

LEFT OUT IN THE COLD:

Solid Waste Management and the Risks to Resident Health in Native Village Alaska



Dump drawing, Rene'e Avugiak April, 2001

Analysis of results from Central Council of Tlingit and Haida Indian Tribes' Solid Waste Management (SWM) Survey and Village Health Study, Yr 2000 - 2001, and additional data as cited.

Overview

There are 200-plus isolated and rural native villages in Alaska, and more than nine in ten of these have a community dump for their waste disposal needs. Due to logistical, infrastructural, and economic difficulties, in all but a few cases, anything transported to the villages stays in the villages. The unlined village dump is the end destination for construction wastes, hazardous wastes, vehicles, appliances, and animal carcasses, as well as run-of-the-mill trash.

The vast majority of native village waste disposal sites are open dumps.

- ✓ Although the exempted Alaska State standards are much less stringent than federal regulations, less than 5 percent of isolated native village dumps are permitted.
- ✓ Less than 30% of villages even have an SWM plan.

**Due to understaffing, little management occurs at village dumps.**

- ✓ Only 33% of villages have any funding for their SWM programs (including dump site operation).
- ✓ As a result, only 32% of villages have even a part-time dumpsite operator/manager.
- ✓ Many of those operators and managers are likely under-trained or under-experienced.
- ✓ Updating the database revealed that 45 percent of Village SWM contacts had left or changed jobs within just 2 years.

In part because the dumps are not managed, village dumps run out of space quickly, and at least 57% of villages are in imminent need of a new dump site or new waste disposal method.

- ✓ A full 38% percent of villages do not even have access to working heavy equipment.
- ✓ Trenching wastes to confine and reduce volume is often impossible due to underlying permafrost or a high ground water table.
- ✓ Compacting wastes can be problematic at the majority of dumps located on tundra. Without expensive gravel roads and a permafrost-engineered underlayer, equipment rapidly gets stuck and/or accumulatively degrades marshy tundra.

Community education about proper solid waste disposal behavior is listed as the second highest SWM need by tribes. But even with adequate community education, it would be difficult to avoid dump site health risks when discarding trash.

- ✓ At least 40% of dumps are not fenced off, so that trash scatters and animals roam. Regardless of fencing, 59% of dumps are unstaffed, so that human access is unrestricted.
- ✓ To prevent rodents, foxes, birds, and insects from becoming disease vectors, and to reduce human contact with wastes, recently dumped wastes should be frequently covered with soil. However, likely due to lack of available soil, or an operator to use it, this task is carried out only at about 6% of the dumps.
- ✓ At 25% of the dumps, it is difficult to even unload garbage, and at up to 55 % of dumps, it is generally necessary to walk on top of other garbage to find an unloading spot—an extremely risky activity.



With the lack of SWM services, most rural village households are forced to visit their dumps to discard their trash. Yet visiting the dump is fraught with health risks.



- ✓ In the health study, residents who regularly visit the dump were 2 to 3.7 times more likely to experience faintness, fever, vomiting, stomach pain, ear and eye irritation, headache and numbness.
- ✓ At least 20 percent of villages have had dump site accidents in the past 5 years.
- ✓ In approximately 55% of the villages, bears (often grizzlies) frequent the dump.

Honeybucket disposal is part of the solid waste management health risks in about half of isolated native villages. These villages do not have household running water or sewer facilities. By and large, they use 5-gal buckets lined with plastic bags, and discard their wastes in open, unlined lagoons.

- ✓ 33 percent of these villages have honeybucket disposal sites located adjacent to the dump, and at least 28 percent have a single disposal site for both solid wastes and honeybucket wastes.
- ✓ In at least 30 percent of the villages, honeybucket wastes are discarded at the dump site, or trash is discarded at the honeybucket disposal site, thus increasing exposure of residents and risk of disease transmission between households.



Honeybucket dump, Yukon Delta Region, 2000.

Children and dump salvagers are difficult to keep away from dumps, and they may be at greatest risk, because they are more likely to stay a longer time, come into direct contact with wastes, and venture into dump interiors where walking is more treacherous.



