Agency: Commerce, Community and Economic Development

Grants to Municipalities (AS 37.05.315)

Grant Recipient: Northwest Arctic Borough **Federal Tax ID:** 92-004866

Project Title: **Project Type:** Planning and Research

Northwest Arctic Borough - Kivalina Water and Sanitation Engineering Feasibility Study

State Funding Requested: $150,000 **House District:** 40 / T

One-Time Need

Brief Project Description:

The Study will identify the impacts upon the drinking water and sanitary infrastructure due to climate change in Kivalina.

Funding Plan:

Total Project Cost:	$150,000
Funding Already Secured:	($0)
FY2012 State Funding Request:	($150,000)
Project Deficit:	$0

Funding Details:

n/a

Detailed Project Description and Justification:

Kivalina is facing water and sanitation challenges in part due to the changing climate. To provide a healthy community environment, residents need access to safe water. Additionally, they need a sanitary solution for the disposal of waste. Some estimates suggest that it could be 20 or more years before the village is relocated. Despite the extended life provided by a new sea wall, few funding agencies are willing or able to invest money in what is perceived as a temporary community. As such, Kivalina presents a unique challenge to the public health community. A comprehensive engineering plan is needed to address the unique challenges faced in Kivalina that is adequate to bridge the transition period from their present community to that of the future. This engineering plan must address the changing water quality in the Wulik River with respect to the provision of safe potable water and must address the safe collection and disposal of human waste from the homes.

Project Timeline:

October 2011 - Receive funding

November 2011 - Execute Cooperative Project Agreement

December 2011 - Secure professional services for preparation of the study

May 2012 - Complete feasibility study (project funds will be expended incrementally during the development of the study)

June 2012 - Final project approval and project closeout (all project funds spent)

Entity Responsible for the Ongoing Operation and Maintenance of this Project:

n/a

For use by Co-chair Staff Only:

$150,000 Approved

10:26 AM 5/27/2011

Contact Name: Christine Hess
Contact Number: 465-4833

Grant Recipient Contact Information:

Name:	Janet Mitchell
Title:	Administrator
Address:	PO Box 50079
	Kivalina, Alaska 99750
Phone Number:	(907)645-2137
Email:	kivalinacity@aol.com

Has this project been through a public review process at the local level and is it a community priority? [X] Yes [ ] No

For use by Co-chair Staff Only:

10:26 AM 5/27/2011

Contact Name: Christine Hess
Contact Number: 465-4833

KIVALINA CITY COUNCIL

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RESOLUTION 11-01

A RESOLUTION OF THE KIVALINA CITY COUNCIL SUPPORTING ANTHC (Alaska Native Tribal Health Consortium) APPLYING FOR A GRANT OF $150,000 FOR AN ENGINEERING FEASIBILITY STUDY FOR WATER AND SANITATION

WHEREAS, the City of Kivalina is experiencing the effects of a warming environment and recently completed an assessment by the Center for Climate and Health-ANTHC of the health impacts of these changes on the community and the residents;

WHEREAS, the lack of adequate sanitation infrastructure was identified in the assessment as the most immediate health threat in Kivalina;

WHEREAS, the lack of infrastructure is related directly to the consideration of Kivalina as an imminently threatened community where infrastructure investment was likely to be at risk;

WHEREAS, the Corps of Engineers has completed a shoreline protection revetment project that is designed to provide adequate protection for the community for at least fifteen (15) years;

WHEREAS, the Kivalina water system cannot provide a consistent source of potable water for residents throughout the year, the capability of the water treatment system to provide an adequate supply of safe water is being compromised by changes in the water source and residents must haul water by hand thereby limiting the quantity of water that is necessary for basic sanitation needs and providing ample opportunities for contamination of the potable water supply in the home;

WHEREAS, the community also lacks basic wastewater infrastructure necessary to provide safe collection and disposal of human waste and residents must haul waste by hand to a disposal site that is subject to flooding that spreads waste into areas that are used for recreation and subsistence;

