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ALASKA VILLAGES CHART THEIR OWN COURSE TOWARD SOLID WASTE SOLUTIONS



7 GENERATIONS
CLEAN UP TRAINING

THE CHALLENGE
OF THE TUNDRA

KEYS TO ENDING
BURNING



IN THIS ISSUE:

☀️ **THE CHALLENGE 2**

☀️ **THE TRIBAL VOICE**

7 Generations Training Empowers People to Clean Up Communities 4

Training Continues After 7 Generation Classes End 6

☀️ **FEATURE: CHALLENGES FOR ALASKA NATIVE VILLAGES**

Alaska Villages Profiled in This Issue 8

Selawik Accepts the Challenge of the Tundra 10

Beyond Barriers: Cleanups Give Villages a Fresh New Look . . 13

Bridges of Power: Leveraging Resources Through Partnerships 15

Collaboration: The Key to Ending Burning? 17

Charting Their Own Course: Kokhanok Village Uses “Real Life” Examples to Teach Kids 19

☀️ **RESOURCES 21**

☀️ **CONTACTS 22**

☀️ **KIDS PAGE 23**



United States Environmental Protection Agency
Solid Waste and Emergency Response (5306W)
www.epa.gov/tribalmsw

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The Challenge

The word “Alaska” conjures images of tundra, rugged terrain, and harsh conditions. This stereotype, however, doesn’t pay tribute to the state’s diversity. Alaska is one-third the size of the continental United States and is divided into five unique climate zones. Alaska Natives are as diverse as the climate and topography of the state, from the Sugpiaq Aleuts of the Alaskan peninsula to the Inupiat, Yup’ik, and Siberian Eskimos of the Bering Sea and Arctic Ocean coasts to the Athabaskan people of the interior to the Tlingits, Haidas, and Tsimshians of the southeast coast.



Although there are hundreds of Alaska Native villages, and each village has a unique culture and history, Alaska Natives are united in their quest for funding, recognition, and social justice.

Raven Sheldon of Selawik village believes, “Everyone is entitled to basic services. The tribes up here are 3, 4, or even 5 years behind tribes in the lower 48 states when it comes to being able to provide basic services for members.” Tribal leaders throughout Alaska are working to secure services that are critical to the health and safety of their people. Proper solid waste management ranks near the top of the list.

Many Alaska Native villages do not have the funding, technical expertise, staff, or equipment required to close open dumps, or ensure safe disposal of solid wastes. Common difficulties associated with solid waste management in Alaska Native villages include:

- Residents import and dispose of manufactured goods that generate plastic, metal, and paper waste.
- A remote location makes shipping (back-hauling) waste difficult and expensive.
- Permitted landfills are more expensive to build and maintain than open dumps.
- Burning waste reduces waste volume, but concentrates toxic materials and produces harmful smoke.

“I want the people who read this issue of the *Tribal Waste Journal* to understand the big picture. I want to open peoples’ eyes and focus more attention on Alaska. Federal agencies should send representatives to visit Alaska villages to gain a better understanding of our situation. Tribes up here are being overlooked.”

—Raven Sheldon, Selawik Village

The villages featured in this issue of the *Tribal Waste Journal* have overcome some of these common obstacles through creativity, persistence, and partnerships. Environmental trainers gave villagers the tools to tap into the leadership and creative potential of the community. Partnerships enabled them to leverage private, state, and federal resources to achieve community goals.



Open dumps such as this are common in rural Alaska, especially in regions dominated by tundra.

Considering Culture and Climate

Villages interviewed are working to implement solid waste management practices that are compatible with the local environment and culture. For thousands of years, Alaska Natives lived subsistence lifestyles, hunting and gathering to survive and producing very little waste. Rosalie Kalistook, environmental planner for the Association of Village Council Presidents explains, “In the past, people did not generate a lot of trash. Any garbage they produced came from the land. They used to bury bones from terrestrial animals under the ground, giving them back to Mother Nature.” The biodegradable nature of the waste stream changed as nomadic tribes assumed a sedentary lifestyle, and Alaska Natives began to consume outside goods. Villages are inundated with plastic, metal, and paper goods and packaging, but most of them do not export waste. This change in lifestyle has created waste management problems that did not exist in the past.

Some Alaska Natives, such as the Athabascans, were traditionally

highly mobile. According to Roy Andrew of Kokhanok, “Between 1955 and 1963, our people gave up the nomadic life style and settled in Kokhanok permanently.” As a result, community members became more dependent on durable goods such as snowmobiles and appliances.

There are five distinct climate zones in Alaska—arctic, interior, west coast, south-central, and maritime (which is further subdivided into western maritime and eastern maritime). Each climate zone has specific temperature and precipitation patterns. These patterns, along with differences in underlying bedrock, produce characteristic soils and vegetation patterns, from grassland tundra in the arctic to temperate rainforest in the southeast. Solid waste management solutions must be compatible with, among other factors, the distinct climate and soils of each village.

Tundra dominates the west coast and arctic regions of Alaska, where a thin layer of soil rests on top of permafrost, a permanently frozen layer of ground. Open dumps and landfills can exert pressure on the permafrost and cause it to melt. As the permafrost melts, the ground

begins to sink. Some villages have discovered disposal options that preserve the tundra, which is not resilient once damaged. For example, Selawik is planning to build above ground disposal areas surrounded by berms and fill them with special storage bags to prevent waste and leachate from disturbing the tundra.

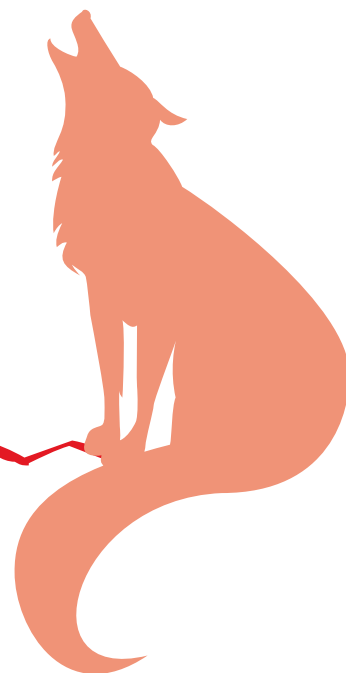
Solid waste management planners for St. Paul Island must take into consideration sandy shorelines in addition to a treeless tundra interior. Residents are working to open a new landfill and close an old one, which is located in a sand dune. Landfill leachate percolates quickly through sandy soils and ocean winds blow plastic bags and other waste onto the tundra.

Unlike Selawik and St. Paul Island, Chilkat Indian Village is located in southeast Alaska on permeable silt soil rather than tundra or sand. While Chilkat’s environmental planner does not need to worry about protecting permafrost, she must consider the impacts of the village landfill on a nearby river. Leachate from the landfill could potentially move through the silt soil into Chilkat River.

“Alaska has five distinct regions with different cultures and climates. You can’t develop a single solid waste management plan for every community in Alaska because each community is unique.”

—Patricia Warren, environmental planner, Chilkat Indian Village

THE TRIBAL VOICE



7 Generations Training Empowers People to Clean Up Communities

Against the vastness and diversity of Alaska, one environmental trainer stands out in the eyes and hearts of Alaska Native villagers: Bill Stokes and his “7 Generations Training.” The TWJ set out to explore how a white engineer from the Alaska Department of Environmental Conservation (ADEC) in Anchorage could illicit such heartfelt praise from so many villagers, many of whom still view white men with suspicion and mistrust and, for years, hated the ADEC for its strict regulatory policies.

