

**EVALUATION OF THE ALASKA NATIVE  
HEALTH BOARD SANITATION FACILITY  
OPERATION AND  
MAINTENANCE PROGRAM**

FINAL REPORT ON PHASE II PROJECTS

VOLUME II: COMMUNITY REPORTS

PREPARED BY  
INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH

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INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH  
UNIVERSITY OF ALASKA ANCHORAGE  
3211 PROVIDENCE DRIVE  
ANCHORAGE, ALASKA 99508

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## **Introduction to Volume 2**

The following is a brief explanation of the general format and key words used in the O&M Project descriptions. We have tried to follow the O&M project information, village language and agency terms as much as possible. In several instances we made slight modifications with the aim towards consistent descriptions among villages and several agencies.

### **Project Plan**

The text of the project plan task descriptions comes from the partnership agreements each city or tribe developed with the Alaska Native Health Board (ANHB). A few of the task descriptions were edited for readability. The authors, for cross-case consistency, developed the subject areas shown in italics. The subject areas were derived from groupings developed by ANHB, the project coordinating committee, and descriptions used in project reports developed by different agencies.

### **Project Implementation**

Each project description starts with a brief summary of the grant history, followed by a narrative of the project implementation. The narrative is organized by subject area, starting with development of the project plan. The subsequent subject areas are generally organized by order of occurrence during the project. In cases where a particular activity, such as replacement of a boiler, could be grouped in several subject areas (facility improvements, maintenance, or parts and supplies), the activity is usually described under the subject area it was listed in the project plan. In some cases an activity may be included in another subject area because of changes during project implementation or for consistency in the narrative.

Subject areas that were not listed in the project plan were added for some project descriptions to describe particular aspects of the implementation that affected the outcome of the project, such as Boards or Committees or Turnover. Non-project funded activities are included in the narrative only if they related to, or contributed to, the completion of the O&M Project, such as, visits by agency staff (RUBA, LGS, RMW, VSW or PHS).

### **Project Outcomes**

The description focuses on outcomes prompted by the O&M Project. It does include outcomes that were partially supported by the O&M Project, village efforts or agency staff. For the most part this section does not include achievements that may have occurred during the grant period that are substantially due to village or agency efforts (and minimally due to the O&M Project).

## **Research Questions**

The answers to the within-case research questions are briefly described in the text and summarized in a table. The determination of the qualitative measure for each outcome indicator was based on evaluation of the O&M Project record assembled by ISER. The following are descriptions of the terms used in the table:

**Outcome Indicators** -- These are short phrases (shown in bold) that paraphrase the research questions developed at the beginning of the project. The outcome indicators are described in terms of the data items collected during ISER's evaluation. The sources of these data items includes: project workplans, community quarterly reports, additional community supplied information, phone logs, operator interviews, project closeout interviews, data gap interviews, focus groups, agency trip reports, agency quarterly reports, and other available information.

**Operator Hours** -- The hours per week the operators reported to work.

**Scheduled Maintenance Activities** -- Routine maintenance activities as prescribed in a preventive maintenance plan.

**O&M Policies, Procedures or Planning** -- The development, revision, or adoption of policies, procedures or planning related to the operation or maintenance of a village water or sewer system; including development of an O&M plan, a maintenance schedule, a system of record keeping or reporting, a system for inventory and record keeping for parts, a system for identifying and ordering parts, or an O&M assessment.

**Operator Skills** -- The capability and experience of the operators to operate and maintain a village water or sewer system as indicated by certification status, training, or experience.

**O&M Resources (Tools, Parts & Supplies)** -- Tools, parts or supplies that are used in the operation and maintenance of a village water or sewer system, including an inventory of critical spare parts, chemicals and supplies for routine operations, and tools for operations, maintenance and repair activities.

**Condition of Facilities** -- The maintenance of the physical plant of the water or sewer facilities, such as boiler replacement or installation of shutoff valves. Installation of new facilities, such as adding flush tank haul units to homes or completing a new sewage lagoon. In villages with honey bucket haul or flush haul systems this includes the purchase of haul vehicles.

**Collections** -- (1) The processes used to enter customer names, send notices or bills, record and track utility customer payments, and communicate and enforce customer obligations to pay; (2) the amount of revenue collected from water, sewer and washeteria fees.

**Cost Efficiency** -- The results of activities that contribute to decreasing operational cost per unit output. This includes: decrease in water consumption through education or water line repair; improve level of service by improved maintenance; or decrease time to conduct monthly billing due to software or training improvements.

**Financial Management** -- The management of the financial activities related to management of a water or sewer system; including, billing, collections, purchasing, record keeping, payroll taxes, accounting, debt management, budgeting, fiscal control, or financial reporting. This includes upgrading computer software; improve bookkeeping through staff hire or training; or improve fiscal reporting to council.

**Utility Management** -- The structures and resources for governance or organizational management of the water or sewer facility system, including policy making and oversight by a board or council, executive leadership, oversight and planning by a manager or administrator, and clerical and administrative support by a manager or clerk.

**Utility Policies, Procedures or Planning** -- The development, revision, or council adoption of policies, procedures or planning related to the utility management of a village water or sewer system, including ordinances, user agreements, policies and procedures for collections, incentives or enforcement, rate studies, customer surveys, and facility or financial planning.

**Community Involvement** -- The participation of community members in discussion or action related to the water or sewer system in the village individually, through surveys or meetings, or councils, or evidence of active community support in the form of positive comments or behavior regarding customer responsibility for fees or O&M.

**Change During the Period** -- A qualitative measure of the change that took place during the project period (described at the beginning of the project implementation section), regardless of who caused or funded the change. There are four descriptors of the change:

Improved (Increased) - the indicator improves or increases by a substantial amount. For example, collections goes up by 30% or utility bookkeeping becomes a separate account and is well maintained;

About the Same - the indicator stays about the same, this may also include instances where there may be a slight increase or decrease during the project period;

Declined (Decreased) - the indicator declines or decreases by a substantial amount. For example, operator hours goes down by 15% or budget reserves decreases by 20% ; and

Unable to Determine - there is insufficient information or corroboration between sources to determine what change may have occurred.

**Change Caused by the Project** -- A qualitative measure of the change that takes place during the project period (described at the beginning of the project implementation section), that is due to the O&M Project. There are four descriptors of the change:

Significantly - the change in the indicator was substantially attributed to the O&M Project. For example, the change caused by a utility clerk hired by the grant or parts paid for by the grant;

Partially - the change in the indicator was due in part to the O&M project, and in large part to, or in combination with, other resources, such as existing village staff, RUBA, LGS, RMW or other grant programs; or there was some work on this indicator, with no significant change in outcome;

No - the change in the indicator was not due to the O&M Project; an

Not Accomplished – the work plan included tasks in this indicator but they were not accomplished; and

Insufficient Information - there is insufficient information to identify who or what caused the change.

### Long-term Effects

This is an estimate of the benefits of the project the village will continue to receive several years after the project was completed. In some cases there is a clear long-term benefit, for example, the replacement of leaking water lines. In other cases the benefits are less likely to be long-term, for example, providing over-the-shoulder training where there is a high staff turnover and no institutional continuity.

<b>INDEX OF SUBJECT AREAS INCLUDED WITHIN O&amp;M PROJECT DESCRIPTIONS, BY VILLAGE</b>
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Subject Area	Chefornak	Galena	Kiana	Kongiganak	Koyukuk	Mekoryuk	Napaskiak	New Stuyahok	Noatak	Nondalton	Shaktoolik	Shishmaref	Tanacross	Tanana	Unalakleet	Venetie	Count
Billings & Collections	X		X					X		X	X						5
Boards or Committees	X			X					X					X			4
City/Tribe Cooperation	X	X					X							X			4
Community Involvement		X													X		2
Customer Education				X	X	X	X	X	X	X	X	X	X				10
Facility Improvements							X			X	X	X					4
Financial Management	X					X			X		X	X		X	X		7
Maintenance			X					X	X			X	X	X	X		7
Office Equipment	X					X		X									3
Ordinances													X				1
Partnership Team	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	16
Parts & Supplies			X	X	X	X		X				X	X		X		8
Planning		X	X	X										X			4
Rate Study		X									X						2
Training	X		X	X	X	X	X	X	X	X		X	X	X			12
Turnover			X	X	X						X	X			X		6
Utility Manager/Clerk			X	X	X						X	X	X		X		7
Utility Management		X				X	X					X			X		5

## **Chefornak**

Chefornak is a Yupik Eskimo village located on the south bank of the Kinia River in the Yukon-Kuskokwim Delta. The villagers live a subsistence lifestyle with some commercial fishing. There are two forms of government: the City of Chefornak, a municipal second class city, and the Chefornak Traditional Council, a federally recognized tribe. The city operated the water and sewer facilities at the beginning of the project, and by the end of the project the tribe operated the water and sewer facility.

Nine wells provide water for the village, only one of these wells supplies the water treatment plant. A four-mile circulating loop distributes water to eleven watering points before returning to the water plant. The homes are not plumbed. In 1998 a new water treatment plant was constructed. Honeybucket hauling services consist of a four wheel ATV and trailer collecting septage from collection points and hauling to the lagoon. A new flush haul system was constructed in 1998.

In 1997 the population was 405. The 1990 median household income was \$20,278. The First Year Report provides detailed background information on Chefornak, its water and sewage system, operations, maintenance, and management.<sup>1</sup>

### **Project Plan**

The City of Chefornak requested \$15,915 to carry out a workplan with the following tasks:

*Partnership Team.* The City of Chefornak will form a partnership team with: the RUBA staff, the VSW engineer, the Lower Kuskokwim School District and other agency representatives.

*Office Equipment.* The city will conduct a parts inventory for a computer system then research, select, purchase and install a computer.

*Training.* The city will inquire among the partnership team for training on computer usage and utility billing.

*Financial Management.* The city will set up accounting system for each home, payroll for the water & sewer operators and train clerk on accounts payable.

*Billings and Collections.* The city will conduct on-going operations that include monthly billings and collections and ordering supplies

### **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The tribal council used \$15,915 (100% of the grant award), with a community match of \$25,087.

#### **Partnership Team**

The City of Chefornak described in their O&M grant application the need for a computer so they could shift the billing from manual to computer based. They wanted to make this change in preparation for a new flush tank haul system (FTH). The FTH was

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<sup>1</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

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originally scheduled for construction 1997, but was postponed to 1998. The city clerk developed a workplan prior to the ANHB staff person arriving for the initial visit. RUBA staff was in the village at the same time. The three discussed the need for the computer, what type of computer, what software the city needed, and who could provide assistance and training. The clerk processed the workplan quickly and received funding to purchase the computer.

Throughout the project the RUBA staff and VSW engineer met with the utility clerk to help her transfer the billings and collection from paper files to computer files. The VSW engineer recommended, and made available, a consulting engineer to assist the utility clerk during different phases of the O&M Project.

### **City/Tribe Cooperation**

Soon after the project started in July 1997 the city and the traditional council agreed to transfer the utility from the city to the tribe. The O&M Project was included in the transfer. The traditional council decided to establish a utility board to manage the water and sewer utility. The transfer process took from July 1997 to February 1998 before it was completed. The tribe supports the utility with free office space free electricity and heat.

### **Office Equipment**

In the fall of 1997 the utility clerk purchased the computer. Once the computer arrived the clerk set it up and received operations assistance from the Tribal Administrator. A consulting engineer helped the clerk with setting up the computer. The Association of Village Council Presidents provided an email system.

### **Training**

The utility clerk received day-to-day training on the computer from the tribal administrator. On a less frequent basis the utility clerk received training on the computer and accounting software from the RUBA staff and a consulting engineer. In April 1998 the utility board chairperson and the utility clerk attended workshop sponsored by the Yukon Kuskokwim Health Corporation and DCRA "Introduction to Utility Management" in Bethel. This training served as an introduction to many of the concepts, principles and practices of utility management. The training was beneficial to the clerk and board chair.

### **Utility Board**

After the city transferred management of the water and sewage utility to the tribe in February 1998. The tribe established a utility board to oversee the new FTH system. The board consisted of five people from the community, and no council members. They were scheduled to meet once a month. When they first started they had difficulty getting members to attend meetings. At first the Board members volunteered their time, later they were paid \$20 per meeting.

## **Financial Management**

The utility clerk's position was transferred to the utility board. Installation of the FTH system was delayed; thus affecting the urgency for developing the computerized billing system. With the installation of the FTH in the first 12 homes in 1999, the accounting system was setup on the computer.

## **Project Outcomes**

The City of Chefornak transferred the utility to the Chefornak Traditional Council who finished the O&M Project. The Chefornak Traditional Council completed all the workplan tasks. The project outcomes include:

Purchased a computer and software for utility billing & collections;  
Received training on use of the computer; and  
Established utility billing files.

While not in the project workplan, the utility transfer and the setting up of the utility board was one of the key improvements during this period. The utility board was slow to get started. Once they started meeting they did vote to raise rates for water and honeybucket haul. The O&M record does not have information on whether the new rates cover the cost of service. One difficulty encountered was pacing the training on establishing the accounting system with installation of the FTH. The delay in FTH installation decreased the sense of urgency to have the accounting system operational.

## **Research Questions**

The table summarizes the outcome indicators for Chefornak. As a result of the O&M Project none of the six O&M indicators improved. The financial and utility management improved when the tribal staff set-up the utility bookkeeping and received training from a consultant and RUBA staff. The O&M Project partially supported the tribal staff personnel costs. The efforts by the city, tribe and several agencies lead to an overall increase in four of the twelve indicators.

