

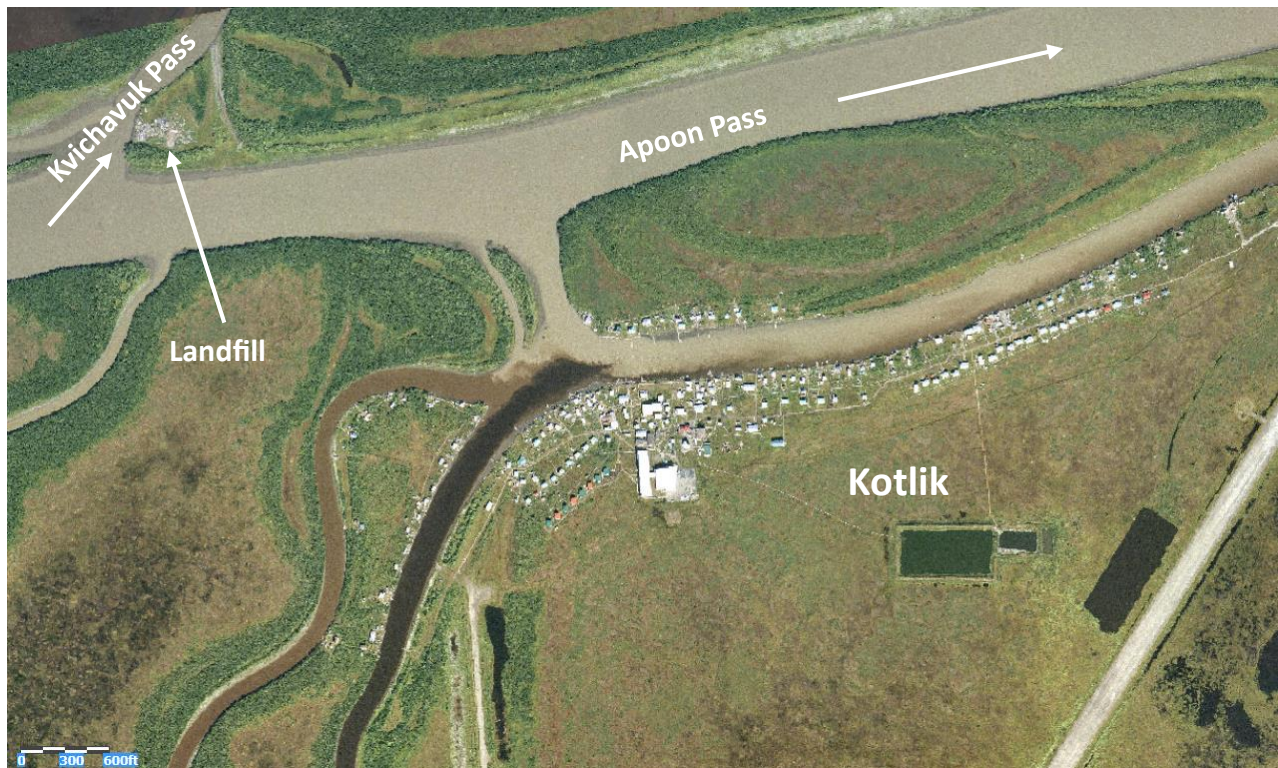


DETAILED ACTION PLAN KOTLIK LANDFILL

WASTE EROSION ASSESSMENT & REVIEW (WEAR) MAY 2015

The **Kotlik Landfill** is an unpermitted site located at latitude 63.038045 and longitude -163.575294, upstream and across the river from the village. It is located at the confluence of Kvichavuk Pass and Apoon Pass, which flow into the Yukon River and was inspected for the Waste Erosion Assessment and Review (WEAR) project on July 11, 2012.

The City of Kotlik operates the landfill, with two part-time operators employed to manage the site. The landfill is a self-haul site with no waste collection system, so residents must take their own waste to the landfill. The site, located across the river, is only accessible by boat in the summer and by snow machine in the winter, with extended periods of inaccessibility during spring break-up and fall freeze-up. An excavator is driven across the frozen river each winter for landfill maintenance and trash consolidation.



Imagery Dated 2006. WEAR Map at <http://dec.alaska.gov/eh/sw/wear.html>

Community* – KOTLIK – Located on the east bank of Kotlik Slough, 35 miles northeast of Emmonak and 165 miles northwest of Bethel. The riverbank is used for a variety of community activities including: boat, ATV, and snowmachine access, boat storage, fishing, and hunting.



CONTAMINANT RISK

The Kotlik landfill has been in operation since the 1970s, is located approximately 3,200 feet upstream and across the river from the village, and is approximately 27 miles from a critical habitat area. It is considered a medium-sized site, measuring approximately 4.5 acres. Uncovered waste is spread out across the site. This site includes burned and unburned municipal solid waste (MSW) and construction and demolition debris possibly including asbestos. Although the landfill appeared somewhat organized during the 2012 site visit, waste was not covered. Residents often open burn their waste at the landfill. The landfill is susceptible to flooding in the spring and fall. Waste is pushed back several times a year to prevent it from washing away in the river.