Expecting to ask Mr. Stokes how he inspired so many, the trainer turned the interview into a learning session filled with stories, questions, and exercises—much like the ones that the 300 Alaska Native villagers have experienced since the training began in 1997. The following are excerpts of TWJ’s interview with Mr. Stokes, including how the training came about, how it respects village culture and tradition, and how countless Alaska Natives, including elders and children, have been inspired to improve the health and well-being of their communities.

TWJ: What prompted development of the 7 Generations Training?

Mr. Stokes: When I began at ADEC, the standard operating procedure was strict enforcement of regulations. ADEC staff were hated by the villages. I quickly realized that the villages needed technical assistance, not regulation. They needed to know how to manage hazardous waste, used oil, and other wastes. I also saw that villages needed to own the problems and solutions. Compliance by enforcement is dictatorial. Compliance by agreement is understanding. We simply had to explain the hazard and its harm to the villages, and then let them make their own choices and decisions.

TWJ: Since you were an outsider and worked for a regulatory agency, why do you think villagers accepted your advice?

Mr. Stokes: Whenever I visited a village I always made sure to ask the village council for permission. That way, I came to the village as a guest. Once in a village, I watched, listened, and learned. I never told them, “You must do this,” or “You are required to do that.” If I saw a problem, I explained the harm or the hazard. I said, “If this is important to you, and you want to do something about it, I will do everything I can to help you. If not, I will leave.”

At one village I visited, for example, they were burning Styrofoam. I told

the village council that Styrofoam smoke is very toxic, and it’s affecting the whole village. I told them, “It’s your choice whether you do something about this or not. You live here. If it’s important to you, you will find a way to stop.” Six months later, the council banned the burning.

TWJ: Did some villagers ever refuse to change?

Mr. Stokes: I was in a village above the Arctic Circle. They were furious because they felt they were being done in by the white man. I listened for awhile. Then, I took the council to one of their dumps, filled with refrigerators, Freon, and other household materials. I told them, “You can’t yell at someone else for

polluting your environment when, in fact, you're doing it yourself." It's interesting to see their reaction. I watch their eyes—the view ports of their hearts—see how the village's contribution adds to the problem.

TWJ: There are so many Alaska Native villages. How did you visit all of them?

Mr. Stokes: By 1997, I had conducted more than 20 village environmental assessments, and the requests from the villages far outstripped my ability to do them. At this point, I realized that I needed an environmental toolbox that allowed me to train the villages to conduct their own environmental assessments and educate themselves. It was at this point that I began developing a rough draft of what Sue Unger finalized as *7 Generations: Addressing Village Environmental Issues for the Future Generations of Rural Alaska*.

TWJ: How do the environmental tools you developed work?

Mr. Stokes: The first part of the 7 Generations training is the environmental planning survey, and the second is the technical environmental survey. The planning survey is used to help a community identify issues and build a consensus on priorities. When you survey 100 percent of a community, the community members have essentially voted on the issue. Tribal council meetings can be a lot like dog fights. There's a lot of internal politics. The survey takes the politics out of these decisions because the community speaks and says, "We want this fixed." The survey also helps create ownership over the issue and empowers villagers to solve the problem themselves.

The technical environmental survey helps villagers know the right questions to ask so that they can check the viability of a facility. For exam-

ple, someone who knows nothing about a water system, but knows the right questions to ask, can get a good idea of how well the system is working and whether or not the operator is doing a good job by using this tool. It tells you all the questions you need to ask to get a thorough assessment of village environmental facilities.

TWJ: We understand your training program will cease to exist as of July 30, 2003. How do you feel about this decision?

Mr. Stokes: We're finding that communities now come to the ADEC and say "These are our issues, how can you help us fix them?" not "Can you fix them for us?" This is a huge change from 10 years ago. More importantly, we have trained more than 300 people and addressed more than 10,000 school children. These are the people who will keep 7 Generations alive.

TRAINING EXERCISES TOUCH THE HEART

Bill Stokes understands that change occurs when people are moved by their hearts, not their minds. "Our culture and values live in our hearts," he says. So, he starts his training with the premise that pollution has a "real world" impact on people's value systems. A variety of techniques, including exercises, stories, and questions allow villagers to experience this principle first in their hearts and their own lives. He then offers them environmental tools that they can use to improve village life as a whole.

Exercise 1. Participants start by listing four of their values in one column, and four pollutants in their lives in another. "In many cases," Mr. Stokes explains, "this may be the first time that a villager sees how their value of cultural preservation could be impacted by a pollutant in their life, such as alcoholism." He says many elders have even cried when they saw how the pollutants in their lives are impacting their values. Since people have some control over their values, Mr. Stokes believes participants then become more willing to own both the problem and the solution.

Next, the training moves to the community as a whole so villagers understand how their choices and actions can contribute to pollution of their entire village. Again, he brings the ideas of ownership and responsibility back to their own lives. "During all of my training sessions, I always tell participants to look out the window, and I ask them, "What do you see in the village that you don't like?" The stuff in the dump doesn't grow there, we put it there." Then he tells them, "If you don't fix it, your grandchildren will have to live with it."

Exercise 2. To help empower villagers to see beyond their problems and begin to look for ways they can improve the situation, Mr. Stokes uses another simple exercise. In column A, participants list four main environmental problems in their community. In Column B, they list three solutions to each of these problems. In this way, Mr. Stokes explains, "Villagers not only make the issue theirs, but also the solutions." He encourages participants to start by making changes in their own house before they tackle more complicated environmental problems.



Training Continues After 7 Generations Classes End

Bill Stokes' 7 Generations training workshops have recently been phased out, but a cadre of enthusiastic students are now assuming the teaching responsibility for their villages, providing them with the knowledge and tools required to prioritize and tackle serious environmental problems. The village environmental planners we interviewed are combining the tools from the 7 Generations training with field experience, local traditions, and other training to create successful education and outreach programs. The following is a summary of their activities.

Inspired by Mr. Stokes' training, Roy Andrew, president of the Kokhanok Village Council, returned to his village and created an environmental survey to assess community priorities and build support for his village's solid waste management program. He invited every adult to participate in the decision-making process by answering questions such as:

- How do you rate the importance of different solid waste programs?
- Is it important to start teaching school students about environmental issues?
- How should Kokhanok Village Council inform you of environmental issues within the village?

Mr. Andrew supplemented survey results with his own observations about the community to develop an environmental plan. For example, he noticed that a comprehensive village cleanup in 2001 produced mixed emotional reactions. After the event, a sense of sadness and gloom pervaded the community. Some of the elders felt that discarding abandoned items that had been part of the village for more than 40 years removed part of its identity. At the same time, villagers experienced joy and felt cleansed, physically and spiritually. Based on

observations like this one, Mr. Andrew decided to draft an environmental plan that respects Kokhanok traditions, incorporates aspects of local culture, and addresses the concerns raised by community members in the environmental survey.

Patricia Warren of Chilkat Indian Village found that village-oriented leadership experiences and courses on solid waste management issues

helped her assume a greater environmental leadership role, while strengthening her village's solid waste management programs. As an Americorps volunteer in the village, Ms. Warren developed leadership skills that allowed her to build community support for a recycling program. She enlisted local students to paint a new recycling center and educate the community about it.

