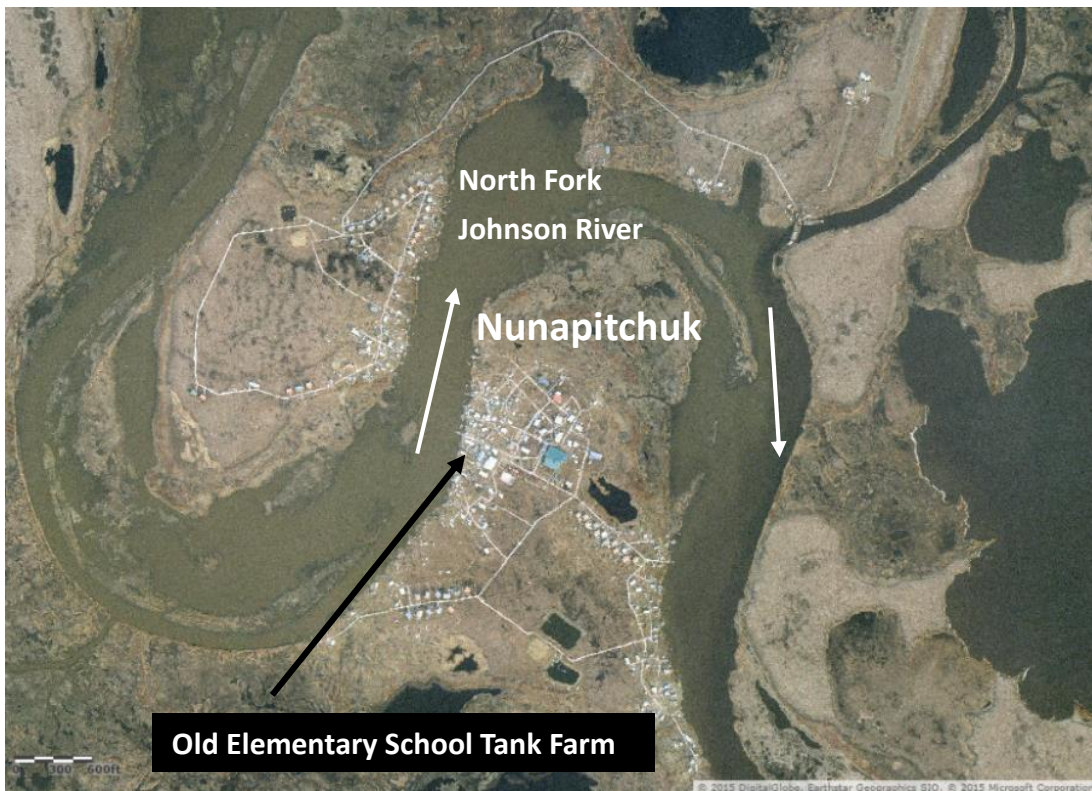




DETAILED ACTION PLAN NUNAPITCHUK OLD ELEMENTARY SCHOOL TANK FARM WASTE EROSION ASSESSMENT & REVIEW (WEAR) MAY 2015

The **Nunapitchuk Old Elementary School Tank Farm** provides fuel storage for the Lower Kuskokwim School District (LKSD). The landowner is the State of Alaska Department of Education (via Quit-Claim Deed, USS 4049 Lot 1); it is unknown if the tanks are still owned by the School District. The tank farm was operated by the LKSD for the former elementary school. Although the elementary school has been since consolidated with the high school, the tanks appear to be in use. This tank farm is located on the south bank of the North Fork Johnson River, about 500 feet west of the LKSD school, at latitude 60.896408 and longitude -162.460306. The Old Elementary School Tank Farm was inspected for the Waste Erosion Assessment and Review (WEAR) project on July 7, 2014.



Imagery Dated 2007. WEAR Map at <http://dec.alaska.gov/eh/sw/wear.html>

Community* – NUNAPITCHUK – Nunapitchuk (population 583) is located on both banks of the Johnson River, 22 miles northwest of Bethel in the Yukon-Kuskokwim Delta. Nunapitchuk is a Yup'ik Eskimo village, and residents are involved in commercial fishing and subsistence activities.



