



Ahtna Intertribal Resource Commission Recipient Organization: PO Box 613, Glennallen, AK. Project Title: Ahtna Tribal Energy Assistance Planning and **Technical Assistance Project** Date of Report: 8-31-2021 Award Number: DE-IE0000048 Total Project Costs: \$1,100,343 Technical Contact: Karen Linnell, Executive Director 907-822-4466 karen@ahtnatribal.org **Project Partners:** Sustainability, Inc., William Wall, PhD Deerstone Consulting, Brian Hirsch, PhD Copper Valley Development Association, Jason Hoke

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Executive Summary

Ahtna Intertribal Resource Commission (AITRC) provided technical assistance and capacity building activities for eight (8) tribal communities in the Ahtna region to:

- reduce energy costs
- improve community wildfire readiness and biomass utilization
- provide local food security
- reduce unemployment, poverty and outmigration in the Ahtna villages.

AITRC provided community education on energy needs, conservation and efficiency, issues and options, assisted the tribes in identifying appropriate renewable energy systems, and increased their capacity to implement successful energy projects that employed local tribal members. AITRC also successfully assisted the member Tribes and Alaska Native Corporations in pursuing additional funding to advance their energy goals and projects, including Tribal Resiliency Planning, community biomass heating and wood resource assessment projects, and hydroelectric.

Program Partners

- Sustainability Inc., William Wall, PhD. Mr. Wall provided the research and planning for combining biomass removal for wildfire protection with utilization of biomass fuels to reduce energy costs while encouraging new growth of willow and other plant resources to increase the moose population thus increasing food security.
- Deerstone Consulting, Brian Hirsch, PhD. Mr. Hirsch and Devany Plentovich provided knowledge and expertise of renewable energy systems and community development to guide the development and implementation of tribal energy projects, including funding, capacity development and local job creation, evaluation of existing projects with suggestions for improvement, technical research and communication.
- Copper Valley Development Association (CVDA), Jason Hoke, Executive Director. CVDA is the Alaska Regional Development Organization (ARDOR) that provides economic development services for the Copper River region. They assisted in advancing the Roadbelt Intertie transmission project.





DeerStone Consulting

Sustainability, Inc.

Project Objectives

- Develop an integrated biomass energy/moose browse/fire protection plan for each village
- Update the regional energy plan and develop an integrated energy plan for each village's high priority energy opportunities, focused on weatherization and renewable solutions.
- Provide onsite training, outreach and planning assistance to each Village Council as requested.
- Sponsor regional training sessions in community energy and resource stewardship planning.

Approach: This project was known as a Food, Fuel and Jobs Program that sought to:

- **Reduce Energy Costs**: Reduce energy costs by replacing expensive heating with biomass fuels to provide heat and hot water to tribal homes and facilities and replacing generators that use diesel fuel with hydropower systems to reduce electricity costs.
- Improve Community Wildfire Readiness while utilizing the Biomass for Energy: Reduce the risk of wildfires to communities by providing Firewise services that remove trees and brush near homes and structures. Cut fuel breaks and thin forest outside of communities to remove accumulations of biofuels to control wildfires. Utilize the biomass resources to provide heat and hot water to homes and facilities.

Enhance community awareness of the link between biomass energy and fire protection.



Figure 1Cheesh'na Fuels Reduction under WUI project.

- **Provide Local Food Security**: Remove thick overgrowth of biomass materials to allow regrowth of willow and other vegetation (moose browse) to increase the population of moose, berries and other subsistence foods.
- Reduce Unemployment, Poverty and Outmigration in Ahtna Villages: Employ tribal members to institute responsible forest management practices that include harvesting, transporting and utilizing biomass energy resources.
- Tribal Stewardship Planning: Train, equip and assist tribal members in mapping traditional lands where Ahtna people conduct hunting, fishing and other subsistence activities and to reassume responsible management of these lands and their resources to ensure long term biomass energy supply and protection of traditional resources.

How Project Contributes to Tribe's Energy Vision

This project reduced and stabilized energy costs through implementation of conservation and renewable energy projects. Tribal biomass projects are replacing expensive heating oil with biomass fuels to provide heat and hot water to tribal facilities. A Tribal owned and operated hydroelectric system due to come on line in the coming year will reduce electricity costs in Chitina by displacing large amounts of fuel oil used to power diesel generators with clean, hydroelectric power for much of the year and a new BIA grant will help the community conduct a resource assessment to measure the amount of excess electricity generated during the year as well as biomass, solar, and other renewable resources that can be developed to further reduce energy costs in the community, which has the highest energy costs within the Ahtna region.