Impressed with her enthusiasm and skills, the tribal council advanced her into a new position—environmental planner. In her new role, Ms. Warren obtained technical expertise on solid waste management plans by attending the University of Northern Arizona's Institute of Tribal Environmental Professionals Solid Waste Management course. After working with a consultant to draft a solid waste management plan for Chilkat Indian Village, she enrolled in a University of Alaska environmental technology course and revised the plan with her professor's assistance. Likewise, Carole Holley of Galena Village used the leadership skills and technical expertise she obtained through similar courses and field experience to create a successful education and outreach program in her community. According to Ms. Holley, "The best way to get people to participate in cleanups is to use every possible method for informa-

TRAINING TIPS FROM TRIBES

Look for workshops and courses that:

- Provide planning tools for small communities.
- Demonstrate how to involve village residents.
- Present funding opportunities and explain grant requirements.
- Facilitate networking with representatives from funding agencies and other villages.
- Foster the technical expertise required to tackle environmental issues in rural Alaska.

GRANT WRITING ASSISTANCE: JUST A PHONE CALL AWAY

When an environmental planner in Tuluksak, Alaska, needs help writing a grant, she contacts the Association of Village Council Presidents (AVCP). AVCP is one of 12 nonprofit organizations managed by the various tribes of Alaska—each organization serves villages in a specific region. AVCP provides social services and technical assistance to the 56 federally recognized tribes of the Yukon Kuskokwim Delta, directing villagers with environmental concerns to Rosalie Kalistook, a woman with answers.



One of AVCP's tasks is to help villages build solid waste management programs from scratch by providing grant-writing assistance. At first glance, grant applications can be daunting. Experienced grant writers are rare in Alaska Native villages, and more than half of the Yukon Kuskokwim Delta tribes have never received funding for environmental projects. Ms. Kalistook is working to change this statistic.

Before joining AVCP's staff, Ms. Kalistook wrote solid waste management grants for her own village. She relates to villagers struggling with applications. When these individuals call for advice, Ms. Kalistook explains the requirements and sends samples of completed grant applications. AVCP urges villages to develop long-term plans and sustainable programs to increase their chances of receiving funding.

AVCP encourages villages to network and share information on funding opportunities and environmental programs. Ms. Kalistook organizes an annual conference, for example, enabling villagers to discuss traditional environmental practices and share solid waste management success stories. In 2003, she invited a tribal administrator, a tribal council member, an elder, and a student from each village of the Yukon Kuskokwim Delta.

tion dispersal, including standing outside with a sign." Ms. Holley uses posters and the public radio channel to broadcast information about cleanup events. Prizes provide additional incentive for residents to dispose of household hazardous waste and used oil properly. Ms. Holley writes articles for the tribal newsletter to keep the community informed of her department's activities. She also started a recycling club to educate students about proper solid waste management. If Ms. Holley left Galena tomorrow, her programs would continue to flourish because the community supports them.

Ann Wyatt and Paula Peterson, environmental planners on Prince of Wales Island, attended a grant management training in Anchorage after receiving Indian General

Assistance Program (IGAP) funding from EPA. According to Ms. Peterson, "One of our greatest challenges was learning how to meet EPA's requirements after we received IGAP funding." The training helped both women submit progress reports on time and use the grants properly, making them strong candidates for future funding. The IGAP grant management training also offers environmental planners an opportunity to meet individuals from other villages, discuss common problems, and learn from one another. The Alaska Native Health Board and other organizations sponsor conferences that offer similar networking opportunities.

Training and education can also be used to build human capital within a village and create momentum for

solid waste management programs. When Jeanette Carlson organized a cleanup in Chignik Bay, she hired workers from a pool of residents certified to handle hazardous materials. In 2002, these individuals received HAZWOPER (hazardous waste operations and emergency response) training and learned about the Occupational Health & Safety Administration's requirements for handling hazardous waste. The training proved to be an asset—with properly trained community members, Ms. Carlson did not need to hire an outside contractor to perform the cleanup.



ALASKA VILLAGES PROFILED IN THIS ISSUE



SELAWIK

Selawik is an Iñupiat Eskimo community active in traditional subsistence fishing and hunting. The village is home to 792 tribal members and less than a dozen non-tribal members. During the summer, many residents move to subsistence camps near the village, and move back to town for the winter. Because of its location on the tundra 10 miles above the Arctic Circle, the village uses a system of boardwalks rather than roads.

GALENA (LOUDEN)

The Native Village of Galena, also known as Louden, is located on the Yukon River. Louden was a semi-permanent summer fishing camp established by nomadic Koyukon Athabascans. In 1918, lead miners established Galena 14 miles down-river from Louden, and Athabascans living in Louden began moving to Galena. As a result, the Native Village of Galena is also known as Louden Village. Not connected to the state road system, the village relies on planes landing at Galena Air Field and barge service for supplies.

ST. PAUL ISLAND

Located north of the Aleutian Islands approximately 300 miles from the mainland, St. Paul Island is the largest of the five Pribilof Islands. This 14-mile long by 8-mile wide island of treeless tundra and sandy shorelines is home to more than 500 people. Russian fur traders were the first outsiders to reach St. Paul, but fishing eventually replaced fur trading as the main occupation on the island. Thanks to U.S. government investment in running water, sewer, roads, and other conveniences, St. Paul is one of the most modern villages in Alaska.

VILLAGE OF CHIGNIK BAY

Chignik Bay, accessible only by sea and air, has a winter population of less than 100. During the spring and summer when the local salmon canneries reopen, the population multiplies 10-fold. Built in the late 1800s, the local cannery attracts workers from all over the world, making Chignik Bay a melting pot of different cultures. The name Chignik is an Aleut word meaning "great wind" and legend has it that storms are born in Chignik.



FEATURE: CHALLENGES FOR ALASKA NATIVE VILLAGES

KOKHANOK

Kokhanok Village lies on the shores of Lake Iliamna, the largest fresh-water lake in Alaska and a major spawning ground for sockeye salmon. This village of approximately 170 people, became a permanent settlement in 1959. Prior to this time, families moved continually, fishing, hunting, and trapping game for subsistence.

CHILKAT INDIAN VILLAGE (CHILKAT VILLAGE OF KLUKWAN)

Chilkat Indian Village, also known as the Chilkat Village of Klukwan, is located on the Alaska Chilkat Bald Eagle Preserve. Home to approximately 150 people, the village lies in the Chilkat River valley and is attached to the Alaska road system. All five species of Pacific Salmon run up the Chilkat River and are a valued resource. Unlike many tribes in Alaska, Chilkat Indian Nation owns the land in the village.

KLAWOCK COOPERATIVE ASSOCIATION

The four tribal villages of Klawock (pop. 673), Kasaan (pop. 54), Hydaburg (pop. 369), and Craig (pop. 1,500) make up the Klawock Cooperative Association. The villages are located on Prince of Wales Island, the third largest island in the United States. The island's mill and cannery provide the majority of jobs on the island. Islanders communicate with the rest of the world via satellite telephone and mail.



Selawik Accepts the Challenge of the Tundra

Like many Alaska Native villages, Selawik has more than its share of solid waste management challenges. Located 10 miles above the Arctic Circle on the banks of the Selawik River, geographic isolation, extreme temperatures and winds, and the melting and freezing of the tundra makes road-building and trench-digging difficult or impossible. With perseverance, patience, and ingenuity, however, Selawik faced these issues head-on and developed an integrated solid waste management program to solve its number one problem: an uncontrolled open dump.



The entrance of Selawik's dump stands a mere 1,500 feet from the edge of the village.