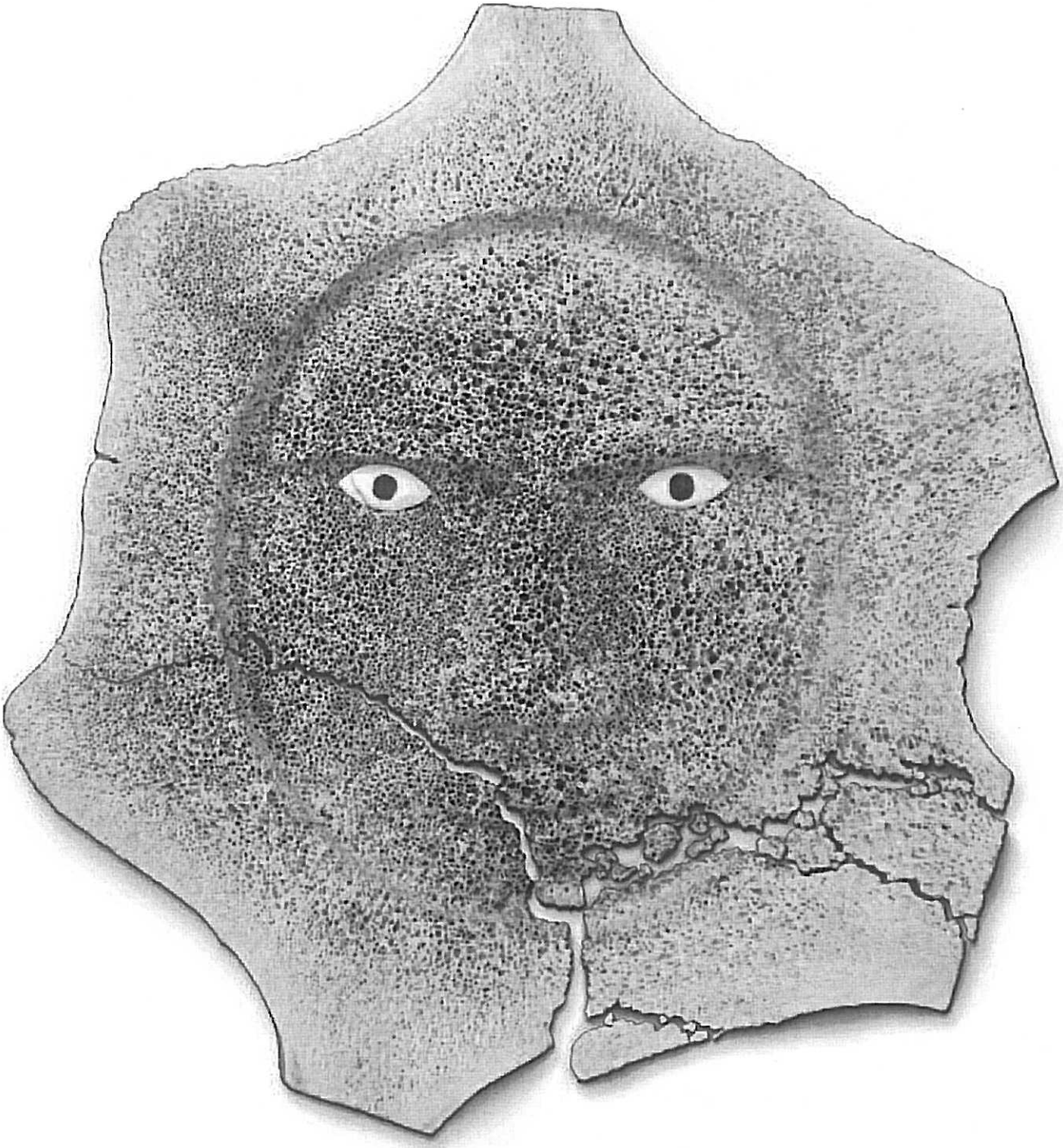
THEREFORE BE IT RESOLVED that an engineering feasibility study of approximately $150,000 is needed to clearly define the problem and the alternatives that are available to address the issues for the community. The feasibility will need to provide an analysis of the alternatives and make recommendations for the most viable alternatives with respect to capital cost, operational costs and community acceptance.

CERTIFICATION:

PASSED and **APPROVED** by a Poll Vote of the Kivalina City Council this 11th day of February, 2011.