Perhaps the largest contribution of this project is that it empowered and increased the capacity of the Ahtna tribes to develop and manage their own sources of renewable energy and reduce their dependency on outside entities for vital services.

Activities Performed

Service Delivery: Technical Assistance services were initially provided through ongoing visits to communities, regional and annual meetings and other gatherings prior to the pandemic. From March 2020 through the end of the project the vast majority of services were provided through phone calls, texts, teleconferences, and emails. This was a significant deterrent for community outreach and education since the Ahtna region was hard hit by the COVID-19 pandemic and gatherings of any size were not possible and internet access for most people was extremely limited and very expensive for data plans in the villages.

Outreach: Outreach services were provided on an ongoing basis throughout the project. These services informed the tribes of the services that were available through AITRC's Tribal Energy Program, provided community education on energy issues and opportunities to lower costs through conservation and renewable energy projects. Consultation and trouble-shooting services were provided to tribes' existing renewable energy systems to assist in addressing obstacles to bring their systems back on line. AITRC's Newsletter was sent to all tribal households to provide education and information on energy efficiency.

Tribal Energy Planning: All Ahtna tribes have comprehensive energy plans in place that identify available resources and high priority opportunities and were part of the larger regional energy plan. Circumstances changed that altered AITRC's objective to integrate fire protection and biomass production with the energy plans that are discussed below and COVID prevented the opportunity of sponsoring community or regional meetings with tribal members.

As an alternative, AITRC provided the tribes with 2021 Tribal Energy Plan Updates. The updates consolidated all previous plans, incorporated progress on renewable energy projects and provided information and suggestions to encourage future tribal energy projects. The Updates included sample Tribal Energy Vision Statements that the tribes could revise and adopt, Tribal Energy Surveys for gathering data, recommendations for future energy projects and likely funding sources Each update was specifically tailored to each community. The drafts were circulated to tribal officials through meetings, emails and phone calls to ensure they were accurate and provided useful information. The plans were well received by the communities.



Figure 2 Native Village of Tazlina and Gulkana Village fuel for cord wood boilers.

Community Wildfire Readiness: AITRC had an existing Wildfire Urban Interface (WUI) grant through the State Alaska to complete the Firewise services in 3 tribal communities according to their approved Community Wildfire Protection Plans (CWPP). These services remove trees and brush from around homes and structures and help the communities make logistical preparations for evacuations in the case of a wildfire. Services for two of the villages were completed during the grant period and the third was delayed due to COVID but is scheduled to be completed in the coming months.

As AITRC was making preparations to initiate services in the next 3 villages it was discovered that those villages did not have approved CWPPs, thus the Firewise work could not be performed until there are approved plans.

Given that this region of Alaska is considered high risk for major wildfires and that so many communities in the region did not have CWPPs, AITRC sponsored a Regional Wildfire Protection Planning process. The process sponsored a series of teleconferences that brought all regional landowners and stakeholders together to discuss how the plans could be funded and completed. The teleconferences were well attended and all agreed the region was at high risk of wildfire and the planning needed to be completed sooner rather than later. During this process AITRC was advised by state and federal representatives that wildfire planning should not be linked to biomass harvest. Privately, these officials acknowledged that linking the two made perfect sense, but apparently "biomass" was a negative term to regional fire fighters.

The Regional Wildfire Planning problem was finally resolved when the State of Alaska Division of Forestry announced that the Bureau of Land Management had awarded a large grant to the state to complete all the CWPPs for region. AITRC was both pleased and more than a bit puzzled when the state's plan showed a strong commitment to linking wildfire prevention activities such as cutting fuel breaks with biomass harvest. AITRC continues to participate in community planning and support the state's effort to complete the regional planning process.

Tribal Stewardship Planning: AITRC provided computers, software and 2 years of Tribal Stewardship Planning training for village personnel. Five villages have completed their Stewardship Plans. This directly feeds into local capacity building and long term resilience



Figure 3 All eight Tribes and two ANCSA corporations participated in Tribal Stewardship Planning training.