The factors we believe contributed to the city and tribe's capacity to accomplish the project outcomes include:

The city and tribe's cooperation on transferring the utility management in the village;  
Training support from a consultant and agencies; and  
Willingness to fund water & sewer utility services from bingo and other sources, in addition to user fees.

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<b>OUTCOME INDICATORS FOR THE VILLAGE OF CHEFORNAK</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Decreased	No	For the two operators interviewed in 1997 and 1999, their hours decreased. It is unclear exactly how much they decreased.
Percentage of Scheduled Maintenance Activities	Unable to Determine	No	The operations and maintenance are believed to have decreased because operator hours decreased.
O&M Policies, Procedures or Planning	About the Same	No	While there is some activity in this area, it does not appear to cause a change.
Operator Skills	Increased	No	Two operators attended training, but did not pass certifications. One operator did receive his OIT.
O&M Resources (Tools, Parts & Supplies)	About the Same	No	With the transfer it is believed to be slightly more difficult to get parts.
Condition of the Facilities	Improved	No	VSW project improved the facilities.
<i>Financial and Utility Management</i>			
Collections	Unable to Determine	Insufficient Information	While the utility rate goes up, it is unclear if revenue increases.
Cost Efficiency	Unable to Determine	Insufficient Information	Insufficient information available in the record.
Financial Management	Improved	Significantly	RUBA worked with the tribe to improve billings. Consultant trained utility clerk on computer and setting up utility billings and collections.
Utility Management	Improved	Significantly	Utility clerk improved utility operations.
Utility Policies, Procedures or Planning	Improved	No	The utility board passed a rate increase.
Community Involvement	Increased	No	The tribe supported transfer of the utility from the city to the tribe. The utility board helped the community understand the need for a rate increase.

### **Long-term Effects**

Chefornak is undergoing a transition in utility management. In the past the city has had difficulty paying their taxes and managing their accounts. These financial problems are one reason the utility was transferred and the utility board was established. From the information in the record, it appears the traditional council and the utility board are improving the operation of the water & sewer utility. This stems from a combination of the utility board putting in the effort, the city and tribe contributing subsidies, the support from RUBA staff, VSW efforts, ANHB phone support and the support of their consultant.

## Galena

Galena was established near an old fish camp in 1918 as a supply point for the nearby lead ore mines. The village is located on the north shore of the Yukon River in interior Alaska. In 1920, Koyukon Athabascans living upriver began moving to Galena to sell wood for the steamboats and to haul freight to the mines. The establishment of two Air Force Bases near Galena in the 1940's and 1950's brought growth and change to Galena. There are two forms of government: the City of Galena, a municipal first class city, and the Loudon Tribal Council, a federally recognized tribe. The city operates the water and sewer facilities.

Water is drawn from wells, treated and distributed through a piped water system or delivered by truck to home water tanks. Sewage disposal is handled by individual septic tanks or truck haul. Approximately 50% of homes are fully plumbed.

The population in 1997 was 543. The 1990 median income per household was \$28,611. The First Year Report provides detailed background information on Galena, its water and sewer system, operations, maintenance, and management.<sup>2</sup>

### Project Plan

The City of Galena requested \$12,000 to carry out a workplan with the following tasks:

*Partnership Team.* The City of Galena will form a partnership team with the Loudon Tribal Council and the Alaska Native Health Board. Within the City, people who will work on the project include the City Manager, Public Works Director, Mayor and City Council.

*Planning.* The city will design and conduct a survey to assess existing sewer and water conditions in the city. The information will be compiled on a computer spreadsheet with summary reports.

*Rate Study.* The city will review city utility billing records and compile data on deliveries, collections and other systems to determine a rate structure for the various components of the utility.

*Planning.* The city will research alternative technology for septic systems and hire a contractor to excavate and sample soil conditions.

*Partnerships.* The city will set up a meeting with ADEC and the Rural Sanitation Council Task Force to discuss a summary report on the project.

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<sup>2</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The city used \$12,000 (100% of the grant award), with a community match of \$17,000.

### **Partnership Team**

The City moved quickly to develop and finalize the workplan with ANHB. The city started working on the specific project tasks in July 1997. While these included some conversations with partnership team members, it was not until after fishing and hunting season that the city was able to start meeting with the partnership team. For the community survey and the rate study the city worked primarily with people in the village. For the alternative technology task the city worked closely with an engineering consultant from Anchorage and the ADEC wastewater permit staff person in Anchorage.

The city's public works director was an active participant at the Governor's Council on Rural Sanitation. His perspective was key in discussions with ADEC to allow the alternative technology developed for the city to be permitted.

### **Planning**

#### *Customer Survey*

The city staff developed a customer survey to gather detailed information on current water and sewer practices among Galena's residents. The questionnaire identified the number of homes that utilize the different types of water delivery (piped, truck delivery, on-site well, and self-haul) and sewage disposal (sewage truck haul, septic tank, honeybucket or outhouse). The City hired two college students to go door-to-door in Galena to implement the survey. The students collected 229 surveys of houses and businesses. The residents responded favorably to the survey; only one person did not want to answer the questions.

#### *Alternative Technology*

The city received complaints from residents about the odor in some areas that used septic systems. The city wanted to fix these problems and was interested in using an on-site method for sewage disposal because it would be less expensive than a piped or haul system. The city hired an engineering consultant to conduct a sub-surface soil investigation in an area of town with sandy soils and discontinuous permafrost. The engineer dug test pits in a selected location to determine the soil profile. Based on these results the engineer developed a design for an alternative treatment method.

The city met with ADEC wastewater permit staff in Anchorage to review the engineer's proposed design and find out if the agency would approve the design. ADEC approved the alternative treatment design. The city was interested in using this alternative treatment design as a means to provide lower cost sewage treatment. The information provided by the engineer and ADEC was included in the sanitation deficiency report the city submitted to PHS. PHS provided the funds in 1999 for 20 to 30 septic tanks in Galena.

### **Rate Study**

In their O&M grant application the City of Galena described a key need to conduct a rate study to improve the price structure of the water and sewer utility. The customer survey provided a representative description of water and sewer use at each house. The college students who conducted the customer survey also reviewed the utility bills for the past year at the city offices. In some cases they were able to make comparisons between the customer response in the survey and the actual details in the utility bills. Based on the results of the survey the city was able to gain an understanding of the residential use patterns and the cost of specific sub-systems (such as, delivered water or piped water) of the water delivery and wastewater collection system.

### **Utility Management**

Based on the results of the customer survey the city updated the geographic information system (GIS) that it is developing. (The GIS development, maintenance and updating with the results of the survey are outside the scope of the O&M Project.) The GIS database was updated to identify the specific water delivery and sewer collection method at each house. This contributed to a very specific description of the sanitation deficiencies in the city. The public works director believes the GIS is a very effective tool and that it proved beneficial in obtaining grants for improvement of the piped water system.

### **Community Involvement**

The city hosted a public meeting with residents to discuss the collection of background information for improvement of the water and sewer system. The residents expressed satisfaction with city's efforts to learn the individual customer attitudes and situation prior to moving ahead with expanding the piped water system.

### **City/Tribe Cooperation**

During the project period the city and Loudon Village Council negotiated a Memorandum of Understanding, creating the Galena Waste Management Steering Committee (GWMSC). This committee oversees an integrated waste management approach for solid waste. Although the committee did not form as a direct result of the O&M grant, it does provide some support to the on-going O&M efforts by the city.

## **Project Outcomes**

The City of Galena completed all of the workplan tasks. The project outcomes include:

- Completed the customer survey;
- Developed a more complete understanding of the utility rate structure;
- Completed an engineering report on an alternative wastewater treatment technology; and
- Involved the community in a discussion of utility improvements.

There is also a better working relationship between the city and several agencies: PHS, VSW, ADEC and RDA. Coordination between the city and tribe improved, as the

two worked together on the Galena Waste Management Steering Committee. The O&M Project and ANHB staff provided some of the support to improve these relationships, however, the general trend in the village is towards improving relationships. The public works director believes the information gathered as a result of the O&M grant helped secure more than \$1,500,000 in grants from PHS, VSW and RDA due in part to the survey and engineer consultation. This funding will be used to install additional septic tanks and expand the water system.

The city has a better understanding of how residents use the water and sewer utility because of the results of the customer survey. The city would have collected the information with city funds eventually. The O&M Project provided funds for the city to collect the information sooner. Thus reducing the city's delay of accomplishing the intended goal of improving the sanitary conditions for its residents.

### **Research Questions**

The table summarizes the outcome indicators for Galena. As a result of the O&M Project none of the six O&M indicators improved. The O&M Project contributed to an improvement in the utility planning by funding the customer survey, rate study and septic system soil investigations. Community involvement increased as a result of the customer survey and the city's community meetings. The efforts by the city and several agencies lead to an overall increase in two of the twelve indicators.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Focused workplan that included components of a larger community effort to improve utility management;

City staff who focused on gathering specific information for the city to use in its applications with agencies; and

Communication with its customers and agencies on a process for information gathering, analysis and implementation.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF GALENA</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	No change in operator hours during period.
Percentage of Scheduled Maintenance Activities	Unable to Determine	Insufficient Information	Not enough information to determine if there was a change.
O&M Policies, Procedures or Planning	About the same	Insufficient Information	
Operator Skills	Decreased	No	Experienced operators left, new operators have less experience. One operator did improve his skills during the period.
O&M Resources (Tools, Parts & Supplies)	About the Same	Insufficient Information	Parts and supplies appear to be available as needed.
Condition of the Facilities	About the Same	Insufficient Information	
<i>Financial and Utility Management</i>			
Collections	About the Same	Insufficient Information	
Cost Efficiency	About the Same	Insufficient Information	
Financial Management	About the Same	Insufficient Information	
Utility Management	About the Same	Insufficient Information	
Utility Policies, Procedures or Planning	Increased	Significantly	The engineering report on the septic systems will contribute to improvements in the future. City conducted rate study.
Community Involvement	Increased	Significantly	The door-to-door survey appears to have generated more support for the utility.

### **Long-term Effects**

There are three areas we believe are important for the long-term success of this project.

First, the customer survey provided the utility managers a realistic appraisal of customer use of the system. This information described patterns of utility use that the city can use to make improvements in subsequent years.

Second, the process of the city meeting with ADEC wastewater permitting staff improved their working relationship. This should contribute to better communication during subsequent wastewater permitting activities.

Third, the customer survey and wastewater technology fieldwork provided critical background information that will continue to aid the city with securing additional funding for improving the utility.

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The city is in the process of developing and implementing a comprehensive plan. The O&M Project decreased the number of years it took the city to develop the information used in the comprehensive plan.

## Kiana

Kiana is an Inupiaq village located on the north bank of the Kobuk River at the confluence of the Squirrel River. The villagers live predominately a subsistence lifestyle, depending on salmon, caribou, moose and berries. There are two forms of government: the City of Kiana, a municipal second class city, and Kiana Traditional Council, a federally recognized tribe. The city operates the water and sewer facilities.

The water treatment plant was built 1971, one of the first that the PHS installed in rural Alaska. Water is pumped from one of two wells, then treated and stored in a 200,000 gallon tank. Water is pumped through a pressurized circulating piped system. The homes are not metered. Approximately half of all homes are connected to the piped system.

Sewage collection system was built 1980 and flows via a gravity system to a holding tank. The holding tank was previously the treatment plant that discharged into the Kobuk River. In 1999 PHS completed a new sewage lagoon and now the sewage is pumped approximately 5,000 to 10,000 feet, uphill to the lagoon.

In 1997 the village population was 415. The 1990 median household income was \$28,125. The First Year Report provides detailed background information on Kiana, its water and sewer system, operations, maintenance, and management.<sup>3</sup>

### Project Plan

The City of Kiana requested \$40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The city will form a partnership team with: the Maniilaq Health Association sanitarian and remote maintenance worker, RUBA and LGS staff, the PHS design engineer and construction engineer, and the ANHB project manager. Within the city, people who will work on the project include: the city administrator, water and sewer operator, city clerk, and city council.

*Utility Manager.* The city will hire a utility manager to improve operation and maintenance of the water and sewer utility.

*Parts, Maintenance and Customer Education.* The city will inventory existing parts, develop a list of critical spare parts, purchase critical spare parts, provide customer education, and identify preventive maintenance schedule.

*Billing and Collections.* The city will review the existing billing and collection system, review and select computer software, review and update record keeping, develop water and sewer user rates, develop a water and sewer user agreement and new service agreement, and develop an effective collections procedure.

*Training.* The city will identify training needs for the utility manager, identify where to get the training, and when to attend the training.

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<sup>3</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## *Phase II Community Reports*

*Village Coordination.* The city will work with the city council members, village residents, and partnership team and talk with utility managers from other villages in the region.

*Planning.* The city will conduct a water and sewer user survey, develop an annual operation plan, and ask users at the end of the year about improvements in service.

### **Project Implementation**

The project began July 1, 1997, was granted one extension and was completed September 30, 1998. The city used \$40,000 (100% of the grant award), with a community match of \$54,064.

#### **Partnership Team**

The city administrator and city clerk worked with the RMW and LGS on the application for the O&M grant. In May 1997 the RMW and LGS were in Kiana, for other projects, while the city clerk and ANHB staff developed the workplan. They answered questions on priorities and what to include in the workplan.

In October 1997 RUBA and LGS staff visited Kiana to conduct an initial utility management assessment. During the winter of 1997/98 and spring of 1998 RUBA staff worked with the utility manager on financial management. The RMW worked with the operators and utility manager to develop the preventative maintenance list.

