DETAILED ACTION PLAN
SHAGELUK CITY TANK FARM
WASTE EROSION ASSESSMENT & REVIEW (WEAR)
MAY 2015

The **Shageluk City Tank Farm** is located at latitude 62.657605 and longitude -159.534266 and was inspected for the Waste Erosion Assessment and Review (WEAR) project on September 11, 2013. The tank farm is owned and operated by the City of Shageluk. This site includes two tank farms, a shed containing potentially hazardous materials, and a variety of materials and debris.

Imagery Dated 2001. WEAR Map at http://dec.alaska.gov/eh/sw/wear.html

Community* – SHAGELUK – located on the east bank of the Innoko River, approximately 20 miles east of Anvik. The Innoko is a tributary of the Yukon River. Shageluk is a Deg Hit'an Athabascan community that relies on subsistence activities.

CONTAMINANT RISK

This site includes two adjacent tank farms, a shed, and an assortment of debris. The Shageluk City Tank Farm was in use from the late 1980s until 2013 and is considered a small site measuring approximately 0.34 acres. It is listed as an active site with the ADEC Contaminated Sites Program (File ID 2446.38.001) due to fuel spills in 1994 and 1995. The Contaminated Site database records that 35 drums of contaminated soil were taken to the landfill in 1994. However, the 2013 inspection noted approximately this number of soil-filled drums on site with alders growing in the soil in the drums. One of the two tank farms includes two fuel tanks (red and grey) in a lined earthen berm that, in 2013, held several inches of water. The tanks have a total capacity of around 12,500 gallons of diesel fuel. The second tank farm is approximately 130 feet north of the first and contains three grey fuel tanks in a lined earthen berm. Other items on the site include an old fire truck; a dilapidated shed filled with paint, corrosives, lead acid batteries, fluorescent bulbs, flammable pressurized gas cylinders; and insulation and 120-150 empty, black plastic 55-gallon drum from the former community freezer building. According to community residents, the plastic drums were removed from the freezer building around 2000, had been filled with salt water/brine when in use, and acted as insulation to keep food cold all year long before electrical refrigeration was available in the village. Large chunks of building insulation from the freezer building are also found on the site. Contaminants associated with fuels possibly include benzene and polycyclic aromatic hydrocarbons (PAHs), and potentially lead from leaded gasoline. These contaminants are known to cause cancer and other chronic diseases. Miscellaneous waste observed at the site may also contain chlorinated solvents, lead, mercury, and PCBs which also cause cancer and other chronic diseases. Additionally, the flammable pressurized gas cylinders pose a potential explosive or fire hazard.

This site is within the drinking water protection zone for the Shageluk Water System and is approximately 850 feet from the community's drinking water well. According to the Alaska Department of Environmental Conservation's (ADEC), Drinking Water Watch database, the well is monitored every 3 years for a group of volatile organic compounds (VOCs) related to fuel products. Per the 2011 testing results, VOCs were not detected. The site is approximately 320 feet from the nearest residential area, 800 feet north of the school, and within 10 feet from a subsistence area. Stressed vegetation was noted throughout the site.

Community Freezer Building (ADEC 2013)

Paints, Batteries, Misc. (ADEC 2013)

Tanks and Barrels (ADEC 2013)

Drums (ADEC 2013)

Tanks and Insulation (ADEC 2013)

Standing Water and Inactive Tank (ADEC 2013)

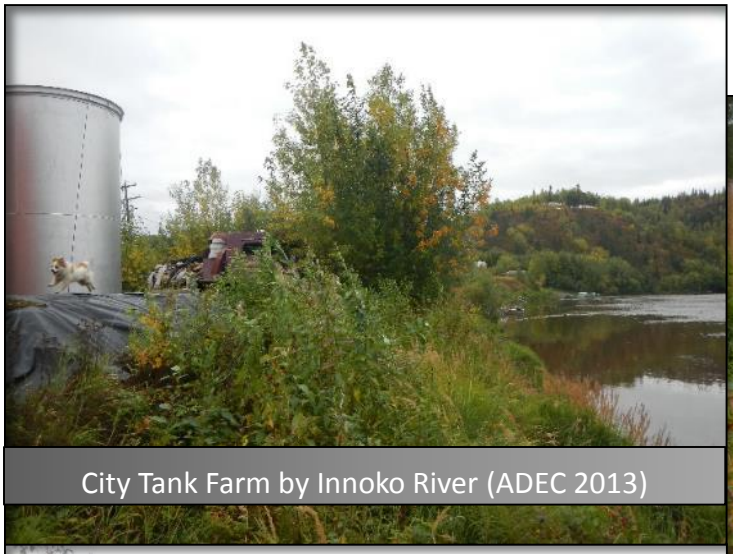
Roof Collapsed in Shed (ADEC 2013)

Red and Grey Tanks by River (ADEC 2013)

