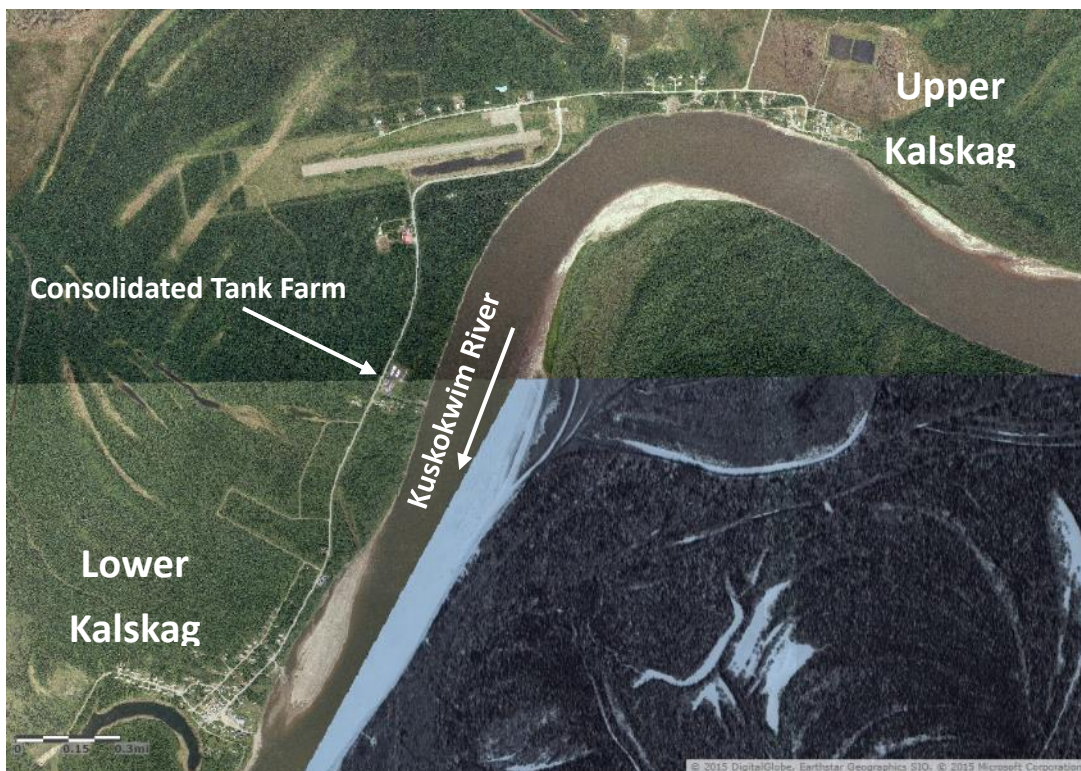




DETAILED ACTION PLAN KALSKAG CONSOLIDATED TANK FARM WASTE EROSION ASSESSMENT & REVIEW (WEAR) MAY 2015

The **Kalskag Consolidated Tank Farm** functions as fuel storage for the Kuspuk School District, Lower Kalskag, and Upper Kalskag. It is located between Lower and Upper Kalskag at latitude 61.526208 and longitude -160.348904 and was inspected for the Waste Erosion Assessment and Review (WEAR) project on June 20 and 21, 2012.

The construction of the site was funded through the Denali Commission and Alaska Village Electric Cooperative (AVEC). The land is within the Lower Kalskag city boundaries and is shared between three entities: the Kuspuk School District, Lower Kalskag, and Upper Kalskag.