Increase Local Food Security: AITRC's objective to increase food security was part of a comprehensive plan to restore the land and its habitat. Decades of preventing wildfires to protect communities and the infestation of spruce bark beetles have led to the dangerous accumulation of biofuels that can contribute to large uncontrollable fires, degradation of the forests and the reduction of plants and animal life that were relied upon as subsistence foods for the tribes. Biomass supply management is another component of this effort.

Project partner Bill Wall, PhD of Sustainability, Inc. completed a comprehensive Landscape Assessment for Ahtna/Copper River region. The assessment provided a comprehensive analysis of the land, resources, issues, and concerns. A primary recommendation of the assessment was to restore the land and habitat by allowing wildfires to burn wherever possible while providing Firewise services to ensure that homes and communities were protected. Controlled fires, fuel breaks and thinning were recommended to allow the new growth to emerge (moose browse) increase the moose population as well as the growth of berries and other subsistence foods.

The Landscape Assessment resulted in a collaborative long-term experiment between AITRC and Ahtna Inc. to clear large sections (1,500 plus acres) of wooded land in order to measure the results of the new growth and habitat restoration. This effort was

monitored for 3 years for beetle infestations, willow growth and the growth of new grains and other potential moose browse foods.

Two years into the project however Ahtna's new "let it burn" policy was reversed when efforts to combat climate change created the concept of carbon credit lands. Ahtna Inc. entered into an agreement to sequester large sections of their lands that changed the "let it burn" policy to protect the lands from wildfires.

USDA Natural Resource Conservation Service (NRCS) - Regional Conservation Partnership Program: To address the need for fuel breaks, thinning and other conservation projects AITRC was awarded a \$1.2 million RCPP Partnership agreement. AITRC's role was to facilitate communications between RCPP and regional land owners. AITRC coordinated meetings between RCPP staff with Ahtna Inc. and tribes in the region to conduct planning for conservation projects. Once the plans were approved by RCPP, Ahtna could move forward with the conservation projects that would be partially paid for by RCPP. Unfortunately, the first fuel break project got off to a bad start when Ahtna was denied payment due to a technical error and delayed this and future projects. While there was enough blame to go around by all stakeholders, the fact was that the program was overburdened with bureaucratic rules and regulations. Efforts have since been made to revise the rules and new projects are now going forward.

Technical Assistance for Biomass Projects: The majority of AITRC's time and efforts were devoted to assisting the tribes in trouble shooting existing biomass projects to bring them back on-line and planning and implementing new projects. The following is an analysis of the types of technical assistance services provided.

- Identifying Energy Champions: Outreach efforts increased awareness of the program and potential opportunities and helped to identify champions. We defined an energy champion as a tribal representative most interested in developing renewable energy projects and able to perform administrative tasks at the village level to keep projects moving forward. Once identified, these champions quickly became partners with AITRC on assessing and developing potential projects. Such champions emerged in several communities, which generally resulted in improved performance on existing projects and development of new projects. Our consultants DeerStone Consulting were instrumental in providing the necessary technical assistance to support the village energy champions and advance these projects.
- Resource Assessment and Technology: Most tribes were already aware that biomass was the most abundant renewable resource available but often were not aware of advances in new technologies that solved previous problems and made biomass systems more feasible. For example, at the beginning of the project wood chip boilers were not considered a wise choice since most boilers were not able to handle a variety of chips. Cordwood was considered too labor intensive for large heating projects by most communities and pellets were expensive and not available in the region. When tribes were educated on new technological

advances with wood chip boilers they became the most preferred boiler over cordwood or pellet boiler. Having case studies from nearby locations, such as the community of Tok, or within region such as in Mentasta, was essential to help people feel comfortable with this technology and understand that it was not experimental and had a successful track record in challenging circumstances.

- Determining Project feasibility: The best tool for encouraging biomass projects was the US Forest Service Pre-Feasibility Study. Tribes completed a simple request form for evaluation and the services were free. The tribes provided data on the amount and cost of fuel oil currently used for heating and AITRC consultants performed calculations to determine the feasibility of displacing fuel oil with a biomass system, potential cost savings, estimated number of jobs, etc.
- Securing Project Financing: Once feasibility was established the next step was to arrange financing. AITRC assisted tribes in identifying and applying for financial resources to fund their projects. AITRC provided the technical data for the applications and the tribes provided resolutions, letters of support, and other information as well as reviewing and editing drafts and submitting the application. This increased the capacity of the tribes to develop their successful applications. Several proposals were funded, which have resulted in biomass and Tribal resilience, and hydroelectric projects in the communities of Kluti Kaah, Mentasta, and Chitina, among others.