CONTAMINANT RISK

The Old Elementary School Tank Farm has been in use since around the 1970s, based on the visual degradation, rust, and age of the elementary school. The tank farm is categorized as small in size, having an area of 0.04 acres. This tank farm includes five yellow vertical diesel tanks within a wooden diked and fenced area. It is unknown if the containment area is lined. The tanks have a total capacity of 44,750 gallons, and the tanks appear to be connected and in use. Some stained, dead vegetation as well as ponded water with sheen was present directly outside of the tank farm between the wooden wall and the boardwalk.

Possible contamination at the Old Elementary School Tank Farm is diesel fuel. Contaminants associated with diesel fuel include volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). These contaminants are known to cause cancer and other chronic diseases. Contamination could have a serious impact on nearby soil, water, and subsistence resources. The nearest residence is located 80 feet away. This site is within the community's drinking water protection zone. According to the Alaska Department of Environmental Conservation's (ADEC) Drinking Water Watch database, this groundwater water system is sampled yearly for VOCs. Although no VOCs were detected above the drinking water standards, in 2013 xylenes were detected but well below drinking water standard. Xylenes have not been detected in subsequent samples.



Old Elementary School Tank Farm (ADEC 2014)



Side View (ADEC 2014)



Sheen (ADEC 2014)



Dead Vegetation (ADEC 2014)

EROSION RISK

During the 2014 visit, the riverbank nearest to the Old Elementary School Tank Farm was identified as an erosion concern. The Army Corps of Engineers' 2009 study, *Alaska Baseline Erosion Assessment (BEA)*, estimated an erosion rate of 1 foot per year based on a community erosion survey. ADEC estimated the erosion rate at 4 feet per year by comparing GPS points taken on the riverbank during the visit to dated aerial images. Erosion rates may vary by season, year, and even section of river bank. The North Fork Johnson River is slow moving in the Nunapitchuk vicinity. Possible causes or contributing factors for erosion in Nunapitchuk are natural riverine processes, ice gouging in the spring, melting permafrost, and human influence from boat wakes and land use that diminishes the stability of the banks.

The Old Elementary School Tank Farm was 60 feet from the eroding banks of the North Fork Johnson River in 2014. Using the erosion rate estimate of 4 feet per year, it is estimated that the site will be impacted around 2029.



North Fork Johnson River, south bank erosion (ADEC 2014)



Eroding Riverbank (ADEC 2014)



Proximity to River (ADEC 2014)



Taking GPS points (ADEC 2014)

MITIGATION

There were no mitigation measures to protect the riverbank near the Old Elementary School Tank Farm as of the 2014 WEAR inspection.