- ✓ Especially in roadless villages in summer months, few open areas exist where children can play. Dumps serve as playgrounds in at least 14% of villages.
- ✓ With the general lack of commercial businesses in villages, dumps often serve as "hardware stores". At approximately 51% of the dumps, people scavenge through unseparated garbage (commonly including animal carcasses, medical waste, honeybucket wastes, and hazardous wastes) to find what they are looking for.

You don't need to visit the dump to suffer ill effects.

- ✓ In the health study, people living closer than one mile to their dump were *19 times* more likely to have eye irritation, and 3 to 4 times more likely to have headaches or faintness.
- ✓ People who were bothered by dump odors or smoke were over 6 times more likely to experience faintness, and over 5 times more likely to have ear irritation.
- ✓ Yet, a full 72% of dumps are within about one mile of homes. At least 30% are within *one-quarter mile* of homes.
- ✓ Because of unrestricted access and proximity to dumps, *pet dogs* often wander through, and then can transfer disease pathogens through interaction with their owners.

**Many village residents have a high exposure to toxic smoke because unseparated wastes are burned at their dump.**

Open burning at village dump, (2000).

- ✓ Dump smoke commonly contains dioxins, carbon monoxide, nitrous oxide, and carbon dioxide. These agents have been associated with respiratory complaints, dizziness, and headaches in the short-term, and cancer and heart disease in the long-term.
- ✓ Burnboxes or dump fires are set often, in up to 73% of the villages.
- ✓ Over 61% of residents in the health study were regularly bothered by dump odors or smoke, during the course of everyday activities.

An even greater threat to resident health may be burning unseparated wastes at home.

- ✓ *To avoid visiting the dump*, residents in at least 66% of villages burn wastes just outside of homes. With no or few roads, homes generally are set very close together in native villages, so that breathing the smoke is unavoidable.
- ✓ People who burned their own trash were *5 to 17 times* more likely to feel faint, and almost *5 to 10 times* more likely to develop numbness, with the risks increasing the more often people burned.
- ✓ Home burners were almost *30 times* more likely than other people to have developed rashes. Other symptoms that were found to be significantly higher include fever, sore throat, and cough.



It is common for hazardous waste drums of antifreeze, motor oil, and other products, to be stored uncovered on the ground, and in easy reach of children.



Motor oil and antifreeze drums stored on school playground.

- ✓ Only 21 percent of villages have any place to store hazardous wastes.
- ✓ In boardwalk villages especially, open space off of the marshy tundra is very limited. It is common for hazardous wastes to be stored on school playgrounds, or next to public washing facilities.

Open dumps contaminate soil and water. Although very little data exists, we know that significant pollution around dump sites occurs throughout rural Alaska, given the available sample test results and the conditions of the vast majority of open dumps.

- ✓ A full 55 percent of villages noted signs of soil and water contamination were present at their dumpsite. At a minimum of 22% of dumps, an oil sheen is visible on standing water at the dump. Used oil from vehicles and machine parts contains a large number of toxic chemicals.
- ✓ Only 20% of villages have hazardous waste disposal programs. With no plan on how or where to discard hazardous wastes they end up in the unlined dumpsites. With nothing to prevent leachate formation or flow, toxic pollutants will migrate away from the dumps. How far they go is dependent on a variety of factors, particularly the characteristics of surface and subsurface water flow through the dump.
- ✓ Over 56 percent of village dumps are seasonally flooded, and/or, standing or running water is often present.



Deteriorated and leaking oil drums at Southeast dump.



Hazardous waste drums and batteries at Southeast dump

The above statistics are alarming because water can carry pollutants downstream to subsistence areas and drinking water sources.

- ✓ For example, after a rain event, lead tested at 5,000 ppb in the Yukon River, just downstream of a creek outlet from a Village dump. That level is 1,000 times the EPA standard for drinking water. Much lower levels of lead are expected outside of high water-events, However, detrimental effects are noted in children after short-term exposure at 10 ppb.
- ✓ Particularly in honeybucket villages, dump site pollutants can include bacteria and viruses. Ingestion can cause gastroenteritis or transmit disease. Skin contact to highly polluted water can cause rashes and delay sore healing. At one Northwest village, bacteria levels at a drinking water intake located some 3,000 yards downstream of a dumpsite were still 4 times over acceptable levels. Several accounts of children developing skin rashes after swimming during high river flow were reported.
- ✓ Without significant water flow, pollutants may only migrate through soil for a few hundred yards (based on limited sampling). But for many native villages, even that distance is cause for serious concern -- 34% of dumps are within about one-quarter mile of a village *drinking water source*.
- ✓ Of great concern, a University of Alaska study found that drinking from "traditional water sources", such as rivers, rainwater, and snowmelt, is widespread in Villages due to complex logistical and socio-cultural, reasons. Given the preponderant location of Villages (along with their dumps) on river systems and Arctic wetland tundras, a significant population of Village residents who use traditional water are *regularly drinking untreated water* that is connected hydrologically to drainage from the dump site of the local village or its upstream neighbor.