#### **Utility Manager**

The city developed the utility manager job description and advertised it in early July. In August 1997, the city council hired the utility manager. Her first duties included review of the DCRA *Introduction to Utility Management* manual, meeting with members of the partnership team, and completing the ISER community survey.

The utility manager provided reports to the city council on utility operations. These reports included: upcoming trainings scheduled by the RMW for the operators; a listing of the current water and sewer maintenance projects; a prioritized list of projects that should be completed during the summer; and a list of utility projects that could be done anytime. Other activities carried out by the utility manager are described in the following subject areas.

At the completion of the O&M Project the city did not have the funds to continue the utility manager's position and laid off the utility manager.

#### **Billing & Collections**

In the fall of 1997, the utility manager proposed to the city council to create a payment incentive for water and sewer customers. The incentive would consist of a drawing each month. The people eligible for the drawing would be those customers who paid three consecutive months of their utility bill. The winner would receive one month of free water and sewer. At their January 1998 meeting the city council decided not to adopt the incentive.

In October 1997, the RUBA staff assisted the utility manager with setting up the new computer and developing billing spreadsheets. The utility manager used these

spreadsheets to send out utility bills and found they worked well. RUBA staff also worked with the city administrator to improve the operations of the city financial accounting on Quicken software and recommended that the city obtain a newer version of the software. By December 1998, the city used QuickBooks Pro accounting software.

The utility management assessment found that between 1989 and 1996 the city water and sewer expenditures exceeded revenues seven out of eight years. It had been two years since the last water and sewer rate review.

### **Training**

In May 1997, the city administrator and city clerk attended the workshop sponsored by Maniilaq and DCRA “Introduction to Utility Management” in Kotzebue. They attended the training the week before the city clerk worked with ANHB staff to develop the O&M Project workplan. The city clerk used the information she learned at the workshop to identify the city’s needs and prioritize the tasks for the workplan. In May 1998, the utility manager attended the workshop sponsored by Maniilaq and DCRA “Introduction to Utility Management” in Kotzebue. In May 1999, the city administrator to attended the same utility management training.

### **Planning**

In the fall of 1997, the utility manager, operator and RMW developed a preventive maintenance list. During the winter of 1997/98 the utility manager is reported to have developed a water and sewer user survey. She reported completing the user opinion survey. However, the utility manager was unable to prepare a summary of the results prior to the end of the project.

### **Turnover**

The City of Kiana had four city administrators from January 1997 to June 1999. The first city administrator wrote the grant, while the second administrator supervised development of the workplan and the hiring of the utility manager. The third administrator was the city clerk (who developed the O&M grant workplan) elevated to acting city administrator until the fourth city administrator was hired in May 1998. During the project there were two city clerks. Both operators at the start of the project quit during the winter of 1997/98. Two new operators started working in early 1998. One of the newly hired operators had worked as the operator in 1995/96.

### **Parts and Supplies**

During the fall of 1997 the operators started working on an inventory of existing parts. After the operator resigned the next operator found parts that were left off of the first inventory. During the winter of 1997/98 the city purchased parts and supplies. The record does not indicate what types of parts were purchased.

### **Maintenance**

During the winter of 1997/98, the utility manager started a list of water and sewer projects. This list was given to the operators and city council. It was for setting priorities for the operators work schedule and report on what was accomplished. One of the

practices in Kiana is for the operators to thaw out frozen lines (with city funds) that, according to ordinance, are the homeowner's responsibility. In the spring of 1999, the operator repaired the boiler in the water treatment plant.

### **Project Outcomes**

The City of Kiana worked on all of the workplan tasks and completed six of the seven tasks. The project outcomes include:

- Hired a utility manager;
- Improved the computer billing system;
- Worked with RUBA and RMW staff to improve utility operations;
- Attended utility management training; and
- Provided utility management reports to the city council.

The utility manager started all of the tasks defined in the workplan. Based on information in the record it is unclear whether the utility manager completed the user opinion survey or the user rate survey. The turnover in the city administrator position affected consistency in supervision of the utility staff to ensure the workplan tasks were carried out. The utility manager proposed to the city council an approach to improve collections found successful in other villages. The city council, however, did not approve her recommendation. The turnover in water and sewer operators affected completion of the parts inventory.

Kiana has one of the oldest rural water systems in Alaska. The project provided the funding to improve management of the water and sewer utility. The activities consisted of developing a prioritized list of repairs to conduct during the summer season, providing customers with a list of "Do's and Don'ts to avoid winter freeze-ups", and developing a parts inventory.

The work by the utility manager, RUBA and current city administrator has led to improved billing and collections.

The city historically has fixed water and sewer line freeze-ups that, by the city's own ordinances, are the homeowners responsibility. Because of the age of the system this is a substantial amount of the operator's time and drains the city water and sewer budget. The current city administrator is starting to enforce the city ordinances, it is too early to tell if the city council and customers are willing to change the historic pattern.

## Research Questions

The table summarizes the outcome indicators for Kiana. As a result of the O&M Project the O&M resources improved; though it is unclear how much. The condition of the facilities improved due to PHS finishing a new sewage lagoon and the operator repairing a boiler. The collections and financial management improved during the period due to the work on the accounting system by the utility manager, RUBA staff and city administrator. Utility management improved due to the efforts of the utility manager and RUBA staff. The efforts by the city and several agencies lead to an overall increase in five of the twelve indicators.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF KIANA</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	No change in operator hours during period.
Percentage of Scheduled Maintenance Activities	Decreased	No	Operator turnover; new operators spent less time on scheduled maintenance.
O&M Policies, Procedures or Planning	About the Same	Insufficient Information	There is some work on preventative maintenance lists, no substantial changes.
Operator Skills	Decreased	No	Operator turnover during the period. New operators are less experienced.
O&M Resources (Tools, Parts & Supplies)	About the Same	Partially	The grant provided for parts purchases; however, the operators & RMW indicate no change.
Condition of the Facilities	Improved	Partially	PHS finished a new sewage lagoon. Operator fixed a boiler.
<i>Financial and Utility Management</i>			
Collections	Increased	Partially	The utility manager and RUBA worked to improve billing, new city administrator improved billing; it appears collections increased.
Cost Efficiency	Unable to Determine	Insufficient Information	Operating costs may have increased due to pumping sewage to the lagoon (instead of river effluent).
Financial Management	Improved	Significantly	RUBA staff, utility manager and new city administrator improved accounting software.
Utility Management	Improved	Partially	Utility manager and RUBA staff improved reporting to city council.
Utility Policies, Procedures or Planning	About the Same	Not Accomplished	There is work in this area, overall it appears about the same.
Community Involvement	About the Same	Not Accomplished	There is no apparent change in customers or council support.

## *Phase II Community Reports*

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Funding that could be used for utility operation and maintenance;  
Started tracking maintenance activities;  
Attended utility management training; and  
Support provided by RUBA, LGS and RMW.

### **Long-term Effects**

There are four areas we believe are important for the long-term success of this project.

First, the city needs to have consistent administration. The turnover of city administrators affected the implementation and completion of the O&M Project. If this turnover continues it will affect the consistent operation and maintenance of the utility.

Second, it is unclear if the city council, and the customers, will support improvement in collections and raising utility rates to cover utility costs.

Third, the city recently began developing a master plan for the water system. Replacement of the water lines and water treatment plant will reduce operation and maintenance costs due to an old system.

Fourth, it is unclear if PHS or the city will address replacement of the sewer lines. These lines are old and cause high maintenance costs. Replacement will lower the city's maintenance costs.\*

\*While the project record showed little evidence of long term improvement, more recent information from the city administrator reports, "revenue has risen dramatically by simply enforcing the related ordinances from upwards of fifteen third notices to delinquent customers, the number has dropped to about two second notices a month." She also reports strong council and community support for continued improvement in collections and system maintenance. She credits the O&M demonstration project with jump starting these improvements.

(Letter from Hazel Apok to Nina Miller, December 18, 1999)

## Kongiganak

Kongiganak is a Yupik village located on the west shore of Kuskokwim Bay, west of the mouth of the Kuskokwim River. The villagers live predominately a subsistence lifestyle. There is one form of government: the Kongiganak Traditional Council, a federally recognized tribe. The tribe operates the water and sewer facilities.

Treated surface water is available at the washeteria. For drinking most residents use rain catchments during the summer and melt ice in the winter. Sewage is handled by residents who haul honeybuckets themselves, to a treatment plant at the sewage lagoon (there are no collection bins). Homes are currently not plumbed, but a piped system is planned.

In 1997 the village population was 349. The 1990 median household income was \$33,250. The First Year Report provides detailed background information on Kongiganak, its water and sewer system, operations, maintenance, and management.<sup>4</sup>

### Project Plan

The Kongiganak Traditional Council requested \$40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The traditional council will form an ongoing sanitation committee comprised of seven community members and young people whose duty will be to educate utility users on the costs of operating and maintaining the utility. Other partners will include: the Kongiganak Traditional Council personnel, Alaska Native Health Board staff, utility operators, Village Safe Water, Dept. of Community and Regional Affairs, Association of Village Council Presidents, Yukon Kuskokwim Health Corporation (RMW), the school and other interested community members.

*Sanitation Committee.* The traditional council will form a sanitation committee who will meet two to three time per month, hold fundraisers and work with an advisor to oversee the project.

*Customer Education.* The traditional council will provide information to community members and utility users on costs associated with operation and maintenance of the utility through monthly meetings, radio announcements, house-to-house visits, and fliers.

*Training.* The traditional council will provide utility management training on the current and planned system to at least two traditional council officials, assist utility operators and the alternate operator to complete requirements for certification, and provide on-the-job training to alternate operators.

*Utility Management.* The traditional council will establish a user manual for the current system and the planned piped water and sewer system. The manual will provide the community and utility users what they need to know for an understanding of the system, the proper care, and basic maintenance and preventive measures.

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<sup>4</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## *Phase II Community Reports*

*Parts & Supplies.* The traditional council will ask the operator to complete a parts inventory to assure that all the necessary parts are on hand.

### **Project Implementation**

The project began November 1, 1997, was granted two extensions and was completed April 30, 1999. The traditional council used \$40,000 (100% of the grant award), with a community match of \$15,860.

### **Partnership Team**

It took four months to develop the workplan (from July to November 1997). One of the main reasons for the longer than usual period for workplan development, was the tribal administrators' belief that the young people who would be the members of the sanitation committee needed to participate in the development of the workplan. During this period the ANHB staff and the tribal administrator talked several times by phone about the contrasting need of involving people in workplan development and the need to finalize the workplan to get on with the work. As fall approached the tribal administrator was traveling a fair amount so the ANHB staff worked with the temporary tribal administrator to complete the workplan.

Once the workplan was completed the tribal council hired an O&M Project advisor to coordinate the sanitation committee and carry out the workplan tasks. Soon after starting work during the winter of 1997/1998, the O&M Project advisor mailed the workplan to partnership team members, specifically the agencies, AVCP, YKHC, VSW, DCRA and ANHB. He asked for their assistance with carrying out the workplan.

During project implementation the O&M Project advisor worked with ANHB staff and to a lesser extent with VSW engineers. RUBA staff and an accounting consultant were working within the village during this period; however, it is not known to what extent they helped with the O&M Project.

### **Sanitation Committee**

The tribal council selected five young members of the community for the sanitation committee. The committee worked with the O&M Project adviser who supervised their activities, set up meetings, wrote quarterly reports and coordinated development of the manual (see customer education below).

By April 1998 the committee had met three times to organize and complete the workplan. During the summer of 1998 the committee met twice in May and once in June and July. ISER does not have information on how often it met in the fall and winter.

The sanitation committee hosted several fundraisers to raise money for its operations. They hosted a basketball mini-tournament in April, held a fundraiser in the Salmonberry festival during the summer, and hosted a basketball tournament in January 1999.

### **Customer Education**

The sanitation committee developed information on the utility to present at the traditional council meetings. The council, however, was meeting on a "on call" basis. The

lack of scheduled council meetings made it more difficult to distribute utility information. When the council did meet, the committee asked utility customers to make timely water & sewer payments. The fundraisers helped raise awareness about the utility operations among the community. Based on the record, it is not known if information sheets were handed out during the fundraisers. The committee drafted a notice for distribution to utility customers.

The O&M project advisor worked with the sanitation committee to develop a user's manual for the honeybucket haul utility. The manual provided "specific guidelines, procedures and objectives in educating the community of the Sewer Facility System."<sup>5</sup> The brevity of the manual made it easy to distribute, post and remember. During the customer survey (see planning below) residents were asked if they had received a manual. The O&M grant project advisor and two committee members provided user education during the customer survey. The user manual for the piped sewer system was postponed due to a one-year construction delay.

### **Planning**

One of the projects to come from the sanitation committee was a community survey on sanitation. The survey was developed in November 1998 and was conducted between January 11- 15, 1999. The O&M grant project advisor and two members of the sanitation committee walked door-to-door asking resident's twelve questions. In a presentation of the results to the Kongiganak Traditional Council the O&M Project advisor wrote,

*The reason why I did the survey questions is that this community needed all the information on how it works on operation of the system, their answers to my questions, and concerns or complaints about the current system.*

*As we all did the survey, it looks like the community started to understand why we are working on the current project. (A new sewer system.) If we keep communicating, the community would know all the information and understand all the work(ing)s of the subject.<sup>6</sup>*

The O&M Project advisor then described eight complaints from the community about the current facilities and ideas on what to do to take care of these problems.

During the survey the O&M Project advisor and the sanitation committee members answered questions the residents had about the current facilities. They provided an explanation of the Phase II of the village sanitation master plan to upgrade the facilities to household flushing toilets. This helped the community understand what was going on and their role in making the system successful in the future.