Selawik's current dump is little more than an unlined, unfenced open area whose boundary continues to creep closer and closer to the village. Today, the dump's entrance stands a mere 1,500 feet from the edge of the village. Joe Sarcone of EPA Region 10 describes Selawik's dump as "one of the worst I have seen." Raven Sheldon of the Selawik environmental program agrees. "Our community hates visiting our existing dump site . . . and everybody knows it is too close to town. All you have to do is look out the back window of our medical clinic or last row of houses to see it or smell it."

Adding to the concern about the dump, a recent epidemiological study of the villagers revealed that simply visiting the dump greatly increased the risk of illness. Villagers have also noted that pollution from the dump, such as blown litter, smoke, and leachate, negatively impacts subsistence practices. Many villagers, for example, will not fish in certain parts of the river because of leachate contamination.

"I hope that other tribes can benefit from our experience with designing a new type of landfill. Many villages in Alaska face similar obstacles. We can help tribes overcome them. We want to create a step-by-step guide to help tribes build a landfill like ours."

— Raven Sheldon, Selawik Environmental Program

From Dump to Landfill

Through the process of developing a long-term solid waste management plan (made possible through a 1999 EPA grant), the community determined that the central component to solving the problem of the dump would be constructing a state permitted landfill.

Selawik's first challenge was obtaining a Class III permit from the Alaska Department of Environmental Conservation (DEC). Alaska DEC returned

Selawik's first landfill permit application with a series of questions concerning the proposed facility's impact the tundra. In response, Selawik reassessed its landfill design and selected a new, innovative technology that is "the newest trend in Alaska," according to Mr. Sheldon.

Recommended by an engineering consultant who initially was provided through the Central Council of Tlingit-Haida Indian Tribes of Alaska, "Super Sacks" became the answer to Selawik's landfill challenges. Super Sacks are large bulk shipping bags—the average size is 3 feet square and 4 to 5 feet tall—made from woven polypropylene (plastic). They weigh only about 5 pounds when empty, but are designed to hold loads from 1,500 to 4,000 pounds.

The plan is to fill the Super Sacks with non-combustible waste and burn box ash residue and then place the full bags into a disposal area surrounded with berms above the tundra. Selawik decided to use this above-ground design to avoid damaging the tundra. Once built, the new landfill will operate for at least 20 years, according to Mr. Sheldon.

The new landfill will be connected to the village by a new gravel road, compliments of the Alaska Department of Transportation (DOT) and other sources. At the suggestion of EPA's Joe Sarcone, Selawik contacted DOT to inquire about funding for a road. DOT was very receptive and sent representatives to Selawik for a site visit. After seeing the condition of the village's open dump, DOT committed funds to build the road.

To prevent the new landfill from becoming another open dump, the village plans to limit public access to the posted hours of operation when facility staff are on site. In addition, villagers can only drop off waste at the facility transfer station or the salvage pad (see next section for more details), not the burn box or landfill itself.

A Comprehensive Facility

Because its solid waste management plan called for the construction of a comprehensive new waste handling and disposal facility, Selawik began work on two other important elements of the facility (in addition to the landfill)—a facility transfer station, and a burn box—even while the landfill project was being reviewed and redesigned.

Facility Transfer Station:

The facility transfer station is where villagers will drop off certain types of waste and reusable or recyclable items that the mini-transfer stations (described on page 12) cannot handle. Design plans include:

- Separate bins for waste and recyclables, as well as a series of large, covered totes (“fish totes”) for subsistence wastes, lead-acid batteries, containerized used oil, and other hazardous wastes.
- A salvage pad and prefabricated shed for storing reusable or recyclable items including vehicles, vehicle parts (including tires), equipment and appliances, furniture, toys, construction materials, and safely-contained hazardous materials such as paints. Reusable items will be resold with all proceeds going back into the solid waste management program account, and non-reusable items will be recycled.

Burn Box: Selawik's solid waste management plan includes the use of a burn box to reduce the volume

of waste and destroy wastes that attract insects, birds, bears, dogs, and other vermin and scavengers. To ensure worker and village safety and meet the state opacity requirements, burn box operators will sort waste prior to burning and regulate the waste's moisture content according to the village's strict burn box operating procedures outlined in its Solid Waste Operations and Maintenance Plan.

Short Term Solutions with Long-Term Benefits

While waiting for the landfill permit and funding, the community continued with several complementary endeavors to support both its short-term needs and long-term goals. “We had some setbacks in the last few years . . . but we decided we had to upgrade our existing site to at least reduce the most severe risks to our community health and the environment,” Mr. Sheldon explains.



Selawik's open dump during the summer. Note the remains of the containing fence destroyed by the wind.



The village's original open dump on the bank of the Selawik River.

To this end, the village used its first Open Dump Cleanup Grant funding of \$250,000 to: 1) purchase a bulldozer to improve conditions at the existing dump, 2) implement a waste collection program and design mini-transfer stations, 3) begin a recycling program, and 4) buy a used oil burner.

Bulldozer: The community purchased a new bulldozer to close portions of the current dump site. The bulldozer is used to push waste back from the edge of the boardwalk, and compact and cover it with gravel. At the new landfill, the bulldozer will be used to push waste into the burn box and load ash into the Super Sacks.

Waste Collection and Mini-Transfer Stations: Selawik and Alaska DEC officials both agree that an effective waste collection system is needed to ensure the success of the new landfill facility. Such a system makes it unnecessary for villagers to visit the facility, except to drop off large items or large volumes of subsistence waste. This procedure allows landfill operators to control dumping and manage the facility.

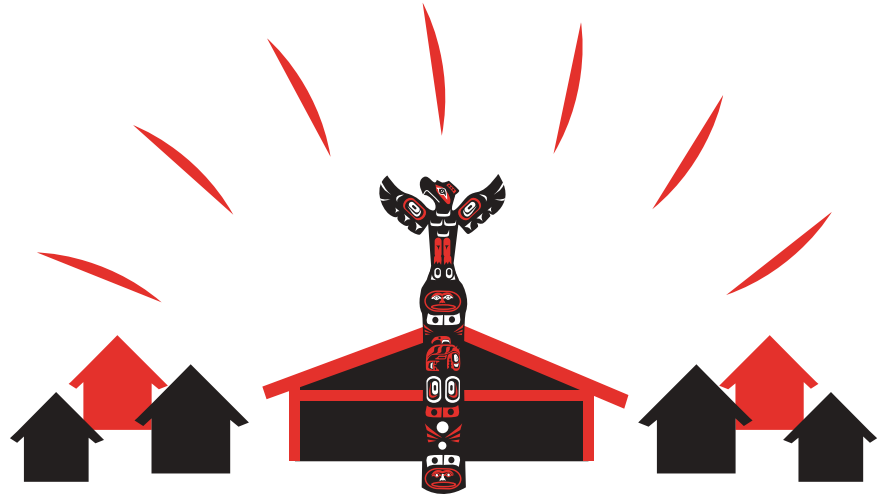
Because full door-to-door waste collection service is too expensive (Selawik currently provides a limited door-to-door service for village elders and others requiring special assistance), Selawik is planning to build five mini-transfer stations within the village. The sites will consist of waste bins on 3-foot deep pads of gravel and insulation to protect the tundra. To empty the bins, the village will purchase a Bobcat forklift—the only machine small enough to fit on the 6-foot wide boardwalk. Once the new landfill is operational, the Bobcat also will be used to move and stack filled Super Sacks.

Recycling: Selawik purchased shipping containers to store and ship aluminum cans, lead-acid batteries, non-reusable computers, and other recyclable household hazardous wastes. Since Selawik is only serviced by barge once or twice each summer, the village purchased a second container to continue storing recyclables while the first container is barged down river. Materials are barged to Anchorage where they are either recycled or shipped to Seattle for processing.