Mitigation Options

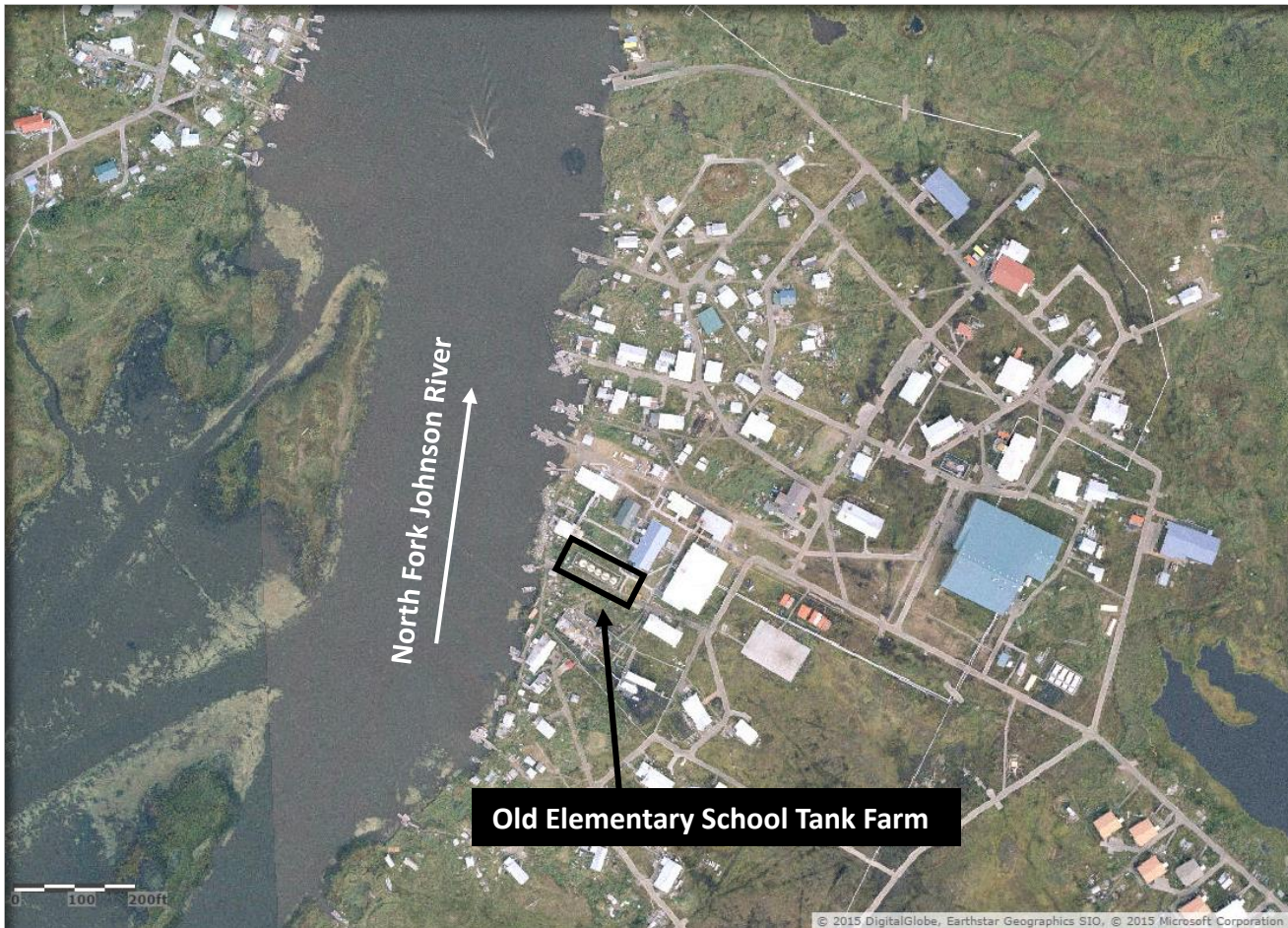
- A. **No Action** – If no action is taken to control erosion or remove the site, the eroding shoreline will eventually impact the Old Elementary School Tank Farm. This is estimated to happen around 2029. The tanks will cause navigation hazards and the release of diesel fuel and any soil contamination into the river will likely harm water and subsistence resources.
- B. **Remove Site** – Removing or relocating the Old Elementary School Tank Farm before erosion reaches the site and cleaning up any contaminated soil would eliminate the contaminant risk and navigation hazard from the site. Without a contaminant risk, erosion of the site would not impact water or subsistence resources. This action would require planning, money, and equipment to move them to a safe location or remove the tanks for backhaul. Soil under the tank farm should also be tested for contamination and remediated if necessary.
- C. **Erosion Mitigation** – Currents, ice, and waves are the primary cause of erosion on this riverbank. The Department of Commerce, Community, and Economic Development’s Division of Community and Regional Affairs handbook, *Understanding and Evaluating Erosion Problems*, suggests best methods for protecting against erosion caused by currents, ice, or waves are breakwaters, 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>. Additionally, human influenced erosion can be mitigated by changing land use patterns in eroding areas.

SUMMARY

The Old Elementary School Tank Farm poses a significant contaminant risk due to fuel, the close proximity to residences, and its location within the drinking water protection zone for the community water system. The North Fork Johnson River is eroding at an estimated rate of 4 feet per year; erosion is estimated to impact this site around 2029. There are no erosion mitigation controls for this site.

RECOMMENDATIONS

The Old Elementary School Tank Farm provides key infrastructure in the form of fuel storage and at the current erosion rate it is expected to be impacted by 2029. It is recommended to install erosion mitigation measures to not only protect the tank farm but also other key community infrastructure. Removal of the tank farm and any associated contaminated soil may be necessary should erosion mitigation measures be ineffective or impractical. It is necessary to begin planning for and finding ways to fund erosion mitigation efforts or the removal and cleanup of this site before it is eroded.



Imagery Dated 2007. 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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