



DETAILED ACTION PLAN EMMONAK LANDFILL

WASTE EROSION ASSESSMENT & REVIEW (WEAR) MAY 2015

The **Emmonak Landfill** is located at latitude 62.775086 and longitude -164.505094. The landfill is on the east side of the community along the airport access road. This site was inspected for the Waste Erosion Assessment and Review (WEAR) project on July 9, 2012 and was re-visited on July 10, 2014.

The landfill is a self-haul site with a part-time operator. The site is approximately 5 acres in area with waste spread throughout the site. The landfill is located approximately 350 feet from an actively eroding bank of the Yukon River. Trash was observed along the bank for about 100 yards. The landfill is located approximately 4,500 feet upstream of the village water supply. It is reported that the majority of erosion occurs in the spring when the river breaks up and ice scours the banks.



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

Community* – Emmonak – The community is located at the mouth of the Yukon River, 10 miles from the Bering Sea, on the north bank of Kwiguk Pass. It lies 120 air miles northwest of Bethel and 490 air miles from Anchorage, in the Yukon Delta National Wildlife Refuge.



CONTAMINANT RISK

The Emmonak Landfill has been in operation since the 1960s. It is categorized as a large site, measuring 5 acres. The landfill is 350 feet from subsistence use areas and 3,000 feet from the nearest residences.

Contaminants associated with this landfill include municipal solid waste (MSW), burned MSW, and construction and demolition debris. 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 vehicle maintenance, batteries, paints, etc. Contaminants associated with HHW may include heavy metals, such as lead, which are known to cause health effects. Burning waste can pollute the air, soil, and water with 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.

The Emmonak Landfill is within the drinking water protection zone for the Emmonak Water System, which is a surface water supply whose summer intake is 4,500 feet downstream of the site. According to the Alaska Department of Environmental Conservation's (ADEC), Drinking Water Watch database, the system is tested for heavy metals, volatile organic compounds (VOCS), and other contaminants per the ADEC Drinking Water Program. To date, none of those contaminants have been detected.



EROSION RISK

The US Army Corps of Engineers (ACOE) 2009 study, *Alaska Baseline Erosion Assessment (BEA)*, lists an estimated erosion rate of 2 to 25 feet per year for Emmonak. According to the BEA, seasonal fluctuations in river flows and water elevations, flooding, ice jams, spring break up, boat traffic, pedestrian and vehicle traffic along the beaches and banks, above normal high tides, and storm surges all contribute to the erosion. During the WEAR inspection residents reported that ice and strong currents were the main contributors to erosion. The soil at this site is sand and silt which is more easily eroded from the river current and storms than other soil types.

The Emmonak Landfill was 350 feet from the Yukon River in aerial imagery from 2006. GPS coordinates taken in 2014 were compared with the 2006 imagery. From this, ADEC estimates that land along the airport access road is eroding at 7 feet per year. Based on this erosion rate estimate, the landfill will be impacted by 2056.



MITIGATION

There were no erosion mitigation measures for this site as of 2014, although most of the community is protected from erosion by a revetment of armor stone constructed with state legislative grant funds and a rip rap project constructed in 1998 by the ACOE. These projects provide erosion protection along a 1,443-foot portion of riverbank in front of the fish processing plant, Alaska Commercial company store, and other erosion-threatened structures.

Mitigation Options

- A. **No Action** – If no action is taken to control erosion, the riverbank will continue to erode closer to the landfill. The landfill contains municipal solid waste (MSW) and MSW ash. The airport access road will erode first if no actions are taken, eliminating access to the landfill. The landfill is estimated to erode around 2056, releasing contaminants and debris into the river that could possibly impact nearby subsistence areas and the downstream, surface water drinking water source for Emmonak.
- B. **Remove Site** – Removing the landfill will mitigate the contaminant risk for the site. This will involve digging up all of the waste and affected soil at the site, moving it to another location, and collecting post-removal samples to ensure no contamination remains. This action will require planning and a significant amount of money. Some of the steps involved would be: determine the location of all the MSW, obtain community and landowner buy-in for a new landfill location, and find funding for equipment and removal and reburial of the MSW, and the treatment or disposal of any contaminated soil.
- C. **Erosion Mitigation** – Ice, spring breakup, and currents are the primary causes of erosion on this riverbank. There are already 2 mitigation measures in place for Emmonak that have proven to be effective. Either of these options could be used to protect the landfill from erosion.

SUMMARY

The Emmonak Landfill poses a contaminant risk as there is evidence of burning and municipal solid waste, the close proximity to residences, and location within the drinking water protection zone for the community water system. The landfill poses an erosion risk as the Yukon River is actively eroding the riverbank and erosion is estimated to impact the landfill by 2056. There is no current erosion mitigation for this site.

RECOMMENDATIONS

The Emmonak Landfill provides key infrastructure as it is the community's waste disposal site. Erosion mitigation is recommended not only to protect the landfill, but to also protect the airport access road that is actively eroding. Riprap is installed just west of this site. Extending this protection, or the revetment of armor stone, would likely be effective as it has been successful in their current locations.

The Emmonak Water System should continue to monitor for VOCs and heavy metals to ensure no contaminants are impacting it.



Imagery Dated 2006. 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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