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<sup>5</sup> *User's Manual for the Sewer Facility System*, Kongiganak, Alaska dated March 1998.

<sup>6</sup> Letter from Jesse C. Daniel, O&M Project Advisor, to KTC Members dated January 19, 1999.

## **Training**

A council member and sanitation committee member attended the training presented by Yukon Kuskokwim Health Corporation and DCRA, "Introduction to Utility Management" in Bethel. The washeteria operator attended boiler repair training. Wastewater operator passed OIT certification.

## **Turnover**

From the development of the application in January of 1997 to project completion in the summer of 1999 several of the position keys to the project changed personnel. The tribal administrator who wrote the grant application in January 1997 and started developing the workplan with ANHB in July 1997 passed the O&M Project on to another tribal council staff person in November 1997. The O&M Project advisor became the tribal administrator in April 1998 and was replaced that month by a new O&M Project advisor hired by the tribal council. In November 1998 the third O&M Project advisor replaced the second advisor. The third O&M project advisor stayed with the project till the end and completed the tasks. The turnover in staff did affect the rate at which activities were completed, but not the overall completion of the tasks.

## **Parts and Supplies**

One of the last tasks to be completed was the parts inventory. The community quarterly reports describe the inventory starting in July 1998 and the operator completed the inventory in November 1998. It was not recorded whether a priority for replacement parts was identified during the inventory.

## **Project Outcomes**

The Kongiganak Traditional Council completed five of the six-workplan tasks. The project outcomes include:

- Formed and operated a sanitation committee made of young community members;
- Conducted customer survey and reported the results to the council;
- Attended utility management training;
- Attended operator training; and
- Developed and provided a sewage facility user manual to customers.

In January 1997 the tribal administrator requested the O&M Project to prepare the village for the new piped sewer system. The concept for the sanitation committee was to involve young people in the utility operations so they would gain a better appreciation of the utility. It is unknown to what extent working on the sanitation committee helped the young people learn about the utility (because they were not asked during the data collection efforts). The workplan called for committee meetings two or three a month. The committee did not meet this often.

The fundraisers were for the purpose of raising committee operating funds for the fall of 1997 and winter 1998. The sanitation committee provided a forum for young people to work together and learn about the water and sewer utility. The committee members earned money for working at fundraisers and conducting the survey. These fundraisers did not raise funds, in fact, cost more than they made.

The parts inventory is reported to have completed the parts inventory after there was a change in operators

### **Research Questions**

The table summarizes the outcome indicators for Kongiganak. As a result of the O&M Project the operator skills improved due to the grant partially paying for training expenses. The utility policies improved due to the user manual developed by the sanitation committee. The community involvement increased due to the door-to-door customer survey carried out by the sanitation committee. The efforts by the tribe and several agencies lead to an overall increase in eight of the twelve indicators.

The factors we believe contributed to the tribe's capacity to accomplish the project outcomes include:

Staff desired to include youth in customer education about the water and sewer facilities; and

Staff committed to carrying out the workplan even though there was a delay with construction of the new facilities.

### **Long-term Effects**

Because of the delay in construction of the new sewer system, several of the workplan tasks were carried out for the honey bucket sewage system. While this provided benefit in terms of the existing sewage system, it is unclear how much this will carry over to the new system once construction is finished.

The O&M Project advisor and the sanitation committees provided some of the key successes of this grant. Door-to-door contact brought about many of the changes of increasing customer awareness. However, because of the turnover (among the project advisor and committee members) it is unclear what the long-term benefit of the sanitation committee is. Because it was unable to generate funds to continue its existence after the grant period, the committee was not sustainable.

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OUTCOME INDICATORS FOR THE VILLAGE OF KONGIGANAK			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Decreased	No	For one operator his hours decreased, unable to determine for the other.
Percentage of Scheduled Maintenance Activities	Decreased	No	Hours for maintenance decreased as operator's hours decreased.
O&M Policies, Procedures or Planning	Improved	No	New operator completed tasks such as filling out checklists that have been neglected in the past.
Operator Skills	Increased	Partially	Operator passed OIT in wastewater collection; O&M grant provided funding.
O&M Resources (Tools, Parts & Supplies)	About the Same	Not Accomplished	Operators comment parts are purchased when they need them.
Condition of the Facilities	About the Same	Insufficient Information	Facilities are thought to be in similar condition.
<i>Financial and Utility Management</i>			
Collections	Increased	No	A 'zero balance' raffle and customer education appears to have increased collections.
Cost Efficiency	Increased	No	The accounting system improvements by bookkeeper and consultant.
Financial Management	Improved	No	Consultant came to town to conduct review and training.
Utility Management	Improved	No	Consultant came to work with tribal staff.
Utility Policies, Procedures or Planning	Improved	Significantly	Developed user's manual and customer survey.
Community Involvement	Increased	Significantly	Customer education and customer survey helped increase awareness and support.

## Koyukuk

Koyukuk is an Athabascan village located on the Yukon River near the confluence with the Koyukuk River. The villagers live predominately a subsistence lifestyle, depending on salmon, whitefish, moose, waterfowl and berries. There are two forms of government: the City of Koyukuk, a municipal second class city, and the Koyukuk Native Village, a federally recognized tribe. The city operates the water and sewer facilities.

Water is pumped from a well to a water treatment plant in the washeteria. Residents haul water from the washeteria to their homes. Residents haul honeybuckets to the lagoon.

In 1997 the village population was 126. The 1990 median household income was \$13,929. The First Year Report provides detailed background information on Koyukuk, its water and sewer system, operations, maintenance, and management.<sup>7</sup>

### Project Plan

The City of Koyukuk requested \$ 40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The city will form a partnership team with: the Tanana Chiefs Conference RMW, and the ANHB project manager. Within the City, people who will work on the project include: the Utility Manager, operators, City Administrator, and City Council.

*Utility Manager.* The city will hire and train a utility manager, purchase a new computer system, and establish an effective billing and collections system;

*Training.* The city will provide training to the water plant operator, utility manager and city council on issues related to the successful management of the water and sewer utilities;

*Customer Education.* The city will hold meetings and supply written information to community members and utility users about their role in supporting the system through proper use and maintenance of utility;

*Training.* The city will provide the utility operator and alternate operators with appropriate training with assistance from remote maintenance workers; and

*Parts and Supplies.* The city will complete the replacement parts inventory.

### Project Implementation

The project began August 1, 1997 and was completed July 31, 1998. The city used \$40,000 (100% of the grant award), with a community match of \$20,080.

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<sup>7</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Partnership Team**

ANHB staff met with the city council during his visit to Koyukuk in May 1997. They discussed the nature of the O&M Project, what the funds were to be used for and several possible tasks the city could include in their project workplan. The previous city administrator had written the O&M Project grant application. After the ANHB staff visit, the city staff finished the workplan, the city council passed a supporting resolution and the workplan was forwarded to ANHB.

During the fall of 1997, work on the O&M Project progressed slowly. During the winter of 1997/98, PHS announced that Koyukuk was the recipient of a small flush haul system (12-15 homes). With this in mind RUBA staff worked closely with the city administrator and utility manager (see below for specific examples). The RMW visited Koyukuk several times to work with the operators.

## **Utility Manager**

In the fall of 1997, the city advertised for a utility manager. The main duties of the utility manager were to attend to the laundromat. No one applied for the position until January 1998. The city council hired a utility manager that same month. The utility manager began learning about the manager's duties and responsibilities. She made some progress on recordkeeping. She resigned in March and a replacement was hired in April. The new utility manager learned the paperwork from the RUBA staff during a May visit. The manager collected data on the washeteria on a spreadsheet furnished by the RMW.

## **Financial Management**

The city purchased a computer with O&M Project funds during the fall/winter 1997. In March 1998, during a village visit RUBA staff worked with city staff to load the financial software Quicken 7 on the computer. The new city administrator tightened some of the city's internal control and cash count procedures. In May 1998, during a village visit RUBA staff removed the Quicken software because it did not conform to the General Fund Accounting and installed QuickBooks software.

In the fall of 1998, the washeteria continued to have expenses exceed revenues. The RMW reported it was common for the washeteria to operate in a financial loss in the fall. By the spring of 1999, the city administrator had improved financial management by centralizing all laundromat records, purchasing and payroll through the administrator.

## **Training**

In December 1997, the city administrator and the person who was hired as the utility manager in January 1998 attended the workshop sponsored by TCC and DCRA "Introduction to Utility Management" in Fairbanks. RUBA staff provided "over-the-shoulder" training during visits in March, May and November 1998. In the spring of 1998 the utility manager attended and passed an OIT course in Minto.

The RMW visited in February and March 1998 to conduct hands on training with operators. Both operators attended basic electrical training and operator training in February 1998.

### **Customer Education**

The city administrator posted notices and signs on use of the washeteria. Utility use was discussed during city council meetings. The record does not include any information on the success or outcome from the customer education.

### **Turnover**

There was substantial turnover throughout this project. The city administrator's position turned over three times. In January 1998 the city council hired a second operator.

The utility manager position turned over twice. The first utility manager was hired in January 1998. In March she resigned and a new utility manager was hired in April. In the fall of 1998 the second utility manager resigned.

### **Parts and Supplies**

The record does not contain information on whether the parts inventory was completed.

## **Project Outcomes**

The City of Koyukuk worked on five of the six workplan tasks. The project outcomes include:

- Hired a utility manager;
- Improved the billing system;
- Provided information to the customers; and
- Provided training for operators with the RMW.

The turnover in staff affected the completion of each task. It also affected the ability of the city administration to create an institutional capacity for operation and maintenance of the water and sewer utility. The small population of Koyukuk means there is a smaller community of people who potentially have the skills or interest required for operating and maintaining the utility.

During the O&M Project period the record indicates minimal improvement in operation and maintenance. After the project was completed, RUBA staff reported improvements in the utility management during 1999.

## **Research Questions**

The table summarizes the outcome indicators for Koyukuk. The operator skills increased due to training and the RMW over-the-shoulder training. The collections and cost efficiency improved, although very slightly, due to efforts by RUBA and the utility manager hired by the O&M Project funds. The utility policies improved slightly due to efforts to conduct a customer survey and improve the ordinances. The efforts by the city and several agencies lead to an overall increase in four of the twelve indicators.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

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Funds that could be used for utility operation and maintenance; and Support provided by RUBA, LGS and RMW.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF KOYUKUK</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Decreased	No	Operator worked 25 hrs/wk in 1997 and 20 hrs/wk in 1999.
Percentage of Scheduled Maintenance Activities	Decreased	No	Operator hours decreased, parts availability decreased.
O&M Policies, Procedures or Planning	About the Same	Not Accomplished	No change during period.
Operator Skills	About the Same	Partially	Operator took training put did not pass the test.
O&M Resources (Tools, Parts & Supplies)	Decreased	No	The availability of parts decreases, with less city funds spent on replacement parts.
Condition of the Facilities	Declined	No	
<i>Financial and Utility Management</i>			
Collections	About the Same	Partially	The trend is for improvement from a low base rate.
Cost Efficiency	About the Same	Partially	Purchasing and payroll are handled better now.
Financial Management	Improved	No	RUBA staff assisted with accounting and filing reports.
Utility Management	About the Same	Not Accomplished	
Utility Policies, Procedures or Planning	About the Same	Partially	Community leaders are working on ordinance and door-to-door survey.
Community Involvement	About the Same	Not Accomplished	

### **Long-term Effects**

The turnover during the O&M Project is one indication of fundamental community development issues that need to be addressed to ensure improved operation and maintenance of a water and sewer system. Despite the well-intentioned efforts of all involved during the O&M Project, from the record it appears the project had minimal impact on the community capacity to improve management of its water and sewer utility. Most of the improvements came a year after the O&M Project was completed. It is difficult to say what caused the improvements. Some possibilities include: a delayed result of the O&M Project, the change in city personnel and council, the residents seeing the PHS flush haul project started in the village, or RUBA and RMW perseverance. The improvements are probably due to a combination of all these factors.

In the summer of 1999, Koyukuk was on the path to improvement of utility management. From the record, it appears the city will need active assistance to continue its process of internalizing the community capacity to operate their utilities.

## Mekoryuk

Mekoryuk is a Cup'ik Eskimo village located at the mouth of Shoal Bay on the north shore of Nunivak Island. The villagers live predominately a subsistence lifestyle, depending on salmon, reindeer, and seal. There are two forms of government: the City of Mekoryuk, a municipal second class city, and the Native Village of Mekoryuk, a federally recognized tribe. The city operates the water and sewer facilities.

Water is pumped from a well, treated and stored in a 120,000-gallon storage tank. Households haul water from five watering points in the village. The school has its own well. A flush haul system is currently being implemented, with approximately 75% of the homes being served by fall of 1998. There is funding for the remainder of the homes. The washeteria has piped gray water disposal to the lagoon.

In 1997 the village population was 192. The 1990 median household income was \$ 14,792. The First Year Report provides detailed background information on Mekoryuk its water and sewer system, operations, maintenance, and management.<sup>8</sup>

### Project Plan

The City of Mekoryuk requested \$37,780 to carry out a workplan with the following tasks:

*Utility Manager.* The city will hire an administrator to assist VSW with construction project management, fuel ordering, budget set-up, and management of the utility.

*Office Equipment.* The city will purchase a computer, inkjet printer, network card for current dot-matrix printer, backup storage device, dust covers, and other miscellaneous equipment for the administrator's use.