Used Oil Burner: Buying a used oil burner solved two of Selawik's problems: 1) safe disposal of the large amount of used oil generated by ATVs, snow machines, and other heavy equipment, and 2) heating the storage shed that protects the new bulldozer and other mechanical equipment from the extreme arctic temperatures.

Though all the pieces of its solid waste management plan are not yet in place and much work remains, Selawik has shown that desire and determination, coupled with significant community and outside assistance, can help create solid waste solutions for small, remote Arctic villages.

Beyond Barriers: Cleanups Give Villages a Fresh New Look



For decades, the debris piled up along roads and near homes in Kokhanok Village. Like many other villages, the snow machines, appliances, storage drums, tires, batteries, and other debris left Kokhanok in need of a makeover. But in 2001, a comprehensive cleanup gave the community a fresh new look.

From funding to tribal council approval, and from “junkoholics” to the weather, the obstacles faced by Alaska Native villages planning cleanups vary widely. Thanks to new funding rules, trained environmental managers and workers, and community support, villages such as Kokhanok are overcoming these barriers and achieving results.

Several of the villages we spoke with cited funding as the key obstacle to cleanup success. During an Indian General Assistance Program (IGAP) training session in 2000, one villager dumped a waste basket onto the floor and said, “You can look at it. You can talk about it. You can even write a plan on how to pick it up. But you can’t pick it up!” At the time, Alaska Native villages could not use IGAP funds to implement environmental programs. They hired and trained environmental staff, planned cleanup projects . . . and waited. In 2001, EPA amended the IGAP funding restrictions, allowing many villages to move forward with cleanups. Some villages, however, lack IGAP grants, and even grantees face additional challenges.

Village of Chignik Bay

Jeanette Carlson, environmental coordinator for the village of Chignik Bay, took advantage of EPA’s new funding rules and included a cleanup in her 2002 IGAP work plan. She organized several meetings with the tribal and city councils to obtain support for her project, which addressed abandoned vehicles, storage drums, batteries, and debris from an old open dump.

Chignik Bay is only accessible by air and sea, so the tribal council hired a barge company to haul debris from the community to a landfill in Kodiak. The city council supplied heavy equipment, such as bulldoz-

CLEANUP TIPS FROM TRIBES

- Meet with tribal and city leaders to obtain project support.
- Locate an adequate supply of workers qualified to handle hazardous waste.
- Allow extra time to gather items that will be hauled out.
- Expect pockets of resistance, particularly from “junkoholics.”
- Plan for weather-related delays.
- Identify hidden costs such as tipping fees at the landfill.

ers, to move items from the village, but did not provide staff to operate the machinery and remove hazardous materials such as antifreeze from old cars. In the past, Ms. Carlson used IGAP funding to offer hazardous waste operations and emergency response (HAZWOPER) training to community members. Therefore, she was able to locate three qualified residents to complete the job.

It took longer than Ms. Carlson expected for the HAZWOPER workers to move all of the debris to the dock, and mother nature interrupted operations. Sub-zero temperatures made it difficult to drain fluids from vehicles. Most commu-

nity members supported the cleanup effort, reporting old vehicles or other litter to the HAZWOPER team. One man, however, resisted because he was attached to the items lying on his property.

Despite minor obstacles, the cleanup was successful and community members applauded the results. The HAZWOPER workers collected more than 60 old propane tanks, four totes of lead-acid batteries, and 34 abandoned vehicles. To keep the village clean, the tribal and city councils passed a joint resolution to enforce a no dumping or littering ordinance in subsistence and recreational areas.

Galena (Louden) Village

Carole Holley, environmental program director for the Loudon Tribal Council, also organized an ambitious junk car removal project, supplementing IGAP funding with free services. She contacted Captain Moore of Yutana Barge Lines and asked him to haul the cars from her community to Nenana for free. Captain Moore's barge company was involved in an illegal dumping lawsuit in the late 1990s and agreed to provide free back-hauling services for villages as part of the settlement. Captain Moore committed to the junk car removal project immediate-

ly. Ms. Holley also called a railroad company at his suggestion, which offered to move the cars from Nenana to Anchorage for free.

After securing barge and train service for the project, Ms. Holley searched for people to move the cars from the village to the barge. She approached the city council, which offered to provide workers. Nearby villages also expressed interest in participating and promised to deliver cars to the barge. Unfortunately, these villages were unable to find volunteers to move the cars and lacked funding to hire workers. Despite a disappointing turnout from surrounding communities, more than 40 junk cars were removed from Galena and the project was considered successful. When Ms. Holley organizes another cleanup event, she plans to help neighboring villages obtain IGAP funding for it.

Kokhanok Village

While the village of Chignik Bay and Loudon Village relied on IGAP funding and free services to complete cleanup projects, Kokhanok Village used an Alaska Native Health Board (ANHB) solid waste management grant. Kokhanok hired 20 residents to move 50 truckloads of broken appliances, cars, snow machines, and other items from the village to the dump. During the cleanup, workers built storage boxes for batteries; burned waste oil; and collected pipes, wires, and drums at central locations. School children contributed to



Abandoned vehicles waiting for the barge in Chignik Bay.

the effort by cleaning up litter around the village.

At first the cleanup project in Kokhanok produced mixed emotions. Some of the elders felt that the abandoned items were extensions of themselves and resisted the cleanup, but they were impressed with the results—they felt cleansed.

St. Paul Island

Like Kokhanok Village, St. Paul Island located funding to supplement its IGAP grant. At one time, the residents of St. Paul Island used 55-gallon oil drums as garbage cans. Frequently, the open drums blew over, allowing foxes, seagulls, and stray cats to strew waste throughout the village. The Alaska Intertribal Council provided St. Paul Island with money to build sturdy, wooden containers and replace the drums. After completing the new containers, environmental planners used community cleanups to give the island a makeover.

In addition to cleaning up municipal solid waste, St. Paul Island tackled a marine debris problem. Each year, tons of derelict fishing gear wash up on the island's shores, littering beaches and trapping local wildlife. In 2003, workers gathered 25,000 pounds of marine debris and shipped it to a mainland landfill.



Kokhanok's HAZWOPER team removes batteries and other hazardous materials.

Bridges of Power: Leveraging Resources Through Partnerships

Known for their carving skills, the Tlingit and Haida of Southeast Alaska create beautiful totem poles. Their carvings appear similar at first glance. Tlingit figures are isolated from each other while Haida figures interconnect and overlap. Like the Haida figures, these villages are forming connections with other villages, businesses, and governments. Many Alaska Native villages recognize that some partnerships can produce benefits.

While environmental planners on Prince of Wales Island answer to different tribal councils, they believe that partnerships are a source of support and call each other frequently to share ideas. In addition to providing inspiration, partnerships helped the villages we interviewed access funding, free labor, and technical assistance. From creating local alliances to building relationships with federal officials, these villages are reaching out and reaping rewards.

Local Alliances

In most Alaska Native villages, two distinct governing bodies—the tribal council and the city council—determine the fate of the community. Tribal and city councils can work synergistically to plan, fund, and staff solid waste programs. For example, the tribal and city councils of St. Paul Island are working to create a sustainable recycling program. The tribe won grants for storage containers, balers, and other recycling equipment and would like the city to provide funding to collect materials and maintain the equipment.