Thomas M. Hanifan, Mayor	Yes ✓	No ___	Abstain ___
(out of town) Lucy S. Adams, Vice Mayor	Yes ___	No ___	Abstain ___
(out of town) Frances Douglas, Sec./Trea.	Yes ___	No ___	Abstain ___
Alice A. Adams, Member	Yes ✓	No ___	Abstain ___
Stanley K. Hawley, Member	Yes ✓	No ___	Abstain ___
(out of town) Austin Swan Sr., Member	Yes ___	No ___	Abstain ___
Colleen Swan, Member	Yes X	No ___	Abstain ___

ATTEST: City Clerk



Climate Change in **Kivalina**, Alaska

Strategies for Community Health

ANTHC Center for Climate and Health

Funded by

Report prepared by:

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Funded by United States
Indian Health Service Cooperative
Agreement No. AN 08-X59

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Jeff Smith MS, ANTHC
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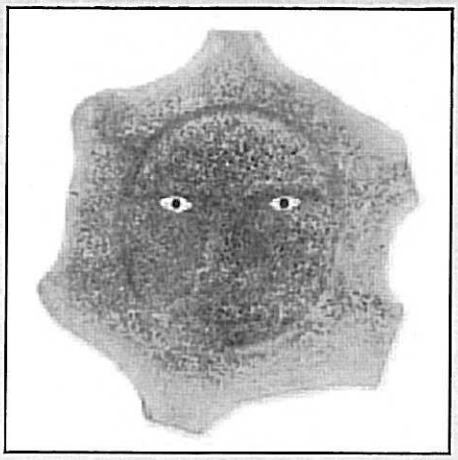
Through adaptation, negative health effects can be prevented.



Cover Art:
Whale Bone Mask by Larry Adams

ANTHC would like to thank the residents of Kivalina for their hospitality during our visits and for their assistance in preparing this report.

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A failed erosion prevention effort.
Courtesy of Millie Hawley.

There are many uncertainties about the future of Kivalina, but it is obvious that climate change is resulting in serious health challenges that need to be addressed. It is hoped that this report will facilitate informed decision making, and the development of adaptive measures that encourage a sustainable and healthy future for Kivalina and other communities in the Northwest Arctic region.

Anecdotal data was collected on the observations and experience from local experts in health, wildlife, whaling, Inupiat culture, weather, subsistence, education, sanitation, local governance, law enforcement, and emergency services.

Predictions and projections on future conditions such as warming, flooding, and erosion are based on available information, and limited by the quality of current scientific data and the uncertainties inherent in climate models.

The recommendations contained in this report are, in brief:

The lack of adequate sanitation is the most immediate health threat in Kivalina. Fear of losing public investment due to climate related erosion and flooding has discouraged agencies from making long overdue infrastructure improvements. As the new rock revetment wall has a projected fifteen to twenty year design life, sanitation improvements should now be made to address basic public health requirements. An engineering feasibility study should be performed to improve sanitation, and should then be funded to construct the required improvements.

Reducing the risk of climate related mental stress, injury, and disease is another priority in Kivalina. A study should be performed to address public safety concerns as a result of a storm surge. The study should address evacuation and shelter alternatives and be funded so that options adequate to the level of risk can be realized.

The community water system is vulnerable to climate impacts. Bank erosion in the Wulik River is decreasing water quality and could compromise the ability of the existing water treatment system to deliver safe water in adequate quantities. An engineering feasibility study should be performed to develop water treatment alternatives and should then be funded to construct the required improvements.

Enhancement of the community environmental monitoring infrastructure is also needed, so as to better understand climate change impacts. A local environmental observer program should be developed to improve weather data collection, erosion and permafrost monitoring, and surveillance of biota, subsistence, and environmental change.

Unusual and unpredictable weather, snow, ice and water conditions have made travel more hazardous. Use of personal locator beacons is encouraged to enhance search and rescue personnel's ability to locate people in peril.

Climate change is affecting subsistence activities, and may result in changes to harvest and diet. Periodic dietary surveys would help monitor changes in diet, and allow health workers to assess health risks and benefits.

This report is about the effects of climate change - both good and bad - on people's lives as described by Kivalina's residents and interpreted through the lens of public health.

The community is currently repairing the new waste water system. ANTHC is currently performing a review of IDCD-9 (patient visit) codes from the Kivalina Health Clinic (2000-2010) at the request of the City of Kivalina, the Kivalina IRA, and in collaboration with the Maniilaq Association and the U.S Centers for Disease Control, Arctic Investigations Program. The purpose is to evaluate the potential relationship between storm related damage to the community washeteria and patient visits to the Kivalina clinic for skin, gastrointestinal, and respiratory infections. The results are pending.

Recommendation: Kivalina's existing water and sanitation challenges are being exacerbated by climate change. To provide a healthy community environment, residents need access to safe water. Additionally, they need a sanitary solution for the disposal of waste. Some estimates suggest that it could be 20 or more years before the village is relocated. Despite the extended life provided by a new sea wall, few funding agencies are willing or able to invest money in what is perceived as a temporary community. As such, Kivalina presents a unique challenge to the public health community.