*Training.* The city will provide utility management training for the administrator; accounting or billing software class for the clerk; and flush/haul unit maintenance, water treatment or similar classes for the haul operator, water operator and their alternates.

*Parts & Supplies.* The city will inventory the spare parts and tools and then create a list of needed items.

*Customer Education.* The city will inform customers of what their water and sewer payment pays for by sending information with bills, publishing a newsletter, and other methods. The city will investigate the possibility of scheduled sewer pickups as a method to decrease customer costs.

*Financial Management.* The city will continue to work with the RUBA program to refine and implement better management practices.

*Utility Management.* The city will research different internet providers to see which offers the best price and service options

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<sup>8</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Project Implementation**

The project began September 1, 1997, was granted one extension and was closed out November 30, 1998. The city used \$26,193 (71% of the grant award), with a community match of \$17,221.

### **Partnership Team**

Prior to the start of the O&M Project, RUBA staff and the VSW engineer were actively involved with the city administration to improve financial management and install flush tank haul units in the city. The RUBA staff worked with the mayor to submit the application for the O&M project. Once the grant was awarded to Mekoryuk, RUBA staff helped develop the workplan. As the project got underway in the fall of 1997, ANHB, VSW and RUBA staff coordinated to ensure the tasks that were ineligible under one source of funding, yet eligible under another, were covered in the O&M Project workplan or other agency funding. As discussion about finalizing the workplan continued there was some circular discussions among the city council leadership, city staff and agencies about final workplan details, leading to some miscommunication and delay in starting the project.

During the winter of 1997/98 and into the spring of 1998 the city, RUBA, VSW and ANHB staff continued their discussions on how best to use the O&M Project funds to assist the city with improving financial and utility management.

### **Utility Manager**

The city council hired an administrator in September 1997 for the city with broader duties than a utility manager. The administrator immediately began working with VSW on the flush tank haul system. The city administrator position had been vacant for several years. During the fall of 1997 the city clerk and city administrator worked on defining the roles and responsibilities of each position.

In the fall of 1997 the city administrator helped conduct a household survey for selecting the homes for the 20 flush tank haul units that fall. Through the winter of 1997/98 and into the spring of 1998 the city administrator worked on budget issues with RUBA staff. He also handled the day-to-day operations of the city.

### **Utility Management**

In the spring of 1998 the city clerk began sending numbered utility invoices. This was in response to some customer's complaints about double billing. The city clerks, despite the turnover (see turnover below), slowly shifted the utility billing from the Mac to PC.

In the fall of 1998 the city administrator answered calls from city and tribal staff from several villages who wanted to find out Mekoryuk's experience with the flush tank haul units. The city administrator, contractor, and VSW engineer discussed the idea of hosting a workshop in Mekoryuk to show the units. The record does not show whether the workshop took place or not.

### **Office Equipment**

The city purchased two PC-based computers, one for the city administrator and one for the city clerk. RUBA staff helped with setting up the computers and training. The funds for the Internet connection were reallocated to the purchase of computer equipment.

### **Training**

In January 1998 RUBA staff provided training in the village for the city and IRA councils and city staff on budgeting, financial reporting and the roles and responsibilities of council members. In April 1998 the city administrator and city clerk attended the training sponsored by Yukon Kuskokwim Health Corporation and DCRA, "Introduction to Utility Management" in Bethel.

The washeteria/water plant operator attended a water distribution Level I training and passed the test. The record indicates there was additional operator training but does not provide details.

### **Parts & Supplies**

At the start of the project the tools, equipment and spare parts were not kept in one central location. The city reported completing an inventory of parts and equipment in September 1997. RUBA staff worked with the city staff to order parts. By the end of the project no parts were purchased.

### **Customer Education**

In the fall of 1997 the VSW engineer provided training for homeowners, administrators and operators. He addressed the construction and maintenance of the flush tank haul system. He also covered environmental impacts, health concerns and solutions. During the winter of 1997/98 the city administrator reported being stopped on the street and asked by residents who was responsible for maintaining the flush tank haul system. Later that winter there were public meetings to discuss issues concerning costs, who is responsible for what and provide an opportunity for the public to voice their feelings about the project. Information was also distributed to the public through cable TV. No newsletter was ever developed.

### **Financial Management**

The city council created and passed a balanced budget for the fiscal year starting in July 1997. During training in January 1998 RUBA staff explained to the city council, using the November and December 1997 financial statements, the washeteria earned money and the flush tank haul system lost money. This meant the washeteria subsidized the flush tank haul system.

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Because of the turnover of city clerks there were periods between September 1997 and November 1998 when the financial recordkeeping was not current. In June 1998 the city council did not pass a budget prior to council members heading to fish camp for the summer. In the fall the city council passed a budget with the flush tank haul system revenues covering approximately 50% of the costs, and the washeteria revenues did not cover the difference. The entire budget was approximately \$75,000 in the red, without funding for the city administrator (whose funding under the O&M Project ran out in November 1998).

### **Turnover**

In the year and a half prior to the ANHB project, there were eight city clerks, only three stayed long enough to receive training from the RUBA staff on accounting procedures. During the project period, the city clerk resigned in February 1998 and was replaced in March. Also in February 1998, the operator who had worked in the washeteria for several years resigned. Turnover continued through the summer and fall of 1998: the city clerk position turned over four more times, one of the operator positions turned over once more and the other position turned over three times.

### **Project Outcomes**

The City of Mekoryuk worked on all of the tasks and completed five of the seven workplan tasks. The project outcomes include:

- Hired a city administrator,
- Coordinated installation of flush tank haul units,
- Purchased computers for city staff,
- Attended utility management training, and
- Worked with RUBA staff to improve financial management.

The city administrator, hired by the O&M Project funds, coordinated installation of the new flush tank haul units with the residents, contractor and VSW. Later in the project period he became so busy with city affairs he could not complete all the utility management work. The high turnover in the city clerk position lead to inconsistent management of the city and utility financial bookkeeping. Despite this, apparently the collection rates for flush tank haul and washeteria remained high. By the end of the project the city did not find, nor develop, funding to pay the administrators salary once the O&M project funding ended.

Mekoryuk is the only Phase II community that did not have partnership team as a work task in the workplan. Even without an explicit task in the workplan the city and agencies talked fairly often and coordinated activities.

## Research Questions

The table summarizes the outcome indicators for Mekoryuk. The operator skills increased due to training as a result of the O&M Project. The O&M Project assisted the city administrator (by funding his position) with maintaining utility management capability despite high staff turnover. Community involvement increased due to the city administrator being available to answer questions individually and at a community meeting. The efforts by the city and several agencies lead to an overall increase in six of the twelve indicators.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF MEKORYUK</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Increased	No	The washeteria operator hours increased.
Percentage of Scheduled Maintenance Activities	Increased	No	The washeteria operator spent more time on maintenance.
O&M Policies, Procedures or Planning	Increased	Partially	Contractor for Flush Tank Haul units supplied O&M materials.
Operator Skills	Increased	Partially	Operators attended training, some passed certification tests.
O&M Resources (Tools, Parts & Supplies)	About the Same	No	The inventory was completed, however the parts availability did not change significantly.
Condition of the Facilities	Improved	No	Contractor installed flush tank haul units in homes.
<i>Financial and Utility Management</i>			
Collections	About the Same	No	Customers continue their high rate of payment of utility bills.
Cost Efficiency	Decreased	Insufficient Information	The city budget is approved with deficit.
Financial Management	Declined	No	City clerks, city administrator and RUBA work to improve, however, staff turnover affected city capability.
Utility Management	About the Same	Partially	Staff turnover affects continuity, administrator works to maintain same level capability.
Utility Policies, Procedures or Planning	About the Same	No	RUBA provided city administrator with ordinances, no substantial work carried out.
Community Involvement	Increased	Partially	Customers ask questions, city staff answered them at public meeting or on cable TV.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Funds that could be used for utility operation and maintenance; and  
Support provided by RUBA, VSW and ANHB staff.

### **Long term Effects**

Mekoryuk received short-term benefit from the O&M Project in terms of staff salary to aid in the installation of the flush tank haul system. From the record it is unclear if the short-term benefit the funds provided the city were turned into long-term structural changes in the way the city operates. The city used the O&M Project funds to hire a city administrator, who was needed to ensure, smooth operations of the city while installation of the flush tank haul system. However, no replacement funds were found to maintain the administrator after the O&M Project finished.

## Napaskiak

Napaskiak is a traditional Yupik village located on the east bank of the Kuskokwim River, along the Napaskiak Slough, seven miles southeast of Bethel. The villagers live a predominately subsistence lifestyle, depending on fishing. There are two forms of government: the City of Napaskiak, a municipal second class city, and the Native Village of Napaskiak, a federally recognized tribe.

At the start of the project the city and tribe had different responsibilities for the management, operation and maintenance of rural sanitation facilities in Napaskiak. The city operated the honey bucket haul system, the collection of solid waste and the maintenance of the solid waste disposal site. The tribe maintained the washeteria and watering points. The city and tribe jointly maintained the water plant for the watering points.

Residents haul treated water from one of two watering points. A few homes have tanks with running water for the kitchen, very few have complete plumbing. Honeybuckets are disposed of at the sewage lagoon. The school operates its own well and treatment system. The community has requested funds to develop a sewerage tank haul demonstration project for 5 to 10 homes. The village occasionally experiences water shortages.

In 1997 the village population was 399. The 1990 median household income was \$18, 750. The First Year Report provides detailed background information on Napaskiak, its water and sewer system, operations, maintenance, and management.<sup>9</sup>

### Project Plan

The Napaskiak Tribal Council requested \$40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The Napaskiak Tribal Council will form a partnership team with: the City of Napaskiak, the DCRA Rural Utility Business Advisor, the Yukon Kuskokwim Health Corporation (YKHC), and David Nairne & Associates.

*Facility Improvement.* The tribal council will purchase a haul unit and parts inventory.

*Utility Management.* The tribal council will research the cost of management, operation and maintenance of the haul unit. The tribal council will set aside a percentage of gaming revenue to establish a special operations and maintenance account.

*Training.* The tribal council will provide training for the operator on use of the new haul unit.

*City/Tribe Cooperation.* The tribal council and the city council will meet to discuss a memorandum of agreement to transfer operations and maintenance of the water and sewer to the tribe. The results of the discussions will be the tribal council assuming management of all the water and sewer facilities in Napaskiak.

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<sup>9</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

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*Revenue.* The tribal council will apply for Village Safe Water funds for developing a master plan for a flush and haul system.

### **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The tribal council used \$40,000 (100% of the grant award), with a community match of \$32,541.

### **Partnership Team**

At the start of the project some of the agency staff worked with the city and some worked with the tribe. For example, the RUBA staff worked with the city on utility management. The YKHC engineers and RMWs worked with the tribe and city. During the project the tribe and city met monthly to discuss the details of the transfer. For the most part Napaskiak completed the project working with people in their village. They selectively consulted with ANHB and YKHC staff as needed on specific issues in the transfer of utilities. There was coordination with the staff of David Nairne & Assoc. to plan the training. The YKHC RMW continued to provide assistance throughout the project.

### **Facility Improvements**

In the workplan the tribal council identified the need for an improved method for collection and disposal of sewage. The tribal council researched ways to reduce the spillage that occurs during the summer months when hauling the honeybucket bunkers from the point of collection to the sewage lagoon. The raw sewage that spilled during transport was a health threat to residents.

The U.S. Environmental Protection Agency is the funding source for the O&M Project. A condition of the EPA grant is that any piece of equipment costing more than \$5,000 must be purchased through a bid process which requests bids from three vendors. The lowest bid is the vendor selected. This process delayed arrival of the equipment. By the time the tribal council signed their grant with ANHB in July 1997, requested three bids from vendors and selected the lowest bidder it was fall. David Nairne & Assoc. was the low bidder with a six-wheel vehicle and a flush/haul tank mounted on the back. By the time the vendor was selected, the unit manufactured and shipped by airfreight winter had settled in. This delayed assembly, training and use of the equipment until the following spring.

The vacuum truck, as the unit is referred to in Napaskiak, can carry approximately 85 gallons. This is two honeybucket bins if they are about half full. Some of the boardwalks in the community will have to be repaired or replaced so they can handle the weight of the unit. Driving the vacuum truck requires being careful where the waste water line go across the boardwalk near the washeteria and on the road near the dumpsite.

### **Training**

In May 1998 staff from David Nairne & Assoc. flew to Napaskiak to show the tribal staff how to assemble the equipment. The training covered the proper use of the pumper unit. As the summer progressed the operators developed proficiency with operation of the unit and proper disposal of the waste.

### **Customer Education**

The tribal administrator noticed the honey bucket bins had debris, plastic bags and other debris that could affect the new pumper equipment. He sent letters to the households that used these bins asking them not to dispose of debris in the bins that could damage the equipment. Other times he called the householders directly, explaining the problems operators had with the debris in the bins.

### **City/Tribal Cooperation**

At the beginning of the O&M Project utility management was divided between the tribe and the city. The tribe and city developed a memorandum of agreement (MOA) to clearly outline the transfer of responsibilities for operation and maintenance of the honey bucket haul system, the washeteria, the watering point and the water treatment facility from the city to the tribe. The MOA delegated some activities from the city to the tribe, while retaining others. In some respects the tribe became a sub-contractor to the city to carry out specific activities related to operation of water and sewer facilities.

During the consolidation of operations and services the tribe monitored its costs of operating the transferred facilities. From this experience they developed an estimated total cost for operating, maintaining and managing the water and sewer systems through one year. Once the tribe collected this information it then established a certain percentage of the gaming revenue to be set aside for this purpose. This percentage is estimated to be 40%. By the end of the project the tribe was fully supporting the operation and maintenance of the water and sewer utilities with gaming revenues.