Rural communities generate smaller volumes of MSW than larger urban communities; however, these smaller landfills pose significant risks if not designed or operated appropriately. MSW may include household hazardous waste (HHW) from cleaners, automotive maintenance, batteries, paints, etc., that if not managed appropriately can be a concern. Contaminants associated with HHW may include solvents and heavy metals, such as lead, which are known to cause health effects. This site contains construction and demolition (C&D) debris that is a concern due to the possible presence of asbestos-containing materials. Asbestos was widely used in construction materials prior to the 1980s and remains in many rural communities in their older structures. Asbestos is known to cause lung cancer, but does not pose a health risk if it remains contained and is not released to the environment. Asbestos released to water due to erosion is less of a health concern; however, asbestos fibers released to the air pose a more significant risk to human health and the environment. Once asbestos fibers are released they are difficult to clean up, which can result in both short term and long term impacts. Burning waste can produce contaminants such as dioxins, gases, heavy metals, and polycyclic aromatic hydrocarbons (PAHs). Many of these contaminants are persistent in the environment, can bioaccumulate, and have known toxic effects. Erosion of these contaminants from the landfill site could cause farther reaching impacts.

The landfill is upstream of the surface water intake for the Kotlik Water System and is within the drinking water protection zone. According to the Alaska Department of Environmental Conservation's (ADEC), Drinking Water Watch database, the water system is tested for heavy metals, volatile organic compounds (VOCs), and other contaminants. Several heavy metals and VOCs have been detected over the years. The landfill is also 27 miles upstream from a critical habitat area for spectacled eider.



Exposed Municipal Waste (ADEC 2012)

Waste Spread throughout Site (ADEC 2012)



Smoldering Waste (ADEC 2012)



Construction and Demolition Debris (ADEC 2012)



River Access to Landfill (ADEC 2012)



Burn Units (ADEC 2012)



Aerial of Landfill (ADEC 2012)

EROSION RISK

The US Army Corps of Engineers 2009 study, *Alaska Baseline Erosion Assessment (BEA)*, lists an estimated erosion rate of 3 feet per year along the banks of the landfill. During the 2012 WEAR site inspection, the landfill was only 15 feet from the eroding riverbank. According to the BEA, natural fluctuations in flows and water levels, flooding, ice jams, spring break up, and wave action from boat wakes and wind reportedly contribute to bank erosion. The soil structure of silt and clay is more likely to erode than other soil types and is weakened with the semi-annual thaw-freeze cycle.

Erosion is estimated to impact the landfill by 2016.



MITIGATION

As of 2012, there were no erosion mitigation measures for this site. However, several times a year, community members manually move the waste back from the riverbank to prevent it from washing into the river.

Mitigation Options

- A. **No Action** – If no action is taken to control erosion, the riverbank will erode the landfill by about 2016, potentially releasing contaminants into the river that could possibly impact nearby subsistence areas and the downstream, surface water drinking water source for Kotlik. Current actions from the community include moving waste back from the riverbank as it erodes, but this is a short-term solution as the landfill is surrounded by water on four sides.
- B. **Remove Site** – Removing waste from the landfill site will mitigate the contaminant risk for the site. This will involve digging up all of the waste at the site and moving it to another location. This action would likely require multiple years of planning and a significant amount of money. Some of the steps involved would be: determine the location for a new landfill, obtain community and landowner buy-in, obtain funding to design and construct the new landfill and also funding to remove waste from the current landfill to the new site. The new landfill would also need to be approved and permitted through the ADEC Solid Waste Program.
- C. **Erosion Mitigation** – Strong river currents, ice jams and spring break up are primary causes of erosion at this site. The Department of Commerce, Community, and Economic Development's Division of Community and Regional Affairs (DCRA) handbook *Understanding and Evaluating Erosion Problems* suggests the best methods for protecting against erosion by 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>. However, given that the landfill site is located on an actively eroding island, finding an effective erosion mitigation may prove challenging.

SUMMARY

The Kotlik Landfill is located across the river from the community and is inaccessible for several weeks each year during break-up and freeze-up conditions. This unpermitted landfill is located on an island eroding on three sides with a seasonal slough on the fourth side. The Apoon Pass riverbank is actively eroding and if left unaddressed, has the potential to impact the landfill by 2016. Erosion of this landfill could release contaminants that may impact subsistence areas and Kotlik's surface water intake source for drinking water. Boat traffic could also experience navigation hazards from waste eroding into the river.

RECOMMENDATIONS

The ADEC Solid Waste Program recommends the community construct a new permitted landfill, ideally located on the same side of the river as the community to provide year-round access to the site. Removal of the existing landfill, with disposal of waste into the new landfill is then necessary to address contaminant risk.

Until a new landfill can be constructed, the community should continue to use the current landfill, and move the waste away from the encroaching riverbank several times a year using heavy equipment. Signs should be posted along the river bank informing residents to take waste to the interior of the site.



Imagery Dated 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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