately 6 percent of the subdistrict is within the 15-mile TDL. To calculate the total pounds of fish harvested within the TDL, START multiplied the number of fish harvested in the catch reporting subdistrict by the percentage of that subdistrict located within the 15-mile TDL. START then multiplied the number of fish harvested within catch reporting areas by the average weight of each fish species. Commercial harvest data, by fish species, are presented in Table 3-3.

Sport Fishing:

According to the Alaska Department of Fish and Game, sport fishing on the Chena River below the Moose Creek Dam for 2009 yielded an estimated 32 chinook salmon (*Oncorhynchus tshawytscha*), 50 chum salmon (*Oncorhynchus keta*), 18 sheefish (*Stenodus leucichthys*), 40 northern pike (*Esox lucius*), and 18 burbot (*Lota lota*) (ADFG 2009). Fishing of grayling is restricted to catch and release only (ADNR 2009). Approximately 25 percent of the reporting area is within the 15-mile TDL.

Sport fishing on the Tanana River for 2009 yielded an estimated 287 arctic grayling (*Thymallus arcticus*), 109 northern pike (*Esox lucius*), and 968 burbot (*Lota lota*) (ADFG 2009). Approximately 4 percent of the reporting area is within the 15-mile TDL.

To calculate the total pounds of fish harvested, START multiplied the number of fish harvested within the catch reporting areas by the average weight of each fish species. Sport fishing harvest data, by fish species, are presented in Table 3-4.

Subsistence Fishing:
According to the Alaska Department of Fish and Game, the estimated 2006 subsistence harvest for the catch area (Sub-district 6C on the Tanana River, District 6 of the Yukon River Drainage) was 963 fish (ADFG 2009a) Approximately 6 percent of the subdistrict is within the 15-mile TDL. To calculate the total pounds of fish harvested within the TDL, START multiplied the number of fish harvested in the catch reporting subdistrict by the percentage of that subdistrict located within the 15-mile TDL. START then multiplied the number of fish harvested within catch reporting areas by the average weight of each fish species. Subsistence harvest data, by fish species, are presented in Table 3-4. Data for subsistence fishing on the Chena River were not available.

3.2.4 Environmental Targets
No threatened or endangered species exist within the water bodies contained in the surface water migration pathway. Approximately 0.19 miles of wetland frontage exists along the surface water migration pathway TDL along the Tanana River (Zawistoski 2011).

3.3 Soil Exposure Pathway
The soil exposure pathway is evaluated based on the threat to residents and nearby populations from soil contamination within the first two feet of the surface.

3.3.1 Site Setting and Exposed Sources
Based on soil borings completed at the site, the subsurface consist of a ten feet of sandy gravel fill, which is underlain by fine to medium sand and sandy gravel (Woodward Clyde 1996). Results of a Phase II Environmental investigation indicate that petroleum- and PCB-contaminated soils are present on site. The petroleum-contaminated soils were greater than 3 feet bgs. The PCB-contaminated soils were within 0.5 feet of the surface; however, the surface area of contamination cannot be determined from the available information since only one sample contained PCBs.

Coal ash is transported off site and used as structural fill throughout Fairbanks for residential and commercial developments, as well as road construction. Analytical results of coal ash from the plant indicate significant concentrations of barium, lead, and mercury with respect to background concentrations. Since the coal ash has been used as fill throughout Fairbanks, the surface area of this contamination is not known.

3.3.2 Targets
There are 27 workers on site. No resources such as commercial agriculture, silviculture, livestock production, or commercial livestock grazing are known to occur on an area of exposed contaminated soil/material. No terrestrial sensitive environments are documented on an area of contamination at the site.

The site is fenced on the northern and eastern edges and is accessible on the western edge, which is adjacent to the Golden Heart Utility Water Treatment Plant.

The nearest residence is located across First Avenue, approximately 150 feet southwest of the plant. There are approximately 6,128 people residing within 1 mile of the site, and 2,758 students and teachers within 1 mile of the site (Zawistoski 2011).

3.4 Air Migration Pathway

The air migration pathway TDL is a 4-mile radius that extends from sources at the site (Figure 3-1). Prior to the installation of a full stream baghouse in 2006, a portion of the coal ash from the plant may have been potentially released into the atmosphere.