The term of the MOA was one year and expired June 30, 1998. There is no information in the record on whether the MOA was extended, revised or allowed to lapse (in which case the utilities would return to the city operation).

### **Utility Management**

As the tribe assumed the operation and maintenance of the utilities they developed a regular maintenance schedule for all the equipment. They also established some work order forms to assist with expediting purchase of parts and supplies. The work orders also serve as a record of the maintenance of the equipment.

The tribal administrator noticed that the timing of applications for VSW funding in October wasn't good because it seemed to coincide, at least in 1997, with the certification and training courses. This meant a longer lead-time the tribe had to plan for in sending the operators to training. In the 1997 funding requests, the tribal staff learned they would score higher on the agency score system because of the points given for the operator certifications. The tribe did not receive funding from the 1997 application. The record does not have information on 1998 or 1999 applications. The tribe was successful in obtaining funding from VSW for a Capital Improvement Project in SFY 2000 for Phase I sanitation Improvements.

## **Project Outcomes**

The Napaskiak Tribal Council completed all of the workplan tasks. The project outcomes include:

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Gained experience with operation and management of water & sewer utilities;  
Purchased equipment to improve collection and disposal of honeybucket waste;  
Received operator training on the new equipment; and  
Conducted customer education on disposal habits.

The O&M Project provided the tribal council with the funds to operate the water and sewer utilities as they were transferred from the city to the tribe. The O&M Project was one of several grants in the village that assisted the tribe with developing its capacity for self-governance. Most of the grant focused on the transfer of utilities from the city to the tribe. Based the information in the record this was a smooth transition.

The tribal council learned of the time lag between their full assumption of the responsibilities of managing the sanitation facilities and when the agencies recognized the success of this transition. This lag occurred during the period the tribe applied for VSW funding, the agency ranking the project and potential grant distribution. It is not clear if the agency scoring methods are sensitive to relatively quick transitions such as with Napaskiak. Specifically, how many grant cycles pass before the scoring method accounts for the consolidation of utilities.

The tribe experienced the problem of agencies providing funding in July and the grantee trying to get equipment before freeze-up. Because of mid-summer funding distribution the equipment did not become operational until the following May. This delay made it difficult to complete the grant by the June 30th completion date.

### **Research Questions**

The table summarizes the outcome indicators for Napaskiak. The condition of the facilities and O&M resources improved due to the equipment and parts purchased as part of the O&M Project. The operators skills improved due to training provided by a contractor funded by the O&M Project. There was a slight increase in the scheduled maintenance. The new six-wheeler improved the cost efficiency of the honeybucket bunker clean out. The tribal staff improved utility management by consolidating activities and improving record keeping. The efforts by the tribe and several agencies lead to an overall increase in eight of the twelve indicators.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF NAPASKIAK</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Decreased	No	It appears operators are working less hours, do not know the reason.
Percentage of Scheduled Maintenance Activities	Increased	Partially	There was a slight increase in maintenance activities.
O&M Policies, Procedures or Planning	Improved	Partially	Tribal council consolidated O&M activities, initiated work orders for maintenance.
Operator Skills	Increased	Significantly	The grant-supported training by contractor that provided operators with practical hands-on experience with the new equipment.
O&M Resources (Tools, Parts & Supplies)	Increased	Significantly	Grant provided for the purchase of parts and supplies.
Condition of the Facilities	Improved	Significantly	Grant provided for purchase of six wheeler, pumping unit and initial supplies.
<i>Financial and Utility Management</i>			
Collections	Unable to Determine	Insufficient Information	Available information differs on the change during the period
Cost Efficiency	Increased	Significantly	The six-wheeler and pumping unit makes it possible to collect honeybucket waste faster, more efficiently and with less health risk.
Financial Management	Unable to Determine	Insufficient Information	Available information differs on the change during the period.
Utility Management	Improved	Significantly	Developed a process for tracking work orders.
Utility Policies, Procedures or Planning	Unable to Determine	Insufficient Information	Insufficient information to identify change during the period.
Community Involvement	Increased	Partially	The tribe and the city worked together to improve water & sewer utility operations.

The factors we believe contributed to the tribe's capacity to accomplish the project outcomes include:

The tribe and city negotiated a "Maintenance and Operations Agreement" prior to the start of the O&M Project;  
 Focused workplan which contributed to the larger community process of the tribe assuming additional village responsibilities; and  
 Willingness to educate customers on what they can do to improve honeybucket disposal, which then lowered maintenance costs.

### **Long-term Effects**

There are three areas we believe are important for the long-term success of this project.

First, the tribal council demonstrated a forward-thinking perspective when they identified the O&M Project funds to provide 'bridging' funds for transferring the water and sewer utility from the city to the tribe. This foresight, if continued, will provide the tribe with the ability to continue improving its utility management.

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Second, the agreement between the tribal council and the city council specifies tribal operations of the utility and the city collection of revenues. The term of the agreement was for one year. For the long-term success of the utility the follow-up arrangement and the nature of dual operation of the utility needs to be addressed and simplified.

Third, the infrastructure (boardwalks, road and storage building) will need improvements so the vacuum truck can easily move around the village.

The O&M Project provided bridging funds that assisted the tribe with transferring the utilities from the city to the tribe. During this transition the tribal council improved management of the utility and identified an on-going revenue source for the utility. The new equipment reduced the spillage of honey bucket waste, which contributes to a cleaner boardwalk and is anticipated to contribute to reducing risk of illness among all community members, especially children.

The gaming revenues appear sufficient to pay for the existing water and sewer system. The health clinic does not have running water. This is something people in the village want to change. As the village improves the utilities to include running water they recognize they will have to consider user fees.

The grant contributed to consolidating utility operations within one governing organization, thus reducing the total village cost for utility management. It also played a role in the tribes' efforts to develop its capacity for self-governance. The grant assisted the tribe with developing and pursuing an application to VSW for funding. The first application to VSW was not selected, however, later ones funded by VSW.

## New Stuyahok

New Stuyahok is a Yupik village located on the west bank of the Nushagak River. The villagers live predominately a subsistence lifestyle, depending on moose, caribou, salmon, ptarmigan, ducks and geese. There are two forms of government: the City of New Stuyahok, a municipal second class city, and New Stuyahok Village Council, a federally recognized tribe. The city operates the water and sewer facilities.

The circulating water system serves about 65 of 80 homes in the community. There are three wells: a new one installed by PHS, one that is the main water supply and one that recently failed. The sewage system is gravity flow to two lift stations, which pump the effluent to a series of three parallel lagoons.

In 1997 the village population was 452. The 1990 median household income was \$12,083. The First Year Report provides detailed background information on New Stuyahok, its water and sewer system, operations, maintenance, and management.<sup>10</sup>

### Project Plan

The City of New Stuyahok requested \$40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The city will form a partnership team with: ANHB, the project manager; PHS/OEH, the sanitation staff; and the RMW. Within the city the team will include the city council, the administrator, the clerk and the water/sewer operators.

*Billing.* The city staff and water/sewer operators will be trained to use the computer for implementing the process of sending out the bills to water/sewer customers in the city. The city staff will work with IHS, OEH and Alaska Accounting Services to utilize the computer and software.

*Customer Education.* The city will start sending the first bills to all water/sewer consumers. The city staff will write a report to inform the public in a letter or handout specifying the importance of maintaining the water and sewer facilities and stating the cost of maintenance, fluoride and chlorine costs, and reasons the water samples must comply with ADEC regulations. Community education of all water/sewer customers will be conducted.

*Operator Training.* The city will send the water and sewer operators to training to further upgrade their skills. The water/sewer operators will order all the necessary parts needed for the water and sewer maintenance building. The city will send water and sewer bills to all customers.

*Collections.* The water operators will monitor payment of water and sewer customer's monthly bills to determine who is paying. The water operator will contact customers about their bills through phone calls or visits to the customer's home. The city will follow-up on the water/sewer collections.

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<sup>10</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

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- *Collections.* The city establishes a goal of collecting an estimated \$20,000 in collections annually by the final phase of the O & M project.

### **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The city used \$40,000 (100% of the grant award), with a community match of \$9,957.

### **Partnership Team**

At the start of the project there were several phone calls between LGS, ANHB, and PHS staff and the city administrator to ensure the workplan did not duplicate existing agency efforts. In the spring of 1997, PHS provided the services of a consultant to New Stuyahok for training on a computer billing system (see billing below). The O&M Project workplan also called for training on computer billing and specifically mentioned coordination with the PHS and their consultant. The ANHB staff, the city administrator and the PHS staff had a conference call to discuss the two projects and whether there was a duplication of efforts or they were complementary. They discussed ways to minimize the overlap. The city felt it needed more than the three trainings that were available from PHS. ANHB suggested the city revise the workplan to not cause overlap between funding sources.

During a mid-project site visit by ANHB staff, one of the activities consisted of the city administrator and ANHB staff calling several agency staff to discuss the project. They called RUBA staff to discuss a variety of collection methods used in other villages. The city administrator felt these calls were helpful in providing ideas on improving collections.

### **Billing**

At the start of the O&M Project the city kept billing and collection records on paper and did not send out monthly water and sewer bills to its customers. Before the O&M Project started PHS provided the city with a computer and the support services of a consultant. The consultant was budgeted to visit the village three times to train the city administrator and clerk on how to use the computer, setup a billing system and send out water and sewer bills. The consultant visited twice to provide the training. During these visits the city administrator was unable to fully take advantage of the training. During the second visit the city clerk was unable to attend. After the second visit the consultant and PHS decided not to conduct the third training. The city administrator does not remember anyone calling him to discuss the change in plans.

During the winter of 1997/1998, the city used the computer for monthly expense reports, council meeting minutes and composing letters.

In May 1998, RUBA staff visited the village to work with the city administrator to develop a computer method for sending out water & sewer bills. This consisted of setting up a computer spreadsheet billing system and tracking individual customer accounts. The RUBA staff was scheduled to return in June to continue with the training. The city administrator mentioned people would be out fishing in June and he was interested in RUBA staff coming later. In the fall RUBA staff was suppose to return to

help with the billing, but they were unable to return. By the completion of the O&M Project the city was not using the computer billing method.

### **Collections**

Before the O&M Project the usual water and sewer utility collection method consisted of the city administrator walking door-to-door to collect payments. The historic collection rates are between 10 to 25%.<sup>11</sup>

During the fall and winter of 1997 the administrator made door-to-door visits to collect water and sewer utility payments. This practice continued through 1998. The city administrator made door-to-door visits about the time disaster relief funding and permanent fund dividend checks arrived, he was able to collect some of the outstanding water and sewer bills. Water and sewer revenues increased from \$9, 026 for the period July 1997 through June 1998 to \$19,942 for the period July 1998 through January 1999. This increase included back payments. The record does not contain information on the revenues collected during the period January 1999 to June 1999. We do not know if the increase in collections was sustained.

### **Customer Education**

The city administrator noticed during his talks with community members the need to develop a flyer or information sheet describing the utility costs so they would understand why they need to pay their utility bills. During a community meeting in December 1997, the city administrator presented information on the costs of water testing and water treatment chemicals.

During a visit in June 1998, RUBA staff discussed with the city administrator the need for an education effort to help customers understand why the city needs to pay their water and sewer bills. The city administrator recognized the need for the education efforts because he expected some backlash when the customers received monthly water and sewer bills.

In August and September 1999, the city administrator had a practice of announcing over the CB; the city offices are open and encouraged people to come pay their water and sewer bills. The city administrator reported that a small percentage of people were beginning to recognize the water and sewer utility is theirs and they need to take care of it.

### **Training**

The city reported the operators attended a workshop in Anchorage in October 1997 and a week-long water and sewer training in Togiak in April 1998. In both cases the record does not indicate what kind of training the operators attended, or if any certifications were earned. The RMW did notice an increase in the operator's skill level. The RMW worked with the operators to schedule their attendance at workshops and helped them by answering their questions.

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<sup>11</sup> ANHB site visit 5/21/97 and RUBA 4<sup>th</sup> quarter FY98 Quarterly Report

## **Maintenance**

During the winter of 1997/98 the operators estimated they responded to ten frozen lines in the village. The operators noticed that the orientation and location of a house contributed to an increased chance of frozen utility lines. They noticed houses with the greatest chance of freezeup are subject to the north wind. The operators know these are problem houses and now work with the homeowners to encourage them to be aware that their homes have a greater tendency to freezeup and to modify their behavior accordingly.

## **Project Outcomes**

The City of New Stuyahok worked on all of the workplan tasks and completed five of the six tasks. The project outcomes include:

Increased water and sewer collections;  
Increased operator skills; and  
Increased community support.

The project focused on the improvement of collections through customer education, customer billing and personal requests for payments of overdue amounts. Revenues increased during the project period. The increase coincided with an influx of money that came into the village due to disaster relief funding. From the record it appears the increase in revenues was not due to an improvement in billing and collection methods. Several trainings were conducted in New Stuyahok with the city staff on improving accounting methods and skills.

At the beginning of the project there were several discussions among the partnership team on the merits of specific workplan tasks. One related to an apparent overlap of the billing task with tasks provided in another agency grant to the village. Another had to do with who was the appropriate city staff person to contact customers about their utility bills. Changes to the workplan were suggested based on the discussions.

The record indicates the city did not complete the task to develop a computerized billing system for sending monthly bills to utility customers.

