



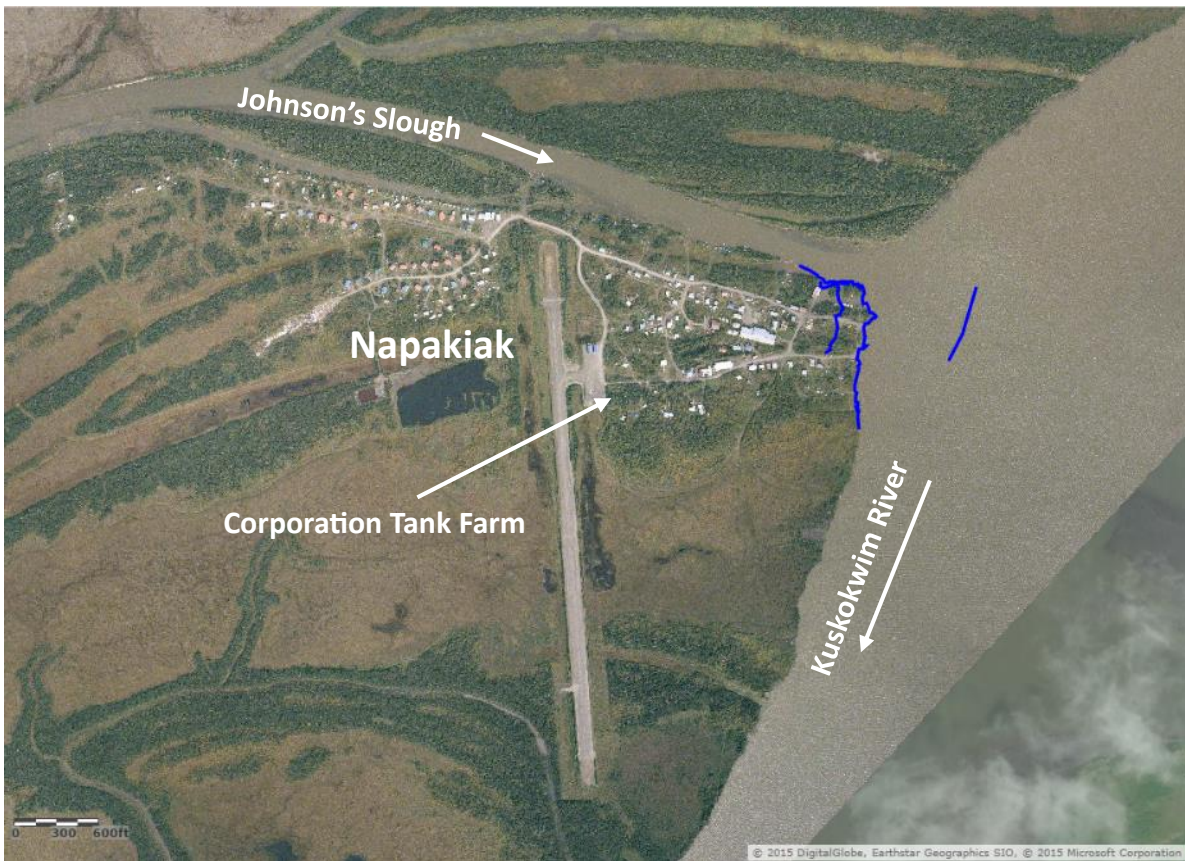
DETAILED ACTION PLAN

NAPAKIAK CORPORATION TANK FARM

WASTE EROSION ASSESSMENT & REVIEW (WEAR)

MAY 2015

The **Napakiak Corporation Tank Farm** is located east of the airstrip at latitude 60.693081 and longitude -161.976414 and was inspected for the Waste Erosion Assessment and Review (WEAR) project on June 21, 2013. This new tank farm, owned and operated by the Napakiak Corporation, is the primary fuel storage for the community.



Imagery Dated 2007. Note eroding shoreline in blue, from left to right: 2013, 2007, and 1991.

Community* – NAPAKIAK – Napakiak (population 387) is located on the north bank of the Kuskokwim River, 15 miles southwest of Bethel. It is located on an island between the Kuskokwim River and Johnson's Slough. Napakiak is influenced by storms in the Bering Sea and also by inland continental weather. The Kuskokwim River is typically ice-free from June through October. Napakiak is predominantly Yup'ik Eskimos who maintain a fishing and subsistence lifestyle. The city's primary priority in 2009 was to relocate all public facilities and homes to a bluff across Johnson's Slough, as the sandbar on which the city was built is severely eroding.



CONTAMINANT RISK

The Napakiak Corporation Tank Farm was completed in 2010 and has been in use since. It is categorized as small in size, having an area of 0.23 acres. The site is fully fenced with a locking gate, has secondary containment with a liner and dike, and is built above the surrounding area by several feet. The total capacity for the site is 103,000 gallons of fuel oil, diesel, and gasoline.

