Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Alaska

Cleaning Up Contaminated Sites Improves Water Quality

Waterbody Improved

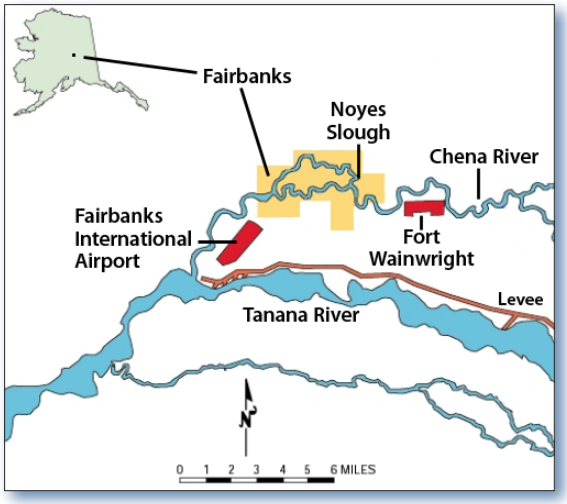
Seeps from contaminated soil and contaminated groundwater contributed petroleum hydrocarbons and other pollutants to Alaska's Chena River. As a result, the Alaska Department of Environmental Conservation (ADEC) added a 15-mile-long segment of Chena River to Alaska's 1994 Clean Water Act (CWA) section 303(d) list of impaired waters for petroleum hydrocarbons/oil and grease. Beginning in the mid-1990s, the U.S. Army cleaned up several contaminated areas. River monitoring data collected between 2005 and 2009 show that petroleum hydrocarbon levels now meet water quality standards, prompting ADEC to remove the Chena River from Alaska's 2010 CWA section 303(d) list of impaired waters for petroleum hydrocarbons/oil and grease.

Problem

The Chena River originates about 90 miles east of the city of Fairbanks in Interior Alaska and flows into the Tanana River about three miles southwest of the city (Figure 1). The Chena River flows through Fort Wainwright, a U.S. Army base that is on the National Priorities List as a site with known releases or threatened releases of hazardous substances, pollutants or contaminants. Areas of contaminated soil and groundwater were indentified around landfills, areas used for drum storage or disposal, and areas around pipelines and fuel-loading facilities. Several contaminated areas were directly next to the Chena River.

In 1992 and 1994 ADEC conducted statewide water quality assessments that indicated a suspected petroleum hydrocarbon problem on the Chena River. Documents on file indicated a visible sheen on the river, as well as reports of petroleum spills in the vicinity of the river. Reports also identified problems with elevated sediment levels in the river. Based on best professional judgment, ADEC added a 15-mile-long segment of the Chena River (Alaska ID Number 40506-007) to the 1994 CWA section 303(d) list as impaired by petroleum hydrocarbons/oil and grease and sediment. The impaired segment extends from the mouth of the Chena River upriver to Fort Wainwright.

Subsequent investigations indicated that contaminated sites on the Fort Wainwright military base were contributing most of the petroleum products to the Chena River. While conducting a Comprehensive Environmental Response, Compensation and Liability Act program investigation of the Chena River on Fort Wainwright, the U.S. Army found a number of samples that showed levels of petroleum-related compounds exceeding surface water and sediment criteria considered protective of aquatic life.



Map adapted from image by Ben Kennedy, USGS Water Resource Division

Figure 1. The Chena River is in eastern Alaska's Tanana River watershed.

Project Highlights

The contaminated sites at Fort Wainwright contributed petroleum products and other chemicals to the Chena River through surface runoff and groundwater flow. The U.S. Army completed physical cleanup activities at numerous contaminated Fort Wainwright sites between the late 1980s

and 2001 (Figure 2). For example, in 1985 the Army discovered a 45-acre area of contaminated soil and groundwater on an oxbow of the southern bank of the Chena River. The Army removed the contaminated soil between 1993 and 1996. Shortly thereafter, the Army installed a vapor extraction/air sparging treatment system to address groundwater contamination. A similar system was installed at a railcar off-loading facility site on the south bank of the Chena River. This area had been the site of numerous petroleum leaks and spills in the mid-1900s.