The primary source of this supplemental funding for biomass projects was the US Forest Service, Wood Innovations grant. These grants provided base funding for the engineering, purchase of the boiler and supplies but not enough funding to cover the cost of housing the boiler or other necessary items for completing a project. The remaining funds were secured through grants from the Denali Commission, a joint state/federal partnership agency that had a great deal of flexibility to cover all remaining items for projects.

- **Preparing Bid Proposals**: With funding in place the next step was to select engineers and vendors. AITRC and DeerStone Consulting provided technical support for reviewing their procurement policies, developing RFPs and establishing selection committees to review bids and advise on selecting contractors and vendors. This type of Technical Assistance that AITRC was able to provide was a perfect fit for the DOE-OIE Technical Assistance grant as the contracting experience we were able to provide was invaluable for long term project sustainability and, in particular with regard to avoiding mistakes that have been made by others.
- Facilitation of Project Team Meetings: AITRC sponsored teleconferences with tribal staff and project teams to ensure all work was coordinated.
- **Trouble Shooting**: Projects rarely go as originally planned and often require backup plans. A good example was Mentasta's second wood chip boiler project. The original plan was to purchase the same brand of boiler currently in use to

have redundancy in operations, parts, repairs, etc. Early into the project it was discovered that the cost for constructing a new building to house the new boiler would lead to cost overruns. The team opted to have their contractor install the new boiler in a Connex that could be transported to the site. It was then discovered that the same brand of boiler would not get approval from the Fire Marshal, was not as efficient as other boilers, and likely still had similar problems that were occurring with the first boiler. RFPs were then issued to several boiler vendors and bids were taken. A review committee was established with our staff, consultants, and members of the tribe. A selection was made for a new boiler that was much more cost effective, already installed in a Connex and was technologically advanced to overcome problems with the first boiler.

- Grant Administration: AITRC provided technical assistance to ensure there was open communications with Program Officials and assisted with reporting as needed. For the Native Village of Kluti Kaah biomass project AITRC provided technical assistance for grant administration while the community was struggling with other priorities and then helped provide additional capacity building and training for the community to develop internal resources to manage this.
- **Project Hand Offs**: As we close out our grant we still have three major projects in play that need for ongoing Technical Assistance. For the Chitina Hydro project AITRC has helped to bring together the Tribe and Village Corporation to share resources and expertise and strategize on how to leverage federal funds from the two entities. For biomass projects a request was submitted to the US Forest Services for additional consultation that has been approved.

Biomass Projects: During the project period AITRC provided technical assistance for ongoing and new biomass projects.

- Mentasta Tribal Council: Mentasta was already utilizing a wood chip boiler to
 provide heat and hot water to the school and some tribal office buildings prior to
 this project. AITRC assisted the Council in developing a new biomass project
 that is installing another wood chip boiler on the other end of the village to
 provide heat and hot water to two new tribal facilities including a health clinic.
 The Council currently gets its chips from a vendor outside of the region and their
 project employs one community member. There has been discussion about
 producing chips locally as the demand for biomass grows but this will require
 additional projects, market expansion, and further capacity development. This is
 a long-term goal if additional technical assistance were available.
- **Gulkana Village Council**: Gulkana had a biomass system in place prior to the DOE grant and had spent many years working on developing a pellet and compressed log mill. AITRC provided technical support for the mill (see attached Pellet Mill Trip Report and Analysis). Their current biomass systems utilize locally sourced biomass fuels and employs 3 community members part time. The mill has numerous issues to overcome to become operational and safety issues and the lack of reliable feedstock remains a primary obstacle that could be

addressed with more land management and harvesting planning and agreements among parties. AITRC conducted a site visit, evaluated the current pellet operation, and provided numerous outreach contacts offering to assist with addressing operational issues with the mill and negotiations with Ahtna Inc. to gain access to feedstock. We also identified several grant opportunities to provide further funding to the project but the village had numerous other issues to manage, including COVID, that were of higher priority and did not respond until the end of the project period.