Possible contamination at the site is limited to fuels. Contaminants associated with fuels include volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs), which are known to cause cancer and other chronic diseases. Due to the tank farm's recent construction, secondary containment ensures that fuel spills inside containment cannot reach the soil, although future erosion could harm the integrity of the containment. Should the secondary containment become breached, contamination could have a serious impact on nearby soil, water, and subsistence resources. During the 2013 inspection no stressed vegetation was found nearby. The nearest residence was located 300 feet away. This site was within the drinking water source protection zones for all three of Napakiak's drinking water sources: two community sources and one transient source. According to the Alaska Department of Environmental Conservation's (ADEC), Drinking Water Watch database, the community sources are monitored for a group of VOCs related to fuel products. Although no VOCs have been detected over the drinking water standards, chloroform has been consistently detected at concentrations above the detection limit.



Corporation Tank Farm (ADEC 2013)



Corporation Tank Farm (ADEC 2013)



Corporation Tank Farm (ADEC 2013)

EROSION RISK

The Kuskokwim River is severely eroding the eastern banks of Napakiak. By comparing the Division of Community and Regional Affairs (DCRA) maps from 1991 and GPS points taken during the 2013 visit, it was found that Napakiak lost over 800 feet of shoreline in that 22-year period. This was consistent with the Army Corps of Engineers' 2009 study, *Alaska Baseline Erosion Assessment* (BEA), in which the erosion rate was calculated to be 35 feet per year. This extreme rate of erosion is due to several contributing factors. Napakiak is located on a silt-sand bar, a soil type that is very easily eroded by the Kuskokwim's river currents. Ice gouging, floods, and unstable river banks exacerbate the issue.

DCRA imagery from 2007 and a GPS point taken at the tank farm shows that this site was 1,500 feet from the 2007 shoreline. Using the BEA calculated erosion rate, it is estimated that this site will be impacted by erosion around 2050. Due to the Corporation Tank Farm's location, a large portion of the community will erode before the tank farm.



Aerial Photo Looking West (ADEC 2013)



Aerial Photo Looking East (ADEC 2013)



Kuskokwim River Erosion (ADEC 2013)



Kuskokwim River Erosion (ADEC 2013)

MITIGATION

According to information in the DCRA community database, in 2009 the community's priority was relocating Napakiak's public facilities and homes to a nearby, stable bluff where erosion will not be a threat. The 2013 visit found no evidence that relocation has begun.

Mitigation Options

- A. **No Action** – If no action is taken to control erosion or remove the structures, the eroding shoreline will eventually impact the Napakiak Corporation Tank Farm around 2050. This tank farm is a vital part of Napakiak's infrastructure, providing a source of fuel for all entities other than the school. If the site erodes, significant contamination would occur resulting from the release of petroleum products into the river. This would have severe consequences, as Napakiak's nearby water and subsistence areas would be contaminated.
- B. **Remove Site** – Removing or relocating the Corporation Tank Farm and possible associated contaminated soil will mitigate the contaminant risk for the site. As the community's fuel source, this action should be considered in conjunction with the relocation of the community itself. This action will require planning and a significant amount of money.
- C. **Erosion Mitigation** – Currents are the primary cause of erosion on this riverbank. With the extreme rate of erosion, though, erosion mitigation would be expensive and success would not be guaranteed. However, the DCRA handbook, *Understanding and Evaluating Erosion Problems*, suggests the best methods for protecting against erosion due to currents are spur dikes, revetments, seawalls, vegetation, groins, beach fill, or relocation. The full list of suggestions is provided in Table 2 of the document which is available online at <http://commerce.state.ak.us/dnn/dcra/PlanningLandManagement.aspx>.

SUMMARY

The Corporation Tank Farm is located on the eastern side of the airstrip and was constructed in 2010. It is 0.23 acres in size and has a total capacity of 103,000 gallons of fuel. It is 300 feet from the closest residence and is within all 3 of the drinking water protection zones in the community.

The Kuskokwim River lies 1500 feet away and is eroding the shoreline at a rate of 35 feet per year (calculated by BEA). There are no erosion mitigation controls for this site. Erosion is estimated to impact this site around 2050.

RECOMMENDATIONS

Erosion mitigation is not recommended at this time as this site is not estimated to be impacted by erosion until 2050 at current erosion rates. It is recommended to monitor erosion rates on an annual basis and to continue to monitor the 2 community drinking water sources for VOCs.

The Corporation Tank Farm provides essential fuel storage but will eventually be threatened by erosion. It is recommended to relocate this site to the new community location in conjunction with the community relocation itself. It is not too early to begin planning for and finding ways to fund the relocation of the tank farm, as erosion from the Kuskokwim River is quickly threatening the entire community.



Imagery Date approx. 2011. WEAR Map at <http://dec.alaska.gov/eh/sw/wear.html>

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

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