## **Research Questions**

The table summarizes the outcome indicators for New Stuyahok. Operator skills increased because the O&M Project provided funding to attend training. Collections increased significantly during the project period. However, we are unable to determine if this was because of a direct linkage to O&M Project activities or an overall increase in money in the village due to fish disaster relief funding. The efforts by the city and several agencies lead to an overall increase in three of the twelve indicators. The record for New Stuyahok was limited in several instances to one or two sources, there was not a third source to confirm what the changes were related to O&M Project.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF NEW STUYAHOK</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	Operator position was spilt into two jobs to more equitably share jobs during poor fishing season.
Percentage of Scheduled Maintenance Activities	About the Same	Insufficient Information	No apparent change.
O&M Policies, Procedures or Planning	About the Same	Insufficient Information	No change during period.
Operator Skills	Increased	Significantly	Not clear what trainings were attended or if certifications increased; skills reported to have increased
O&M Resources (Tools, Parts & Supplies)	Unable to Determine	Insufficient Information	Conflicting information on whether parts increased or about the same.
Condition of the Facilities	Improved	No	PHS installed new water well.
<i>Financial and Utility Management</i>			
Collections	Increased	Partially	In second half of 1998 collections are reported to have increased significantly, may be due to availability of disaster relief funding.
Cost Efficiency	Unable to Determine	Insufficient Information	Insufficient information available.
Financial Management	About the Same	Partially	Training supplied by PHS contractor and RUBA, unclear if this improved skills or accounting system.
Utility Management	About the Same	Partially	There was work on the management, from the record no apparent improvement.
Utility Policies, Procedures or Planning	About the Same	Insufficient Information	No apparent change.
Community Involvement	Increased	Partially	Customer education improved understanding of the need to pay outstanding bills.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Funds that could be used for utility operation and maintenance;  
 Support provided by PHS, ANHB and RUBA staff; and  
 Disaster aid funding.

### **Long-term Effects**

The O&M Project provided immediate relief, helping the city pay salaries during difficult economic times that resulted from a poor fish harvest. It remains to be seen what level of collections can be sustained. From the record it appears the city did not develop the capacity for sustaining collections through a monthly utility billing and collections system. The customer education was conducted, and reported to be making a difference in customer attitude towards paying their water and sewer bills. The record is inconclusive on the long-term effect of this customer education.

We believe the O&M Project assisted New Stuyahok with avoiding a further decrease in utility service during a slow economic period. This is in contrast to the general expectation that the O&M Project was to support an increase in services.



## Noatak

Noatak is an Inupiaq village located on the north shore of the Noatak River. The villagers live predominately a subsistence lifestyle, depending on moose, caribou, chum salmon, whitefish, berries and waterfowl. There are two forms of government: the Native Village of Noatak, a federally recognized tribe, and the Northwest Arctic Borough, a regional borough. The tribe operates the water and sewer facilities.

Water is derived from the Noatak River and is treated. Groundwater wells have been unsuccessful in the past. A piped, recirculating water and sewer distribution system serves 90% of homes in Noatak. However, over half of the homes cannot use the service due to lack of plumbing. These residents haul water and honeybuckets; there is no washeteria.

In 1997 the village population was 401. The 1990 median household income was \$ 36,458. The First Year Report provides detailed background information on Noatak, its water and sewer system, operations, maintenance, and management.<sup>12</sup>

### Project Plan

The Native Village of Noatak tribal council requested \$40,000 to carry out a workplan with the following tasks:

*Partnership Team.* The Native Village of Noatak will form a partnership team with: the IRA council, utility board, administrator, water and sewer clerk, operators, Maniilaq RMW, the ANHB, DCRA and other interested parties.

*Office Equipment.* The tribal council will research, purchase and set up a computer system for billing, file management, and payroll.

*Parts and Supplies.* The tribal council will use an existing parts list developed by the RMW and purchase parts as needed and put the list of parts on the computer.

*Customer Education.* The tribal council will educate customers about the cost of operating and maintaining the water and sewer utilities, the effect of disposing of materials in the system that can cause blockage, and the homeowners responsibility for in-house plumbing repairs.

### Project Implementation

The project began July 1, 1997 and was completed June 30, 1998. The IRA council used \$40,000 (100% of the grant award), with a community match of \$81,411.

#### Partnership Team

During the project the utility manager worked with IRA staff, the LGS and RMW. Noatak is a non-RUBA community. During a visit in February 1998 the ANHB staff person helped the utility manager with updating her new computer. In August and November of 1998 the LGS provided assistance to the administrator on computer programs for utility management and utility budgets.

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<sup>12</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## *Phase II Community Reports*

The RMW worked closely with the operators to prepare for winter operations. During the maintenance repair (see maintenance below) he worked with the operators to order parts and gets repairs done.

### **Utility Board**

The IRA Council formed the utility board in 1996. The duties and powers of the board are described in tribal ordinance. As the project started in the fall of 1997 getting a quorum of the board together became difficult because members were off hunting or working on the new housing. During the winter the IRA Council treasurer became the utility board chairman. This change was intended to help improve communications between the board and IRA Council. In the spring of 1998 the IRA Council abolished the utility board due to a decrease of available funds (board members were paid to attend meetings).

### **Office Equipment**

One of the main tasks for Noatak was getting a new computer for the utility manager. The utility manager's computer would lose data at odd moments and making it difficult for her to work efficiently with the system. Another reason for the upgrade was the utility used the Macintosh operating system and the rest of the IRA office used the PC operating system. In the fall of 1997 the utility manager purchased a new computer.

### **Financial Management**

Once the new computer arrived the utility manager began transferring billing and collections information. The rate at which she could transfer information was affected by people coming into the office to pay bills or ask questions about the utility. She learned that the transfer would have gone faster if she had asked the alternate utility clerk to handle the customers while she entered the information. The ANHB staff answered questions about how to complete specific transfer processes for the billing and collections. In the summer of 1998 the utility manager ordered QuickBooks Pro software as an upgrade to the utility's accounting software and received training assistance from the LGS.

### **Parts and Supplies**

In the fall of 1997 the utility started purchasing spare parts with the O&M Project funding. When the lift station developed problems (see maintenance below) they ordered more parts. In the spring of 1998 the utility manager asked the operators to develop a list of all repairs and parts needed before the summer was over. By the end of the O&M Project the utility staff had not completed the task for moving the old utility computer to the water treatment plant to maintain a computerized list of the utility parts inventory. The record does not have information on why they were unable to complete this task.

### **Maintenance**

During the winter of 1997/1998 the utility had a very major maintenance repair. The sewage lift station downstream of the school had a pump failure. The operators removed the pump and sent it for repairs. They did not have a spare pump to replace it.

While waiting for the pump to be repaired and returned, the operators pumped sewage from the lift station into a tank then hauled it to another operating lift station for pumping to the lagoon. During the pump repair the control panel also had to be shipped out for repairs. The duration from first break to final repair was lasted approximately three months.

This repair had a major impact on the utility operations and budget. The O&M Project helped cover some of the cost of repairing the pump and control panel. Between what the grant did not cover in parts and the additional labor cost this major repair drained most of the utilities budget reserves.

### **Training**

The utility manager and her administrative assistant attended the training sponsored by Maniilaq and DCRA "Introduction to Utility Management" in Kotzebue in May 1998.

### **Customer Education**

The utility manager and the operator developed a laminated one-page flyer that reminded homeowners of things they can do for preventative maintenance. The flyer reminded the homeowner about what not to flush down the toilet, what to do to ensure pipes don't freeze, that it is the homeowners responsibility to fix all leaks inside the house and who to call if they need help. After distribution of the flyer the operators noticed they got less calls for assistance and less problems with the lift station. The utility manager found customers to be more cooperative. The utility manager and operator discovered the flyer made their jobs easier.

## **Project Outcomes**

The tribal council completed four of the five workplan tasks. The project outcomes include:

- Purchased a new computer and up-graded the accounting software;
- Responded to a major maintenance repair;
- Improved customer awareness; and
- Attended utility management training.

The new computer improved the utility manager's operations by significantly reducing the time it took her to generate monthly utility bills. Financial management continued to improve, as she became more proficient with the new accounting software.

The utility manager, operators and RMW responded to an equipment failure with the needed repairs and changes to the sewage system. The O&M Project partially funded the emergency repair. The utility had to cut costs even more; they reduced staff hours and disbanded the utility board. The workplan task for using the utility manager's old computer for parts inventory, while originally a good idea, did not work in practice.

## **Research Questions**

The table summarizes the outcome indicators for Noatak. O&M resources improved because the O&M Project provided funds to purchase parts. A computer purchased by grant funds contributed to improvement of financial and utility management. The cost efficiency improved because a grant funded customer education effort decreased maintenance calls. The efforts by the tribe and several agencies lead to an overall increase in five of the twelve indicators.

The factors we believe contributed to the tribe's capacity to accomplish the project outcomes include:

Funds that could be used for utility operation and maintenance;  
Customer education which led to a decrease in maintenance calls;  
Staff willing to enforce utility collections policy; and  
Assistance with emergency provided by RMW.

Overall, the O&M indicators declined due to a major pump failure and the resulting financial pinch. The utility would likely have declined even further, however, without the assistance of the O&M Project. We are unable to determine whether there was a net improvement in the inventory of spare parts and whether this will increase efficiency in the future.

## **Long-term Effects**

The utility manager and operators are improving their capability to operate the utility. One major equipment failure turned a small utility with reserves into a utility barely getting by financially. The indicators mask the underlying strength of the utility management. The senior operator has worked for the utility for ten years. The utility manager has worked for the utility for several years and does her job well.

The O&M grant provided \$12,000 towards parts and supplies to deal with regular maintenance and the emergency repair. If that money had not been available we believe the utility and IRA Council would have had to spend even more savings or cut costs further. The new computer and software will provide long-term benefit because the utility manager is mastering the new accounting software and has the support of the LGS when needed.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF NOATAK</b>
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Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Decreased	No	Operator hours decreased by one hour per week because of decrease in budget.
Percentage of Scheduled Maintenance Activities	Decreased	No	Decrease in operator hour's lead to decrease in maintenance activities.
O&M Policies, Procedures or Planning	About the Same	Insufficient Information	No change during period.
Operator Skills	About the Same	No	The operators gained experience, did not gain additional certifications.
O&M Resources (Tools, Parts & Supplies)	About the Same	Significantly	Parts were purchased from grant funds and many were used during the grant period.
Condition of the Facilities	Declined	No	The waste heat line is no longer working properly, increasing heating costs.
<i>Financial and Utility Management</i>			
Collections	Increased	Partially	New computer decreased the time to print utility bills, giving utility manager more time to talk with customers.
Cost Efficiency	Improved	Significantly	
Financial Management	Improved	Significantly	Purchased new computer (replaced old computer) and this increased utility manager's efficiency in billing and monthly statements.
Utility Management	Improved	Partially	Utility manager attended training for a second year and improved utility operations.
Utility Policies, Procedures or Planning	About the Same	No	Utility board was disbanded.
Community Involvement	Increased	Significantly	The utility manager developed flyers and distributed around the village and talked with customers.

## Nondalton

Nondalton is a Tanaina Indian (Athabascan and Iliamna) village located on the west shore of Six-Mile Lake, between Lake Clark and Iliamna Lake. The villagers live a predominately subsistence lifestyle, depending on salmon, trout, grayling, moose, caribou, bear, and other subsistence foods. There are three forms of government: the City of Nondalton, a municipal second class city, Nondalton Tribal Council, a federally recognized tribe, and the Lake and Peninsula Borough, a regional government. The city operates the water and sanitation facilities.

PHS constructed the original water system in 1971. The old system has some flaws. For example, the current pumps never shut-off; thus causing them to pump water 24 hours per day. An infiltration gallery at Six-Mile Lake supplies the community with treated water. There are 88,000 gallons of storage capacity. Most residences are plumbed and connected to the piped water and sewer system.

In 1997 the village population was 221. The 1990 median household income was \$21,750. The First Year Report provides detailed background information on Nondalton, its water and sewer system, operations, maintenance, and management.<sup>13</sup>

### Project Plan

The City of Nondalton requested \$35,286 to carry out a workplan with the following tasks:

*Partnership Team.* The city will form a partnership team made up of the mayor, public works director, water and sewer operator, IHS engineer, RUBA, ANHB project manager, PTI engineer, Nondalton tribal chief, American Water Works Association, Alaska Training Coalition, and Kijik Corporation.

*Facility Improvements.* The city will replace or repair water system leaks, order necessary parts and supplies, replace old-style style copper lines, maximize efficiency for service lines and hydrants, redo three hydrants and contact IHS to do a site examination of the pump wells. To carry out this maintenance the city will hire a water & sewer utility assistant operator and project laborer.

*Facility Improvements.* The city will install locking valves on all service lines.

*Customer Education.* The city will educate community members regarding costs associated with usage by conducting a community workshop, revising the do's and don'ts list and preparing two articles for local newsletters.

*Billing.* The city will update the billing system and software and provide computer and utility management training.

*Training.* The city will support training for the operator and maintenance staff by researching available training and requesting funding assistance from BBAHC, IHS or the city.

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<sup>13</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The city used \$35,286 (100% of the grant award), with a community match of \$30,575.

### **Partnership Team**

In January 1997, prior to the start of the project, the city mayor asked RUBA staff to visit the village to assist the city clerk with utility ordinances, policies and procedures. During that visit the RUBA staff suggested the ANHB O&M grants as a means to obtain funding for making major repairs to the utility. The city submitted an application, including the RUBA staff comments.