In Galena Village, city employees collect waste from residents and staff a landfill, but the Loudon Tribal Council is responsible for environmental protection. Carole Holley, environmental

planner for the Loudon Tribal Council, cultivated a relationship with the facilities manager for the city. As a result, the tribal and city councils are working to integrate environmental protection into solid waste management. The two governing bodies don't always agree, but open communication enables them to sort through differences and reach consensus.

In addition to reaching out to the city council, tribal environmental planners can build relationships with individual villagers and ask them to volunteer expertise or time to solid waste management programs. When Patricia Warren, of Chilkat Indian Village, decided to establish a recycling center in an old firehouse, student volunteers provided free labor for the project.



The students helped paint the building and set up containers for recyclable materials. Villages on Prince of Wales Island rely on volunteers to assist with cleanup events.

Tribal environmental planners can also cultivate local alliances by educating the community about their programs. Patricia Warren is proof that this strategy works—she became so excited about environmental issues that she decided to serve her village as an Americorps volunteer. Each year, the Rural Alaska Community Action Program uses a grant from Americorps to hire 25 individuals from Alaska Native

villages to serve their own communities. During her year of service, Ms. Warren established a recycling program and beautified Chilkat Indian Village. After completing these projects, the tribal council hired her as an environmental planner.

Beyond Village Borders

Paula Peterson, environmental planner for the Organized Village of Kasaan, believes that partnerships with other villages can supplement local expertise and resources. Prince of Wales Island is home to four tribal communities—Klawock, Hydaburg, Craig, and Kasaan. In 2000, these villages formed the Prince of Wales Tribal

Environmental Coalition to coordinate efforts between their EPA-funded environmental departments. In an early victory, the coalition convinced the Alaska Inter-Tribal Council to reverse a decision to exclude Kasaan from an Integrated Solid Waste Systems Project Grant. Originally, the council awarded funding to Klawock, Hydaburg, and Craig, but not Kasaan. According to Ms. Peterson, “Representatives from Klawock, Hydaburg, and Craig realized that their own villages would receive less funding if the Alaska Inter-Tribal Council provided fund-

ing to Kasaan, but they didn’t want to leave any Native village behind.”

Residents of Galena, Koyukuk, Huslia, Ruby, Kaltag, and Nulato understand the benefits of working together. These villages comprise the Yukon-Koyukuk Environmental Consortium. Carole Holley works for the Louden Tribal Council in Galena but helps all of the villages draft IGAP grant work plans and apply for additional grants. In the future, she would like members to pool their resources and ship waste out of the region.



Kasaan TEC

Private Partnerships Pay Off

Several of the villages we interviewed convinced businesses to donate goods or services by reminding them

that benevolent activities can boost corporate image and attract new customers. When the Prince of Wales Tribal Environmental Coalition organized an Earth Day fair, local businesses agreed to donate gifts and prizes for students.

When Carole Holley organized the junk car cleanup for Yukon-Koyukuk Environmental Consortium villages, she asked Captain Moore of Yutana Barge Lines to provide free hauling service from Galena to Nenana. Captain Moore agreed and suggested that Ms. Holley call the Alaska Railroad Corporation and ask them

to transport the cars from Nenana to Anchorage. According to Ms. Holley, “We told the railroad service that Yutana was back-hauling the cars for free and the company agreed to help out. In the end, we removed between 40 and 50 cars from the villages!”

“Reach out to other tribes. Usually, they are willing to help you, but they need to know you need help.”

—Paula Peterson,
environmental planner,
Organized Village of Kasaan

If they have extra space, some barge services and airlines will backhaul waste or recyclable materials for free. Alaskans for Litter Prevention and Recycling (ALPAR) established a “Flying Cans” program that matches villages with airlines that volunteer to transport aluminum cans to Anchorage. Galena participates in this program.

Cashing in on Government Connections

Raven Sheldon of Selawik advises villages to build a network of government contacts by approaching state and federal officials at training sessions and conferences. Villages can demonstrate that they are committed to pursuing solutions by keeping in touch with these individuals. Networking paid off for Selawik. Mr. Sheldon cultivated a relationship with Joe Sarcone of EPA, who eventually helped Selawik obtain funding from many sources.

Chignik Bay’s environmental coordinator, Jeanette Carlson, maintained contact with EPA that helped keep her informed of changes in IGAP funding. When tribes became eligible to use IGAP funds for project implementation, Ms. Carlson’s EPA contact let her know immediately, and Chignik Bay diverted money to a cleanup project.



Entrance to the Klawock Transfer Station.

Collaboration: The Key to Ending Burning?

“I refuse to accept that burning waste is the only option for managing waste in Alaska Native villages,” declares Carole Holley, environmental program director for the Loudon Tribal Council. “Alaska Native villagers rely on the land for subsistence, and burning waste threatens this way of life,” she explains.

Instead, Ms. Holley proposes creating a regional consortium of tribes to coordinate the back-hauling of all waste from Alaska Native villages and is working with a contractor on a feasibility study for this plan. Through such consortiums, she sees a viable way for the tribes to achieve regional waste management goals while maintaining their sovereignty.

Recognizing it will not be easy to eliminate burning, Ms. Holley is counting on cooperation and partnerships to make back-hauling waste possible. “I really think that by working with neighboring villages, the Alaska Department of Environmental Conservation (DEC), and federal agencies that Alaska Native villages can find a solution to this problem,” says Ms. Holley.

To date, Ms. Holley, representing the Yukon-Koyukuk Environmental Consortium, has successfully negotiated one such agreement with Captain Moore of Yutana Barge Lines. Under this agreement, Captain Moore back-hauls junk cars, snow machines, old boats, refrigerators, and other large items collected from Galena and five neighboring villages once a year.

Expanding this program requires funding, but that is hard to come by, says Ms. Holley. Without it, she explains, “we have to rely on companies and individuals to sympathize with our situation and donate services.”



Galena Village

In the meantime, Ms. Holley is educating leaders in the Loudon Tribal and Galena City Councils about the harmful effects of burning wastes. She is concerned that her village and other villages are deciding to burn without fully understanding its impacts upon their health and welfare. This problem is exacerbated, she asserts, “by government-sponsored grant programs that offer villages grants to purchase burn boxes and provide technical assistance to help them burn.”

Bill Stokes of the Alaska DEC’s Rural Issues Program, understands Ms. Holley’s concern. He believes that controlled burning of waste is a viable and effective volume reduction approach, but he cautions: “It is not free.” When he visits a village that is currently burning its waste or considering this approach, he explains that burning waste creates and emits dioxins and numerous other dangerous pollutants, but lets them decide

what to do about it.

Patricia Warren, environmental planner for Chilkat Indian Village, elaborates about the decision Alaska Native villagers face: “If we do not burn our waste, dogs, bears, foxes, flies, rats, and other animals get into it and carry diseases to the village. We have to choose between the lesser of two evils—dioxin emissions or disease carrying vermin.”



Chilkat Indian Village

When educating Loudon Tribal officials about burning, Ms. Holley used an informational approach. She pointed out the link between burning trash and the emissions of the group of toxic chemicals known as persistent organic pollutants (POPs). Previously, tribal council and other village leaders expressed concern about POPs in a letter they wrote to support the Kyoto Protocol. POPs, also referred to as persistent, bioaccumulative, and toxic pollutants (PBTs), are highly toxic chemicals that do not break down in the environment.

By tying her message about the harmful impacts of burning waste to POPs, climate change, and the

THE HAZARDS OF BURNING

The smoke from burning waste (referred to as open or backyard burning) is more than just an irritating nuisance. It also contains many harmful pollutants, including particulate matter, sulfur dioxide, lead, mercury, hexachlorobenzene, and dioxins. These pollutants can cause immediate and long-term damage to the lungs, nervous system, kidneys, or liver. Children, the elderly, and those with preexisting respiratory conditions are often affected the most.