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

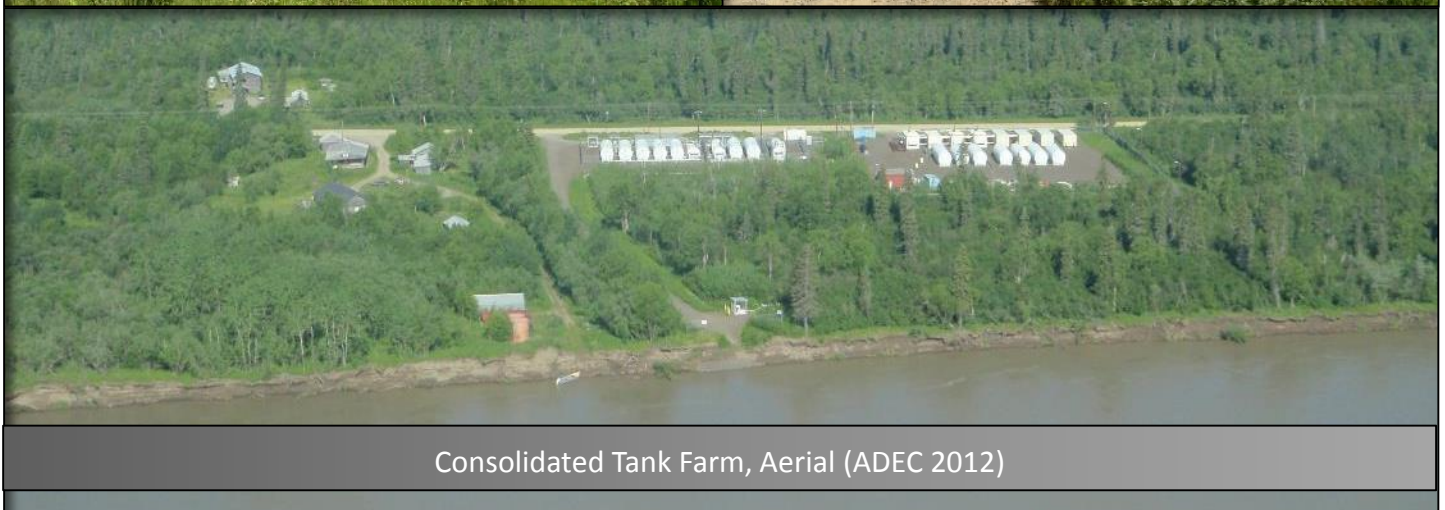
Community* – KALSKAG – The Kalskag area consists of two predominately Yup'ik Eskimo communities: Lower Kalskag (population 281) and Upper Kalskag (population 231). These communities are located on the north bank of the Kuskokwim River, 30 miles west of Aniak. Upper Kalskag was strongly influenced by the Roman Catholic Church while Lower Kalskag consists of Russian Orthodox practitioners who relocated from Upper Kalskag in the 1930s. Subsistence activities provide food sources for both communities.



CONTAMINANT RISK

The Consolidated Tank Farm was built in 2004 and is currently in use. This site was classified as medium in size, having an area of 2.5 acres. This tank farm has a total capacity of 503,112 gallons of diesel and gasoline fuels. The nearest residence is located 190 feet away.

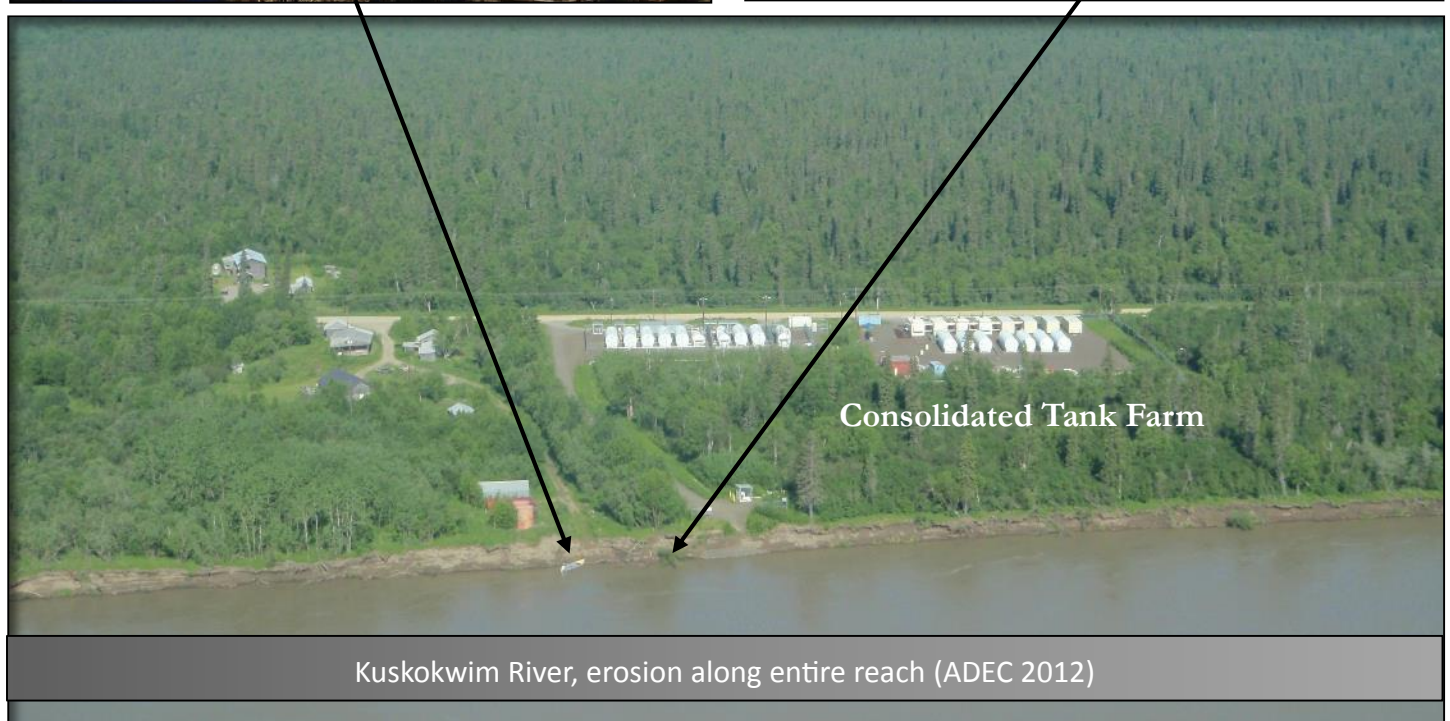
Possible contamination at the Consolidated Tank Farm is fuels. Contaminants associated with fuels include benzene and polycyclic aromatic hydrocarbons (PAHs). These contaminants are known to cause cancer and other chronic diseases. Any fuel contamination at this site should be blocked from entering the environment by the tank farm's secondary containment system. Should this site's containment be damaged by erosion or other sources, contamination could have a serious impact on nearby soil, water, and subsistence resources. This site is within the drinking water protection zone for the Lower Kalskag's groundwater system. According to the Alaska Department of Environmental Conservation's (ADEC), Drinking Water Watch database, the system is monitored for a group of volatile organic compounds (VOCs) related to fuel products. Although no VOCs were detected over the drinking water standards, xylenes were found in the 2013 sampling event at a concentration above the detection limit but well below standards. VOCs detected in the drinking water are not necessarily related to this site.