EROSION RISK

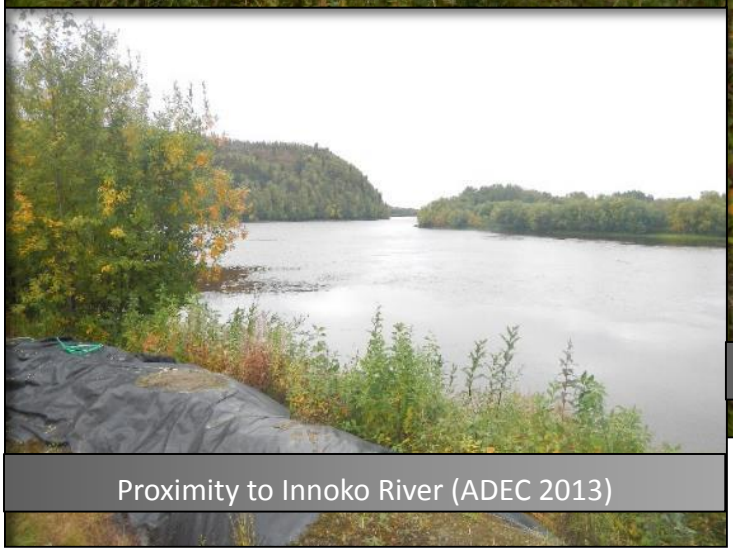
The US Army Corps of Engineers 2009 study, *Alaska Baseline Erosion Assessment* (BEA), lists an estimated erosion rate of 1-3 feet per year for Shageluk. During the 2013 inspection, the red and grey tanks were only 5 feet from the eroding riverbank and the other tanks were 10 feet from the riverbank. According to the BEA, periodic fluctuations in river flow and water levels, ice jams, spring break up, storm water runoff, and permafrost melt all contribute to erosion. The soil structure consists of silt and clay. Silt will stick together when wet, but will fall apart when dry, making it more easily eroded. However, clay soils are more difficult to erode as they stick together when wet or dry.

At current erosion rates, the site is estimated to be impacted around 2018.



City Tank Farm by Innoko River (ADEC 2013)

Erosion by City Tank Farm (ADEC 2013)



Proximity to Innoko River (ADEC 2013)

MITIGATION

There were no erosion mitigation measures in place as of 2013 in this area of the Innoko River.

Mitigation Options

A. **No Action** – If no action is taken to control erosion, the riverbank will eventually erode the tank farm, releasing contaminants into the river that could possibly impact nearby subsistence areas, and water quality of the Innoko River. The tanks and other materials could also cause navigation hazards to boat traffic.

B. **Remove Site** – Removing the tank farm, drums, structures, and other materials is another option. The tanks and other non-hazardous materials could be disposed of in the permitted Shageluk Landfill with the City's permission. Other potentially hazardous materials would need to be shipped out of the community for final disposal. The soil at the site should then be tested for fuel and other hazardous contaminants to determine if any further cleanup is needed.

C. **Erosion Mitigation** – Strong river currents, ice jams and spring break up are the primary causes of erosion on the Innoko River. The Department of Commerce, Community, and Economic Development's Division of Community and Regional Affairs handbook, *Understanding and Evaluating Erosion Problems,* suggests the best methods for protection against erosion from these causes are spur dikes, revetments, seawalls, vegetation, groins, beach fill, or relocation. The full list of suggested methods is provided in Table 2 of the document which is available online at http://commerce.state.ak.us/dnn/dcra/PlanningLandManagement.aspx. Since this tank farm is out of service and not likely to be used again, any decision to mitigate erosion at this location should be made with a larger focus and with consideration given to the potential benefits to the community from protecting structures and installations other than this tank farm.

SUMMARY

The Shageluk City Tank Farm poses a significant contaminant risk due to fuel contamination and miscellaneous waste, the close proximity to residences, and its location within the drinking water protection zone for the community water system. The Innoko River is actively eroding near this site and is estimated to reach the closest tanks around 2018. There is no current mitigation at this location.

RECOMMENDATIONS

As the Shageluk City Tank Farm is no longer in service, it is recommended to remove the site. The empty fuel tanks can be cut into smaller pieces for easier transport and disposal. The Shageluk Landfill is permitted and could accept many of the materials from this site. The contents of the shed (paint, corrosives, lead acid batteries, etc.) cannot be placed in the landfill and should be shipped out of the community. The soil should be characterized for any residual contamination and should be cleaned up as appropriate. Continued drinking water monitoring is recommended.

Imagery Dated 2001. WEAR Map at http://dec.alaska.gov/eh/sw/wear.html

Note: The above image does not include a 3rd grey tank with the northern group that is currently onsite and documented in this report.

*Community Database Online, Division of Community and Regional Affairs, Department of Commerce, Community and Economic Development

This document is funded in part with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program within the Department of the Interior's U.S. Fish and Wildlife Service.