Dioxins are some of the most toxic chemicals produced by open burning of household waste. They accumulate in the food chain, are toxic at extremely low levels, and are linked to several health problems, including cancer and developmental and reproductive disorders.

For more information on the health and environmental hazards of burning waste, including dioxins, visit EPA's Backyard Burning Web site at www.epa.gov/msw/backyard/.

Adapted from EPA's *Tribal Leaders Are Key to Reducing Backyard Burning* (EPA530-F-03-016).



Kyoto Protocol, Ms. Holley believes she's helping people "understand how burning fits into the big picture." So far, she's found many people receptive to the information because they want their communities clean.

The city council, however, has been more difficult to convince, says Ms. Holley. Currently, the city burns household waste in piles at its Class III permitted landfill and burns medical waste behind the clinic, which is located next to the public school. Ms. Holley believes she has made some progress in reaching city officials. While the city believes it needs to continue burning waste to reduce the volume of trash, certain materials, such as plastics, are being separated and not burned. The city has told Ms. Holley that it will continue to burn waste until she comes up with a better solution.

As a first step towards finding that solution, the Loudon Tribal Council Environmental Program is building a waste transfer station. In 2001, the village received grants from the Alaska Native Health Board, the Interagency Working Group Tribal Open Dump Cleanup Program, and the Alaska Inter-Tribal Council Integrated Solid Waste Systems Project to plan, build, and equip a transfer station. The transfer station will house recycling operations and a new compacting dumpster. The compacting dumpster reduces the volume of waste and alleviates some of the need for burning waste at the landfill. It will also play a crucial role in future waste back-hauling by compacting waste to facilitate handling and shipping.

Separating recyclables from waste further reduces the amount of waste destined for burning and the landfill or needing to be back-hauled. Arranging transport and finding end users for recyclables can be challenging, but it should prove easier than arranging for waste back-hauling and less costly than paying for disposal.

The village currently recycles its aluminum cans through ALPAR's (Alaskans for Litter Prevention and Recycling's) Flying Cans program, a statewide back-hauling program. Ms. Holley is investigating ways to expand the village's recycling efforts beyond aluminum cans. She has particularly high hopes for recycling corrugated cardboard, which comprises nearly 60 percent of the village's waste stream.

While she realizes she has her work cut out for her, Ms. Holley remains optimistic that back-hauling can become a viable solution to Alaska Native villages' waste management problems. "There must be a way," she says, "When you stop trying, you're not going to find a solution."

Charting Their Own Course: Kokhanok Village Uses “Real Life” Examples to Teach Kids



Developing an environmental education program for your village or tribe that reflects its unique history, culture, and values is a lot like navigating uncharted waters. That’s what Roy Andrew, president of the Kokhanok Village Council (KVC), discovered when he decided to pursue a customized approach to teaching that used “real life examples taken from our own people, village sites, problems, and history.”

The KVC had decided to focus on educating children because it recognized that any money spent on cleanups and other environmental improvements would be wasted unless the next generation understood how the village’s growth and development had affected its environment and learned safer disposal practices. “We must impart our knowledge to future generations so that they don’t repeat the same mistakes,” Mr. Andrews asserts.

Like any maiden voyage, however, Mr. Andrew’s quest to develop a unique education program encountered many difficulties. The biggest setback occurred when Mr. Andrew, fresh from college and full of “pride in my work and my communication skills,” gave young village children “college style lectures” on the environment.

Instead of giving Mr. Andrews their rapt attention, he says “the kids became impatient, lost interest and just endured what I had to say” because their teachers were in the

room. The school subsequently cancelled the lectures.

Feeling defeated and despairing, Mr. Andrews thought about never teaching kids again. He eventually realized, however, that “he had nowhere to go but up.” He decided to learn from his mistakes and change his approach. Instead of doing everything alone, he brought in the KVC, Kokhanok School staff, village residents, and the students so they could “design a program together.”

Together, Mr. Andrews explains, “we took into account all of our mistakes and worked to develop a new type of curriculum utilizing many different types of education approaches for students from K-12.” Besides the curriculum, the village education plan includes:

- Student produced videos that document village environmental history and progress.
- An environmental fair and awards ceremony to recognize

school kids’ environmental achievements.

- A printing and learning center for kids to print booklets and posters.

To fund its plan, Kokhanok Village received two “small, but potent” \$10,000 grants from the Alaska Native Health Board. According to Mr. Andrews, small grants work well because “they force you to develop short-term, attainable goals.” The short, 4-page application was also appealing.

The Kokhanok Village president believes that values he learned growing up as a child in this small village of 170 people helped get him through the tough times and offer a model learning program for his people. He urges others to always keep their goals and a sense of higher purpose in mind so that when disappointments occur, “you don’t feel victimized and insignificant.” He adds: “Be persistent and ready to work hard!”

In the end, this advice paid off. True to Mr. Andrews' original goals and vision, the finished curriculum combines modern environmental concepts with "emik," or what Alaskans call the "insider's point of view."

Cultural messages are woven throughout its pages. For example, the lessons use village geographical features, such as Lake Iliamna and animals and birds such as seagulls, swans, caribou, and seals that live in and around the lake, to help children understand that "we are all connected in a very special bond and unity" that deserves respect.

Each chapter of the curriculum examines the changes in village fuel use, along with solid waste, water, and wastewater management practices from 1955 to the present. Detailed maps and diagrams show visually how the village has evolved, including who lived where during the various time periods, and what family dump they used.

The curriculum is also filled with terms like "culvert" and "chlorine test," but they are explained in simple language, and the concepts are



Abandoned appliances and other scrap metal collected during Kokhanok's cleanup.

driven home by diagrams of how, in this case, water flows through the village—from source to sewers.

Drawing on his love of anthropology, Mr. Andrews peppers the technical material with anecdotes and stories from elders so that young village children understand traditional culture and values. For instance, for years, families got water from Lake Iliamna in the winter by boring holes into five feet of ice and "packing" it in 2 five gallon buckets. The lake in winter served not only as a source of physical sustenance, but as a meeting place as well, much like the coffeehouses of today.

However, village elders assert that "self-reliance in providing water for ourselves" ended in 1996 when the IHS installed a modern water supply system, and brought in a core of qualified personnel to operate and maintain it. "Gone were the days of water holes, packing water, socializing, frozen water buckets...knowing who lit their steam baths on certain days and watching who and when anyone would go out to chop a hole in the ice," the elders lament.

It is village culture and history such as this that Mr. Andrews fought so hard to see come to light. And through his persistence, vision, and hard work, he's been able to see something equally as amazing—the children's eyes "light up" as they look at the maps and hear about their village history.



RESOURCES



Copies of the listed EPA publications can be obtained at no charge by contacting NSCEP (phone: 800 490-9198 or 513 489-8190; fax: 513 489-8695; e-mail: ncepimal@one.net). You will need to provide the document number for the publication(s) your wish to order. Contact for non-EPA documents are provided below.

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U.S. EPA. Waste Management in Indian Country. www.epa.gov/tribalmw

U.S. EPA Region 10 Tribal Office Home page. yosemite.epa.gov/r10/tribal.NSF/webpage/tribal+office+homepage?opendocument

CONTACTS



The *Tribal Waste Journal* would like to thank everyone who shared their stories and experiences for this issue. Interviewee contact information is provided below for those who are interested in learning more about specific tribes' programs.