EROSION RISK

According to the Army Corps of Engineers' 2009 study, *Alaska Baseline Erosion Assessment (BEA)*, the main cause of erosion in this section of the Lower Kuskokwim River is ice gouging during spring breakup. The river narrows downstream, causing ice to back up and batter the Kalskag riverbanks. The soil in this area is predominately silt, which erodes easily. The BEA sectioned the riverbank into different reaches for which erosion rates were calculated. These rates range from 1.5 feet per year at the south end of Lower Kalskag to 9 feet per year in the area between Lower and Upper Kalskag, where this tank farm is located.

The Consolidated Tank Farm was 435 feet away from the Kuskokwim River at the time of the site visit in 2012. Using the 9 feet per year erosion rate calculated for the reach by the BEA, it is estimated that the site will be impacted by erosion in 2060, 48 years after the 2012 inspection.



MITIGATION

There were no mitigation efforts associated with this site as of the 2012 WEAR inspection.

Mitigation Options

- A. **No Action** – If no action is taken to control erosion or remove the site, shoreline erosion will eventually impact the Consolidated Tank Farm. This is estimated to happen around 2060. Erosion of the site would be a loss of critical infrastructure for both communities and could cause Kuskokwim River navigation hazards. Additionally, the release of fuel contamination would be detrimental to water and subsistence resources.
- B. **Remove Site** – Removal or relocation of the Consolidated Tank Farm before erosion reaches the site would remove the chance of navigation hazards. Removing the site and cleaning up any associated contaminated soil would additionally eliminate contaminant risk. Without contaminant risk, erosion of the site would not impact water or subsistence resources. Although removing the site is a solution, it is not practical in the short term as the site provides key infrastructure in fuel storage for Lower and Upper Kalskag.
- C. **Erosion Mitigation** – Slowing the rate of erosion while the site is still over 400 feet from the river could both protect key infrastructure as well as human health and the environment for the lifespan of the tank farm. 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 protecting against erosion caused by ice gouging are insulation, vegetation, 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>.

SUMMARY

The Consolidated Tank Farm poses a contaminant risk due to fuel contamination, the close proximity to residences, and location within the drinking water protection zone for the community water system. The tank farm poses an erosion risk as the Kuskokwim River is actively eroding and erosion is estimated to impact the tank farm by 2060. There are no erosion mitigation controls for this site.

RECOMMENDATIONS

It is recommended to monitor erosion rates near the Consolidated Tank Farm on an annual basis. As erosion may accelerate and impact the tank farm sooner than expected, it is recommended to begin planning for and finding ways to fund either the relocation of the tank farm or mitigation installation. Lower Kalskag should continue to monitor the drinking water system for VOCs per the Drinking Water Program.

The communities should determine if installing mitigation or relocating the tank farm to a safer location would be more beneficial as a long-term solution. Slowing the erosion rate by installing mitigation would both protect key infrastructure, as well as human health and the environment, for the lifespan of the tank farm. Relocating the tank farm to a safer location would also eliminate the environmental and health risks; however, obtaining both communities' buy-in for a new location and landowner permission could be a long-term process. The costs and benefits of each option should be carefully considered.



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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