- Cheesh'na Tribal Council: Cheesh'na has a pellet boiler that provides heat and hot water to the tribal facilities in a campus area prior to the DOE grant. The Council currently purchases its pellets from a vendor outside of the region and the project employs one community member. During the project period AITRC provided Firewise services to protect the community and consulted with the tribe about converting their pellet boiler to burn wood chips, per their request. Ahtna Inc. has a major conservation project schedule that will cut a large fuel break near the village that is expected to produce over 800 cords of wood that could be converted to chips, which are lower cost and easier to produce. AITRC has encouraged Cheesh'na and Gulkana to work out an agreement for Cheesh'na to trade raw timber for pellets or wood chips. This is another perfect example of an opportunity to provide technical assistance that could be followed up in a future program. COVID was a significant barrier to these discussions.
- Native Village of Tazlina: Tazlina had previously installed a Garn cordwood boiler to provide heat and hot water for their tribal facilities prior to the DOE grant. The cordwood fuel was made available through the clearing of easements for a new subdivision the tribe is developing. The wood was harvested by 4 local tribal members. During the project period it was discovered that the boiler system had not been operating for months at a time. AITRC provided technical assistance in troubleshooting the problem and locating a contractor who repaired the system and brought it back on-line. This was an important step to increase demand for the readily available biomass resource.
- Native Village of Gakona: Gakona had no renewable energy projects underway but was interested in reviewing biomass options. AITRC provided outreach services on developing a biomass system on several occasions but the village was reluctant to engage in developing a biomass system without having a supply of local biomass resources. Again, with additional assistance and opportunity for face-to-face discussions with other neighboring communities and Ahtna, Inc., this supply issue could be resolved.
- Native Village of Kluti-Kaah: Kluti-Kaah is in the process of developing a major biomass project that will provide heat and hot water to their existing tribal facilities and to the new multi-use facility under construction. AITRC was essential in helping to develop this project and has continued to provide technical guidance, coordination with all stakeholders, additional funding pursuits, and performance evaluation of proposed biomass heating technology. As discussed

above, Kluti-Kaah is currently working on a biomass harvest plan with Ahtna Inc. that will provide access to biomass resources on Ahtna land. This project is expected to employ 4-5 tribal members.

Biomass Resources: Ahtna Inc., the for-profit Alaska Native Regional Corporation for 7 of the 8 Ahtna Tribes, controls approximately 1.7 million acres of mostly wooded land that can provide a lifetime supply of biomass resources for its member Tribes. Of the biomass projects described below one currently utilizes biomass resources from their own tribal lands and only one from Ahtna lands. While Ahtna is agreeable to providing the tribes access to these resources it is a difficult process that requires addressing legal, cultural and related issues. AITRC and DeerStone Consulting provided technical assistance for addressing these issues by assisting the Native Village of Kluti-Kaah in securing a Bureau of Indian Affairs Tribal Resiliency grant that will bring NVKK and Ahtna together to establish a Biomass Harvest Plan.

At the beginning of our project tribes were mainly focused on getting the biomass systems up and running and had little interest as to where the biomass resources would come from but that is now changing. The NVKK agreement with Ahtna to establish biomass harvest plan will serve as a model for other Tribes. As new biomass projects come on-line it is expected that most, if not all, biomass fuels will come from Ahtna tribal lands and that the harvesting and transporting of these resources will be done by Ahtna tribal members. This represents local jobs, clean energy substitution for diesel heating fuel, and economic development opportunities for Tribal members in our region.

Chitina Native Corporation (CNC) Hydroelectric Project: The Tribe and Village Native Corporation, Chitina Native Corporation (CNC), have labored for many years to develop a viable hydroelectric project as they have substantial hydro resource potential. After a series of setbacks CNC had some existing funding and has been working on getting the engineering completed for a hydroelectric project. The project did not have the full amount of funding needed for construction and was struggling with project management. AITRC provided technical assistance for CNC to secure a \$3 million USDA grant for the remaining funding needed for construction and facilitated a series of meetings between CNC and the Alaska Energy Authority to get the project moving forward. The project is now in engineering and system design with construction expected to begin within a year.

At the same time, questions remained as to how much excess hydroelectric power would be generated during the summer months that could be used for economic development projects and how much, if any excess hydropower would be available in the winter for electric space heating to displace diesel heating fuel. Chitina also has substantial biomass energy resources that could be used for winter heating and because they have opted to not merge with Ahtna, they have more control over their own lands to provide the biomass resource. AITRC and DeerStone Consulting helped CNC and the Chitina Tribe coordinate on these opportunities to share technical capacity and funding opportunities. It should be noted that Chitina has the highest energy costs in the region at over \$0.70/kWh for electricity. Ultimately, AITRC assisted the community in obtaining a BIA Energy and Minerals Development Program grant to more fully assess the biomass and winter hydropower resources to determine the amount and value of diesel heating fuel displacement.