A nearby resident has reported black dust particles visible on the outside of the house, as well as on windowsills of windows left open. The resident is concerned that coal ash particles are impacting air quality in the area, and has filed a petition with the EPA regarding coal ash from the facility.

3.4.1 Human Targets

A total of 35,291 people are known to reside within 4 miles of the site. The nearest residence is located across First Avenue, approximately 150 feet southwest of the plant. In addition, a total of 11 schools with a total population of 15,126 students and 988 teachers are located within the 4-mile TDL (Zawistoski 2011). There are 27 workers on site. Population by distance ring is presented in Table 3-5.

3.4.2 Environmental Targets

No threatened or endangered species occur within 4 miles of the site (Zawistoski 2011). No resources such as commercial agriculture, commercial silviculture, or major or designated recreation areas occur within 0.5 miles of the site. There are approximately 1,512.16 acres of wetlands within the 4-mile TDL. Creamer's Field Migratory Waterfowl Refuge is located approximately one mile north of the site. Wetland acreage by distance ring is presented in Table 3-5.

4 Summary and Conclusions

The Aurora Energy Coal Power Plant is a coal-fired facility that generates electricity, steam heat, and hot water for Fairbanks customers. The plant operates four boilers and three turbine generators and has had a full-stream baghouse since 2006. The plant burns approximately 210,000 tons of coal per year. The site includes a coal handling facility on the north bank of the Chena River, which uses a conveyor belt to convey coal across the river to the power plant. Previous investigations determined that there was some subsurface petroleum-contaminated soil on site and that trace amounts of PCB also were present in one surface soil sample.

Potential sources include coal ash and coal dust. Coal ash is removed from the site by a contractor and used as fill material throughout Fairbanks as structural fill and road construction. Historically, coal ash was emitted into the atmosphere and may have impacted soils of the surrounding area. Analysis of the coal ash from the facility indicates that concentrations of barium, lead, and mercury were present at significant concentrations with respect to background concentrations.

Coal dust is incidentally deposited into the Chena River as the coal moves across the conveyor belt spanning this river. Aurora Energy has installed catchment bins to minimize coal dust falling into the river.

Ground water at the site is used by Golden Heart Utilities to supply the municipal water system for the city of Fairbanks. The water system consists of a total of four wells. These wells are located on the Golden Heart Utilities Water Treatment Plant property, located adjacent to the site to the west. Ground water at the site has been sampled and did not contain detectable concentrations of contaminants.

The surface water feature immediately adjacent to the site is the Chena River, which flows into the Tanana River. Sport fishing is known to occur on the Chena River. Commercial and subsistence fishing are known to occur on the Tanana River. No threatened or endangered species are present within the surface water migration pathway, and 0.19 miles of wetland frontage are present along the Tanana River.

Other potential targets include the nearby resident population. Approximately 35,291 people are known to reside within 4 miles of the site. Further, approxi-

mately 1,512 acres of wetlands exist within the 4-mile TDL. Creamer's Field Migratory Waterfowl Refuge is located approximately one mile north of the site.

5 References

ACAT (Alaska Community Action on Toxics) 2010, *Coal Ash in Alaska: Our Health, Our Right to Know – A Report on Toxic Chemicals Found in Coal Ash Waste in Alaska,* October 2010.

ADEC (Alaska Department of Environmental Conservation) 2006 Air Quality Operating Permit No. 315TVP02.

_____2002, NPDES Fact Sheet, Permit No. AK-005333-3.

_____1998, UST Facility Report, Facility ID 373, webpage http://dec.alaska.gov/spar/ipp/ust/search/fac_report.asp?FacilityID=373.

ADFG (Alaska Department of Fish and Game, Sport Fishing Survey) 2009, webpage http://www.adfg.alaska.gov/sf/sportfishingsurvey/index.cfm?ADFG=area.results accessed July 14, 2011.

_____2009a. Alaska Department of Fish and Game, *Alaska Subsistence Salmon Fisheries 2007 Annual Report,* Technical Paper No 346, Anchorage.

ADNR (Alaska Department of Natural Resources) 2011, Well Log Tracking System (WELTS) database search of wells, webpage http://www.navmaps.alaska.gov/welts/.