Although Kivalina residents continue to debate the location of a future village site, they speak with one voice when it comes to the need and desire for improving community health. This report recommends that they not have to wait for a relocation to receive the basic health services that they have needed for years.

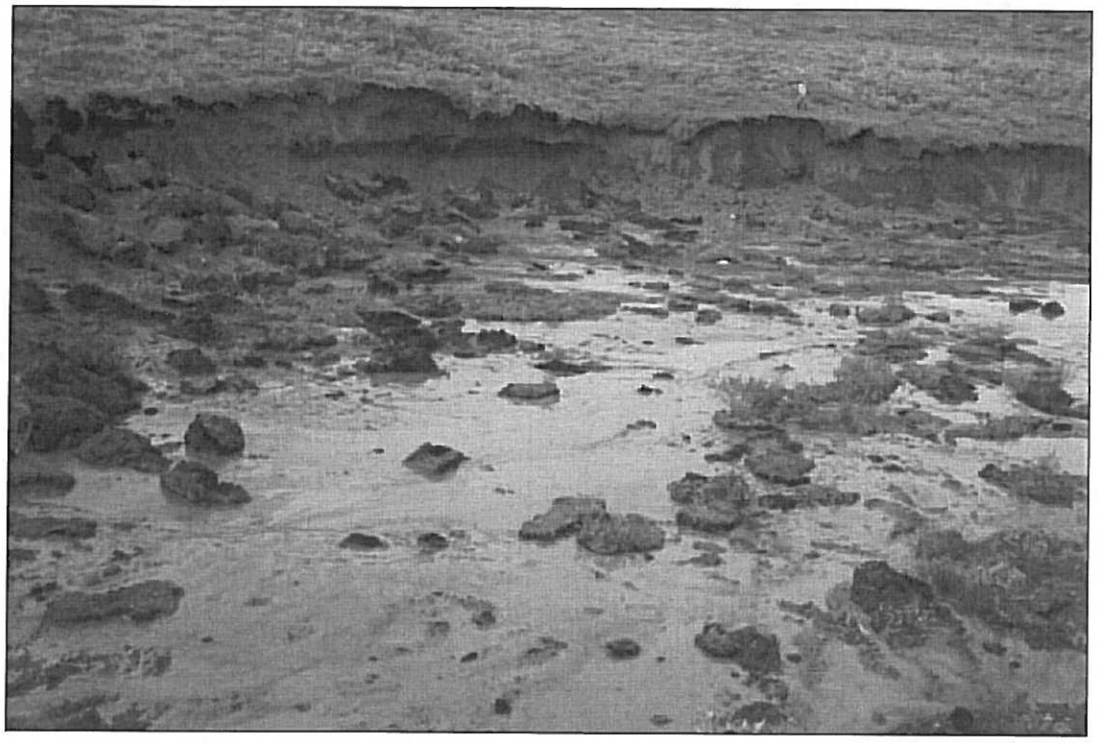
Public education is needed so that residents will know to treat water from traditional sources, and to prevent exposure to waterborne illnesses such as giardia. Research is needed to understand the changing dynamics of the water shed, and what it will mean for water quality in the river and the water security of the future. Monitoring of river water for turbidity, organics, temperature, pH, flow, and water level should be established. Vulnerability of the water distribution line to erosion should also be assessed.

The location of beaver lodges in the river system should be identified, potentially by using satellite images. If the beaver population is posing a significant threat to river navigation and community water supply, then discussions should be entered into with Alaska Department of Fish and Game and a management plan should be developed that will keep the beaver population in check, and the river flowing. Baseline water samples to assess the implication

Although Kivalina residents continue to debate the location of a future village site, they speak with one voice when it comes to the need and desire for improving community health.

of organic loads and other contaminants in the river water should be performed. Continued monitoring of the physical, chemical, and biological condition of the source water is recommended.

A comprehensive engineering plan is required to address the unique challenges faced in Kivalina that is adequate to bridge the transition period from their present community to that of the future. This engineering plan must address the changing water quality in the Wulik River with respect to the provision of safe potable water and must address the safe collection and disposal of human waste from the homes. An assessment by the State of Alaska, Rural Utility Business Assistance program (RUBA) would provide support to the city for improving operation of the water system and other critical health infrastructure.



Wulik river slump.
David Harbke.

A comprehensive engineering plan is required to address the unique challenges faced in Kivalina to transition from their present community to that of the future.