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To be placed on our mailing list or submit ideas or success stories, send an e-mail to Janice Johnson, U.S. EPA Tribal Solid Waste Program at [<johnson.janice@epa.gov>](mailto:johnson.janice@epa.gov).



Kids Page



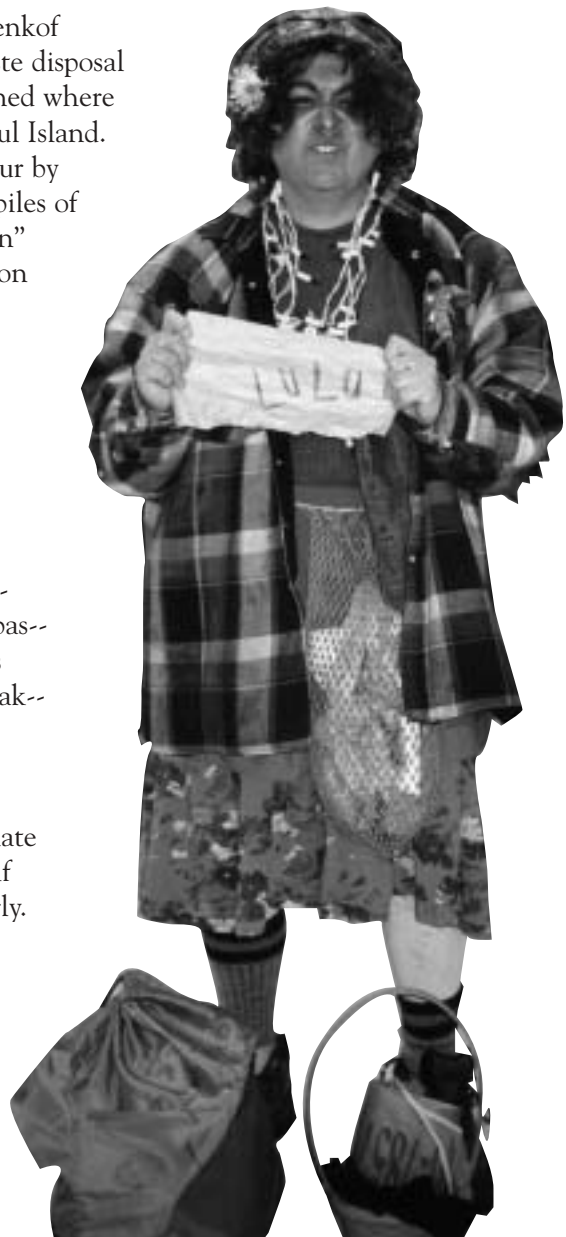
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Lulu the Landfill Lady

Meet Lulu the Landfill Lady. She calls the St. Paul Island landfill home. Lulu, also known as Aquilina Lestenkof, was created for the St. Paul Island Ecosystem Conservation Office's household hazardous waste (HHW) collection event. Ms. Lestenkof transformed into Lulu by pulling on orange and black-striped socks and pairing an old flannel shirt with a floral skirt. She also accessorized, draping a string of Christmas lights around her neck, adding a gaudy hat with pink flowers, and tying a mesh bag to a rope around her waste.

After residents dropped off drain cleaner, batteries, and other hazardous items at the collection event, Ms. Lestenkof offered to take them on a tour of the local landfill, leading interested children and adults onto a school bus destined for the dump. Young children eyed Lestenkof suspiciously, recognizing her face, but not her clothes. During the ride to the landfill, she talked fondly of her home among debris and many children began to believe that she was really Lulu.

At the landfill, Lestenkof described proper waste disposal practices and explained where waste goes on St. Paul Island. She spiced up the tour by referring to specific piles of debris as her "kitchen" or "bedroom." Back on the bus, she challenged children to think of waste reduction techniques, including reuse and recycling. As Lulu, she also bestowed buckets of "green" cleaning supplies to a few lucky passengers. The buckets contained vinegar, baking soda, and other alternatives to harsh cleaning products, which can contaminate local water supplies if disposed of improperly.



ONE PERSON'S WASTE IS ANOTHER PERSON'S WARDROBE

During an Earth Day fair, students on Prince of Wales Island used recyclable materials to create clothing and accessories, modeling their designs during a "trash-ion" show. The fair also featured a trash art display as some of the children used recyclable materials in collages and sculptures.

After the trashion show, students admired Earth Day logos designed for the event and participated in a poetry contest. They also strolled to tables staffed by representatives from the U.S. Forest Service, the Alaska Department of Conservation, and the Alaska Department of Fish and Game, where they received information about environmental issues and learned how to crochet backpacks, handbags, bath mats, baskets, and other items out of plastic bags. Students from the Organized Village of Kasaan talked about their red worm composting project. They feed food scraps to a bin full of red wigglers that process the organic material into nutrient-rich compost and sell small bags of the final product to community members.



The Ultimate Can Crusher

Can crushing and a solid waste management lesson produce a smashing combination in the classroom. Students learn that it is important to reduce the volume of waste by designing their own can crushers. Many Alaska Native villages ship recyclable materials such as aluminum cans to Anchorage or Seattle on barges or airplanes, where space is limited. By compacting materials, villages can ship more recyclable items. For some villages, recycling is not logistically or economically feasible, but landfill space is at a premium. Compacting can reduce the volume of waste and provide an alternative to burning.

After introducing the concept of simple machines such as levers and pulleys, teachers can collect rope, wire, hinges, screws, nails, wood scraps, bricks, blocks, and other materials and ask students to design a can crusher with them. Before beginning the construction phase, students



should write instructions for building their machine. They should also be able to explain how the machine will work. Under adult supervision, the construction phase can proceed, and when the students are finished, a testing phase can stimulate a discussion of waste volume reduction options available to villages.

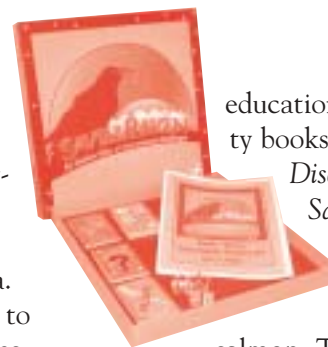
For additional information about this activity, visit www.epa.gov/epaoswer/osw/kids/quest/pdf/31crush.pdf, or order a free copy of *The Quest for Less: Activities and Resources for Teaching K-6* (EPA530-R-00-008) from EPA's RCRA Call Center at 800 424-9346 or 703 412-9810.

Savin' Raven

Be the first to experience the excitement of RurAL CAP's Savin' Raven game. This colorful board game is popular in schools, community halls, and homes throughout rural Alaska. Savin' Raven inspires children to discuss waste management issues affecting their communities.

The board includes nine destination sites, ranging from a dump to a community recycling center, spread across a map of Alaska. Players race to dispose of items such as styrofoam packing peanuts and used oil at the proper site. Along the way, they learn about environmental hazards and answer questions about solid waste management.

Rural CAP also distributes an educational kit that includes videos,



educational posters, activity books and curriculum.

Discovering Alaska's Salmon focuses on the life-cycle and cultural significance of salmon. The teachers'

guides also contain information and activities tailored to children in rural Alaska. One exercise, for example, involves interviewing elders to obtain information on past waste management practices.

Rural CAP provides Savin' Raven and the educational kit to rural educators for free. To order a copy, contact Ellen Kazary, RurAL CAP Environmental Program Coordinator, at 907 279-2511 or ekazary@ruralcap.com.