_____2009, Fishing in Chena River State Recreation Area webpage http://dnr.alaska.gov/parks/units/chena/fishing.htm.

Aurora Energy 2011. Coal Ash Results, provided in an email dated September 6, 2011 from Tammy Scholten of Aurora Energy to Brandon Perkins of EPA.

Fairbanks North Star Borough 2011, Fairbanks Urbanized Area Stormwater Management Program webpage http://www.co.fairbanks.ak.us/pworks/stormwatermanagementprogram.

EWG (Environmental Working Group) 2009, Tap Water Database 2009, webpage http://www.ewg.org/tap-water/home, access date August 5, 2011.

GHU (Golden Heart Utilities), May 2011, *Golden Heart Utilities Drinking Water Quality 13th Annual Water Quality Report.*

Glass, Roy. L, Michael R. Lilly, and David F. Mayer, 1996, *Ground-Water Levels in an Alluvial Plain Between the Tanana and Chena Rivers Near Fairbanks, Alaska*, 1986-93, prepared in cooperation with the Fairbanks North Star Borough, U.S. Geological Survey Water Resources Investigations Report 96-4060.

Kennedy, B.W., and Hall, C.C., 2009, *Occurrence of Selected Nutrients, Trace Elements, and Organic Compounds in Streambed Sediment in the Lower Chena River Watershed near Fairbanks, Alaska*, 2002–03: U.S. Geological Survey Scientific Investigations Report 2009-5067, 28 p.

FEMA (Federal Emergency Management Agency), January 2, 1992, *Flood Insurance Rate Map; Fairbanks North Star Borough, Alaska, Panel 184 of 400.*

NOAA (National Ocean Atmospheric Administration), 1973, *Western United States Precipitation Frequency Atlas*, Volume 2.

National Snow and Ice Data Center. 1998. *Nenana Ice Classic: Tanana River ice annual breakup dates*. Boulder, CO: National Snow and Ice Data Center.

Péwé, T.L., J.W . Bell, R.B. Forbes, and F.R. Weber (1976) Geologic map of the Fairbanks D-2 SE Quadrangle, Alaska. U.S. Geological Survey Series Map I-942.

USDOC (United States Department of Commerce), May 2001, *Profiles of General Demographic Characteristics: 2000 Census of Population and Housing: Alaska.*

USDOCWB (United States Department of Commerce Weather Bureau) 1963, Technical Paper No. 47, *Probable Maximum Precipitation and Rainfall-Frequency Data for Alaska.*

EPA (United States Environmental Protection Agency) 2005. News release: Aurora Energy pays $33,000 for violation of Clean Water Act, December 8, 2005, webpage http://yosemite.epa.gov/opa/admpress.nsf/27166bca9a9490ee852570180055e350/444d1fe4f05ac03e852570d90048101c!OpenDocument, accessed November 14, 2011.

_____2011. Petition submitted to EPA on May 16, 2011.

USGS (United States Geological Survey), 2010, National Water Information System, Tanana River at Nenana, AK Gauge 1551550 webpage http://waterdata.usgs.gov/nwis/nwisman/?site_no=15515500&agency_cd=USGS.

_____, 1999, *Ground Water Atlas of the United States: Alaska, Hawaii, Puerto Rico and the U. S. Virgin Islands*, Publication No. HA 730-N.

_____, 1988, *Element Concentrations in Soils and Other Surficial Materials of Alaska*, USGS Professional Paper 1458, by L.P. Gough, R.C. Severson, and H.T. Shacklette.

Usibelli 2011, Usibelli Coal Mine, Inc. Customers webpage http://www.usibelli.com/Mkting_custom.asp accessed August 18, 2011.

WRCC (Western Regional Climatic Center), February 2, 1877 to December 30, 2010, Fairbanks, Alaska, Period of Record, Monthly Climate Summary, webpage http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak2968.

Woodward Clyde 1996, *Phase II Site Investigation – Fairbanks Municipal Utilities System Power Plant, Fairbanks, Alaska*, May 1996.

Wydowski, Richard S. and Whitney, Richard L., 2003, *Inland Fishes of Washington*, Second Edition, University of Washington Press.

Zawistoski, Mark, August 12, 2011, GIS Analyst, Ecology and Environment, Inc., Memorandum to Ada Hamilton, START-3 Project Manager, Ecology and Environment, Inc. regarding GIS Information for Aurora Energy Coal Power Plant.

This page intentionally left blank.