River dump upstream from a subsistence fishing camp.



Village in the Yukon Delta Region with honeybucket lagoon and adjacent solid waste dump in foreground.

Poor dump site conditions can often lead residents to use alternative means of waste disposal that can actually increase their health and environmental risks.

- ✓ Besides increased waste burning, resulting disposal practices can include long-term storage of wastes outside of homes, increasing household vector risks.
- ✓ Residents may make use of an out-of-sight river dump or other dump site that is easier to access; thus increasing water contamination risks, and extending the problem of uncontrolled dumping to other areas outside of town. But away from town is where subsistence fish camps and hunting grounds are often located.



In-town garbage storage in Village with unsafe dump access.

Unique in the United States, it is well documented that subsistence activities (fishing and hunting for food) are vital to both native health and culture.

- ✓ Some 80% of village residents rely on subsistence foods at least half of the time.
- ✓ In honeybucket villages, people who ate mostly subsistence foods instead of store-bought foods were *15 times less likely* to experience diarrhea.
- ✓ 63% of villages have two or fewer stores. Due to logistics, these mini-mart sized general stores are costly. Foods are largely limited to junk food, soda pop, and heavily processed food. For many natives then, maintaining a nutritious diet without subsistence foods is too difficult—logistically and/or financially. A switch to store-bought foods has been implicated as a contributory factor in the 150% increase in diabetes rate in Alaska Natives over just one decade.



Fourth of July, 2000 Celebration, Yukon Delta, Alaska.

But the poor condition of the dumps and fears of contamination greatly impact people's subsistence activities.

- ✓ From the health survey, some 64% of village residents have altered their subsistence activities because of the poor condition of their dump.
- ✓ In 45% of villages, hunting or fishing takes place in the vicinity of the dump.



Beyond direct health risks from dietary and active lifestyle changes, poor solid waste conditions might be contributory factors for indirect sociocultural-based health risks.

- ✓ Ethnographic observation, project documentation, and anecdotal information supplied by a number of State, Federal, and Native agency field workers and Village residents, indicate that a number of non-quantified health risks are potentially caused by the poor solid and hazardous waste conditions. When residents are forced to regularly use and see, and often daily smell the nearby uncontrolled, difficult-to-access, putrescent dumping sites, discouragement and frustration are inevitable. Left unaddressed, these responses may in turn contribute to chronic depression.
- ✓ Depression can be a significant causal factor in increased risk for societal illnesses such as alcoholism, drug use, and disrespect of authority. In the universalistic, high-context Alaska Native cultures, societal problems are documented to lead to cultural loss, an often irrevocable effect and one that has been demonstrated in the literature to spiral to ever-increasing societal problems.
- ✓ This connection between healthy communities and solid waste may also work the other way. Several solid waste improvement projects have been observed to lead to increased community pride. Pride in turn increases societal well-being, and thus potentially can contribute to more intact cultures. Many of these projects make use of traditional education and decision-making, a factor that can contribute to supporting culture.



Elder teaching child with trash collection cart in background, Interior.



Southeast Totems at Saxman.

Finally, outside the health risks to humans, dump sites can degrade the environment and harm the wildlife dependent on it.



- ✓ Unmanaged dumps can greatly affect the diversity and richness of the surrounding and downstream plant communities. This transition in turn may affect subsistence berry gathering, and/or animal feeding habits.
- ✓ Without proper dump design, tundra is destroyed, which often leads to generating an ever-increasing area of disturbance that is almost impossible to restore.
- ✓ 34% of villages report bears being killed at their dumps.