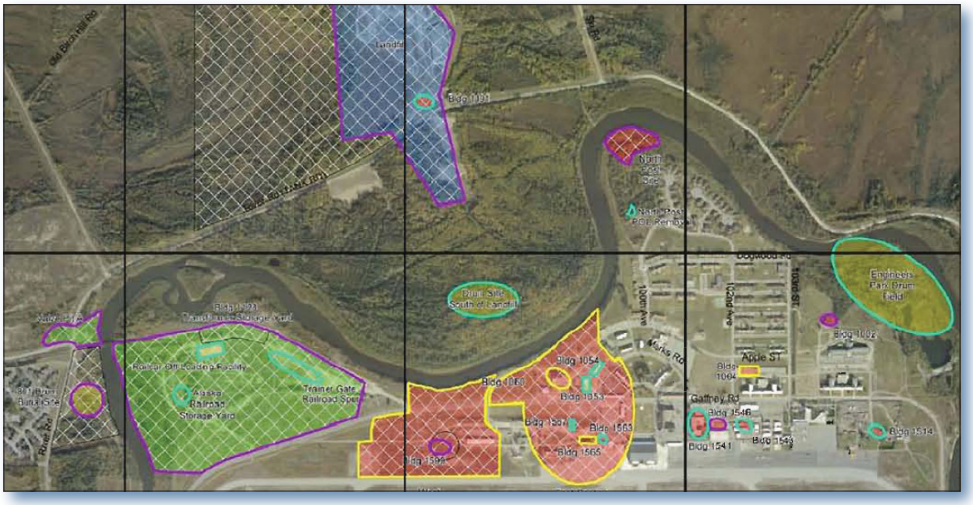


Figure 2. The Army cleaned up several contaminated areas (noted by cross-hatches and shading) next to the Chena River on Fort Wainwright.

Another area directly next to the Chena River had been used for drum storage from 1954 until 1974. The drums were reported to have contained diesel fuel, gasoline, jet fuel, solvents, asphalt, pesticides and lubricants. Between 1995 and 1997, the Army removed 226 drums and 850 cubic yards of contaminated soil. The Chena River also flows near an unlined landfill (installed in the early 1950s). Monitoring data from 1993 showed that the groundwater below the landfill was contaminated by numerous pollutants, including hydrocarbons that might be seeping into the Chena River. In 1997 the U.S. Army capped the inactive portion of the landfill to prevent rainwater from seeping through. In addition to cleanup projects that occurred near the Chena River, the Army completed numerous other remediation projects throughout the Fort Wainwright property.

Results

ADEC collected water samples and visually assessed the Chena River downstream of Fort Wainwright in 2005, 2007 and 2009. The sampling periods included low- and high-water events. ADEC water quality standards require that petroleum hydrocarbons not cause a film, sheen or discoloration on the surface or floor of the waterbody or adjoining shorelines, and that total aromatic hydrocarbons (TAH) not exceed 10 micrograms per liter. During visual assessments of the Chena River, ADEC found no sheens with odors or other characteristics typical of hydrocarbon sheens. Additionally, all samples met the TAH water quality standard; in fact, TAH results have been non-detect since 2005. Because the Chena River has met water quality standards for multiple years, ADEC removed it from the CWA section 303(d) list of impaired waters in 2010 for petroleum hydrocarbons/oil and grease. The river remains on the impaired waters list for sediment.

Partners and Funding

The U.S. Army coordinated with ADEC and the U.S. Environmental Protection Agency to investigate and remediate all known sources of environmental contamination on Fort Wainwright. The Army funded physical cleanup activities throughout the military base, including activities at numerous sites that were thought to be contributing petroleum hydrocarbons and other pollutants directly to the Chena River.

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