Energy Efficiency: AITRC's original strategy was to include energy efficiency presentations and discussions and have presentations at community and regional conferences. With COVID preventing large gatherings AITRC developed a new strategy to conduct an energy audit on AITRC's office building as a demonstration project. AITRC was awarded a technical assistance grant from DOE and engineers from the Alaska Tribal Health Consortium conducted the energy audit. The information is being disseminated through the AITRC Newsletter that is providing the results of the audit along with a series of energy efficiency measures that tribal members can use to make their homes and facilities more energy efficient.

Conclusions and Recommendations

Education and Capacity Building: AITRC has empowered and increased the capacity of Ahtna Tribes to lower their energy costs through conservation and renewable energy projects. More of the Tribes either have or are developing biomass projects and one is on pace to bring a hydroelectric project on line in the coming year.

Resource Development: This project increased the Tribes' awareness, interest and ability for developing and utilizing renewable energy resources on Tribal lands.

Employment: The Tribes are currently employing a small number of tribal members to operate energy systems that are expected to increase as more will be employed to harvest and transport biomass resources as more systems come on line. This is a classic "chicken and egg" conundrum in which more demand is needed through development of biomass heating projects while more supply is needed to feed these projects, and both sides are waiting for the other to develop. In reality this is a gradual and iterative process where both supply and demand need to be carefully cultivated with an eye toward replicating successful projects and broad community education. We feel like we are on this track but need additional support for this cycle to fully play out.

Funding: This is almost certain to echo the sentiments of other grantees. Most grants have a lag time during start up in hiring staff and getting organized. There is a learning curve involved in developing strategies, addressing obstacles and accommodating turnover of key staff. Energy projects tend to be complicated and generally take a long time to develop so for AITRC it seems like we are just getting started as our grant is ending. Our primary recommendation is for DOE to provide another round of funding. Whether the new round should mirror these technical assistance grants or not is debatable but it seems clear that stakeholders would agree new funding is needed to continue the progress we've made.

Lessons Learned:

COVID-19: There was general agreement that it would not be beneficial to blame setbacks or failures of the project on COVID, but the truth is that the pandemic took a major toll on the program by preventing face-face and community meetings. Good working relationships are often necessary to move projects forward and those relationships are best facilitated by ongoing face-to-face communications. As is often the case, this project was affected by changing circumstances that required altering our approach and to achieve our objectives. With COVID preventing ongoing face-to-face communications with the communities, Ahtna, and other stakeholders, and poor internet in the region, AITRC did its best to keep services and projects moving forward virtually but it still slowed down progress. What was most disturbing were interagency conflicts that arose that could not be resolved sitting across the table from those involved to resolve the issues. While no one could have predicted a pandemic, the lesson learned is that you have to be able to devise backup plans and adapt to changing times and priorities to address any obstacles that may arise.

Staff Turnover/Problems with Champions in Small Villages: Earlier we described the importance of having a champion in the village who can move projects forward. AITRC was fortunate to have some excellent champions to work with during this project. At the very end of the project two of our champions are now experiencing health and life issues that are affecting their ability keep up with their work. This in no way is an indictment of either. Both are terrific human beings who have gone above and beyond to help their villages but this is a common occurrence in small villages. Many important and productive projects have fallen apart when the champions are no longer available to move projects forward. In Anchorage or Seattle this would scarcely be an issue with so many potential applicants available but in a small rural village finding another champion can take months if at all. The obvious lesson learned here is to have champions find other champion. These issues are best addressed by developing personal relationships in the villages and openly discussing the issue but COVID did not allow for this process to go forward.

The Moose Bone Story: Our Final Report would not be complete without telling the story of the moose bone. Mentasta's first wood chip boiler had numerous problems that had to be overcome to keep the system on-line. One such problem occurred when the wood chips became clogged and the system shut down. Alaska winters are cold and it's an unpleasant job to have to dig through the chip bin to find the problem. After a fair amount of digging, Bob, the operator pulled out a moose leg bone that had apparently been deposited there by a village dog who was stashing it for a meal to be had later. The community has since restricted access to the chip pile. While people far and wide have enjoyed this story it is our sincere hope that Bob will one day be able to laugh about it.