Once the city received funding they formed a task force to discuss the process for accomplishing the project and ordering parts and supplies. The task force included: the city mayor and public works director, the water and sewer operator, the IHS engineer, RUBA staff, ANHB project manager, Nondalton Tribal Council, American Water Works Association, Alaska Training Coalition and Kijik Corporation.

The task force discussed the process in which the O&M project could be easily and reasonably accomplished. This discussion created a tool they could use with future plans for the water and sewer system. (The record contains no information describing what the tool is.) Another recommendation was to study the complete system looking at how to operate and maintain it at a reasonable cost to the consumer while lowering existing maintenance costs. The city used these recommendations when they applied for a Village Safe Water Grant in early 1998. The city was awarded the grant and initiated the feasibility study. (The record contains no information describing the results of the study.)

During O&M Project implementation the city conducted the workplan tasks using people within the village. The task force formed at the beginning of the project did not meet during or after project completion to assess how well the project worked. There was some on-going communication during the O&M Project.

One of the difficulties the village had with communicating with others in their region is that the primary air transportation route is to Anchorage rather than Dillingham, the regional center. This means the IHS engineering staff working with the city is based in Anchorage, while the RMW staff is based in Dillingham. Because of the airline routes, the city has had some difficulty in getting water samples tested at the regional hospital in Dillingham, a practice of several other villages in the region.

### **Facility Improvements**

In 1997, before the project began the water plant treated approximately 72,000 gallons per day. (A city this size should be pumping between 25 to 30,000 gallons per day, based on village population and using national average of per capita water consumption.) The city believed this was mainly due to system leakage and wasteful usage. For example, inspection at one site found that the bottom half of a copper service line was broken. Additionally, some curbstops were not installed during the original construction. This is allowed for water line connections at the main line to separate and result in major leaks.

## *Phase II Community Reports*

The O&M Project provided funds to replace the old copper service lines. The city ordered the parts and supplies to complete the work based on input during the task force meeting (see partnership team above) and the city inventory. The supplier did not have all the parts and supplies in stock, so they had to be backordered. This delayed the city from making the replacements during the fall of 1997. Using materials in the existing inventory, the city was able to retrofit service lines to only two houses prior to freeze-up in 1997. This reduced water consumption from an average of 72,000 gallons per day (gpd) to 66,500 gpd.

In the spring of 1998 the freeze went deeper than usual into the ground, and delayed construction. This caused the city to ask for a grant extension. Once the ground thawed the city began construction. The city completed removal of the copper line and replacement with PE line in 18 service lines by freezeup in 1998. This reduced water consumption from an average of 62,000 gpd to 51,000 gpd, an overall decrease of approximately 30%. (During this period customer education also contributed to the reduction of water usage. See customer education below.)

The other maintenance project included installation of shutoff valves. The water system had some service lines with shutoff valves and some without. (The record does not include a count of how many of each.) This made it impossible to enforce collections uniformly by shutting off water for non-payment. Ordering the valves after project start-up took more time than anticipated. Also, the order was larger than any company had in inventory. It is reported that the manufacturer had to make more valves to meet the city's needs. Valves were installed during replacement of the copper lines. Replacement valves were installed in the remaining homes by November 1998.

### **Customer Education**

In an effort to reduce water consumption the city sent flyers to customers telling them about how they can reduce water use. The flyers included topics such as, fixing a leaking faucet, turning off the faucet when not in use, and the water consumption of continuous running water toilets. A city staff person went door-to-door to explain to customers the effects of letting the water run continuously. A letter was mailed to residents explaining the new billing system, the importance of making timely payments, and the penalties for non-payment.

The city hosted a small community demonstration on how to save water, this included: re-setting toilet tank levels to a lower level, showing the benefit of low-flow shower nozzles, and other ways to reduce water usage. Sessions were also provided at the school to teach kids the cumulative effects of not turning off the water when it is not needed.

A key benefit of the education program was getting residents to tell the utility they were going to be out of town for more than a few days. Once the shutoffs were installed the utility could shut off the water and not worry about broken pipes if the heat went out in the individual homes. This reduced the risk of frozen lines. The benefit for the owner was they were not billed for water during the period. Since starting this, the city has had fewer house freeze-ups.

## **Billing and Collections**

Another task included purchase of a new billing system to replace the existing system that was inefficient. The new system was purchased and installed in the fall of 1997. (The record does not have information on what kind of billing system that the city purchased.) The billing clerk was trained on the system and prepared it to start with the city's new fiscal year starting July 1, 1998. Due to hiring a new city clerk, the new billing system was not used until October 1998. As is often the case with starting a new system, there were a few bugs to work out. Once they were fixed, the system began running smoothly. The city installed the billing system without the help of RUBA. Instead, the city hired a part-time staff person (from within the community) to set-up the system and begin operations.

Prior to the start of the O&M Project city collections for the utility were estimated at 30%. Before the O&M Project the city did not have an equitable means for enforcement. One portion of the village had water service lines with shutoff valves while others did not have shut off valves. For this reason the city did not want to conduct partial enforcement. During the initial installation of valves in the fall of 1997 collections increased as people anticipated the city's ability to shutoff service for lack of payment. However, as it became obvious the city would not install all the shutoff valves that fall, collections went down. (The record has no numbers to show the fluctuations.)

Woven into the effort to improve collections was the economic downturn due to poor fishing. The water and sewer collections from households decreased three years in a row. For the fiscal year July 1, 1996 to June 30, 1997 the city collected \$23,804. For the fiscal year July 1, 1997 to June 30, 1998 the city collected \$16,060. For the fiscal year July 1, 1998 to June 30, 1999 the city collected \$14,506.

## **Training**

Operator training consisted of over-the-shoulder training in Nondalton at the facility and certification training in regional hubs, such as Dillingham. Soon after the project started the city identified what training the operators needed and when and where they were offered. An informal training schedule was developed.

The over-the-shoulder on-site training consisted of two visits. During the first visit the RMW taught the operator about water testing and other basic operations of a small water system. During the second visit the PHS engineer provided guidance on the new fluoridation equipment.

The operators went to Dillingham for boiler training during the fall of 1997 and pump training in September 1998. They were scheduled for a Confined Space training in February 1998 and OIT in June 1998. Both of these courses were cancelled and the operators did not get the training. There was one training the operators could not attend. As of November 1998 some staff were still waiting for the OIT training to be offered in the region. This became critical because the employee's certificates had expired.

## **Project Outcomes**

The City of Nondalton completed all of the workplan tasks. The project outcomes include:

Replacement of leaking water service lines;  
An estimated 30% reduction in water consumption due to repair of leaking water service lines and better customer usage habits;  
Installation of shutoff valves in the residential water lines;  
Purchase, installation and operation of a new utility billing system;  
Increased customer awareness about water usage and the importance of paying utility bills in a timely manner; and  
Coordinated continuing education for the water operator.

The problems the city of Nondalton faced with an older system may be representative of a growing number of village utilities. The city needed funding from outside their community in order to make the major repairs. The project demonstrated the capability of a village to direct and complete a major facility improvement for their water system.

The effect of several poor fishing seasons severely affected collections. The record does not indicate what cash reserves the city had prior to the poor fishing season. With the regional economy down, the city could only carry out the major facility improvements with funds from outside the village.

## **Research Questions**

The table summarizes the outcome indicators for Nondalton. The purchase and installation of the shutoff valves and replacement water line substantially improved the condition of the facilities. The O&M Project also provided parts which improved the O&M resources and contributed to improvement of the operators skills. The cost efficiency of the water system improved because of the decrease in water leakage. Collections started to improve, then decreased due to the decrease in money customers had available because of a poor fishing season (which decreased the money customers had available to pay utility bills). The financial management improved due to the purchase and installation of software purchased by the grant. The efforts by the city and several agencies lead to an overall increase in six of the twelve indicators.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Funds that could be used for utility operation and maintenance;  
Focused workplan which the city carried out; and  
Customer education.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF NONDALTON</b>			
Indicator	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	
Percentage of Scheduled Maintenance Activities	About the Same	Insufficient Information	
O&M Policies, Procedures or Planning	Unable to Determine	Insufficient Information	Not enough information available to determine if there was a change.
Operator Skills	Increased	Partially	The operator received over-the-shoulder training from RMW and PHS staff.
O&M Resources (Tools, Parts & Supplies)	Increased	Significantly	The grant provided funding for major part purchases.
Condition of the Facilities	Improved	Significantly	Replaced copper service lines with PE lines, reduced leakage.
<i>Financial and Utility Management</i>			
Collections	Unable to Determine	Significantly	Collections increased for a portion of the period; a poor fishing season later affected the ability to pay.
Cost Efficiency	Improved	Significantly	Installation of new water pipes reduced water leakage.
Financial Management	Improved	Significantly	
Utility Management	About the Same	Insufficient Information	
Utility Policies, Procedures or Planning	Unable to Determine	Insufficient Information	
Community Involvement	Improved	Significantly	Community education helped customers understand importance of paying for the utility.

### **Long-term Effects**

Nondalton has one of the oldest rural water systems in Alaska. The O&M Project provided the city necessary funding to make major repairs and improvements to their system. In 1999 OIT training was offered twice by the regional health corporations, due in part to, the city of Nondalton asking for the training.

There are three areas we believe are important for the long-term success of this project.

First, the city made major maintenance improvements that reduced water consumption. Replacing the coroding copper lines, will provide a long-term reduction in the operating cost of water treatment. With less leakage the city has to treat fewer gallons per capita. Over several years this will translate into reduced O&M costs through reduced demand for treatment chemicals, less wear and tear on pumps, and longer use of current storage capacity before needing to expand the system to accommodate population growth.

## *Phase II Community Reports*

Second, installation of the curbstops provides the city with the ability to enforce shutoff for nonpayment equally around town. This is beginning to contribute to a lower delinquency rate. The increase in collections will provide more operating revenue for the city. The utility now has the means to shut off water supply to customers who do not pay their utility bills. It is too early to tell how the system improvements will contribute to long-term improvements in collections because of the broader impact on the village economy of lower than average fishing seasons in recent years.

Third, the city demonstrated the capacity to obtain funding, use it for a specific task to improve the water system. We anticipate this will lead to an increase in scores on agency project funding evaluations.

## Shaktoolik

Shaktoolik is a Malemiut Eskimo village located on the east shore of Norton Sound. The villagers live predominately a subsistence lifestyle, depending on seal, beluga whale, caribou, moose and fish. There are two forms of government: the City of Shaktoolik, a municipal second class city, and the Native Village of Shaktoolik, a federally recognized tribe. The city operates the water and sewer facilities.

A piped water distribution system operates during the summer, during the winter residents haul water from the washeteria. Water for the village is pumped from the Togoomenik River 3 miles upriver (to avoid saltwater influence) to the water plant where it is treated and stored in a 794,000-gallon tank. All homes are connected to a liquid waste/sewage collection system. Seventy-five percent of the homes have complete kitchen and plumbing facilities. The sewage flows by gravity from each house to a leach field common to four houses.

In 1997 the village population was 226. The 1990 median household income was \$18,438. The First Year Report provides detailed background information on Shaktoolik, its water and sewer system, operations, maintenance, and management.<sup>14</sup>

### Project Plan and Objectives

The City of Shaktoolik requested \$39,968 to carry out a workplan with the following tasks:

*Partnership Team.* The City of Shaktoolik will form a partnership team consisting of the city council, city clerk, water and sewer operators, Alaska Native Health Board (ANHB) project manager, Rural Utility Business Advisor (RUBA), Indian Health Service, and other interested community members or agency representatives.

*Utility Clerk.* The city will establish a part-time utility clerk position to provide proper utility management. This will allow for improved services, customer education and increased community awareness of the importance of operating and maintaining the facility.

*Maintenance.* The city will order and replace worn out media for the sand filters.

*Facility Improvements.* The city will upgrade existing wastewater leach pits.

### Project Implementation

The project began July 1, 1997 and was completed June 30, 1998. The city used \$39,968 (100% of the grant award), with a community match of \$18,154.

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<sup>14</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

### **Partnership Team**

In their O&M grant application the City of Shaktoolik described a key need for a utility clerk. The city identified this need through discussions with RUBA staff and LGS staff, as well as their own discussions within the city council. This joint effort led to a city council member writing and completing the workplan prior to the first visit by the ANHB staff person in June 1997. The ANHB staff reviewed the draft workplan with the mayor, city council, the city clerk, and the water & sewer operator during his visit. The city clerk described earlier visits by the DCRA LGS and RUBA staff and their support of the workplan tasks. The city moved quickly to revise the workplan and provide the contract to ANHB.

### **Utility Clerk**

The city started with hiring a utility clerk. RUBA staff helped by providing example job descriptions for a utility clerk and reviewing the city's description once it was written. The first installment of the funding arrived and the utility clerk was hired in July 1997. The utility clerk went through an initial learning period as she became familiar with the method of bookkeeping, format for writing quarterly reports, and procedures for general office operations.

In August 1997 the RUBA staff visited Shaktoolik to work with the utility clerk and provided the first of four "over-the-shoulder" training sessions. During these visits the RUBA staff provided instruction on specific aspects of financial and personnel management. In between visits RUBA and LGS staff provided additional assistance by phone. Six months after the utility clerk was hired the RUBA staff reported, "The financial records and record keeping on the Washeteria have improved since the city hired the Utility Clerk." Prior to establishing the utility clerk position, the city council had not received information on utility finances in a timely manner.

### **Facility Improvement**

Soon after the utility clerk was hired the operator met with her to order the sand filter media and the materials for the leach pits. The materials arrived in the fall of 1997 so the work could be accomplished before freeze-up. The operator hired two labors on a temporary basis to help him.

In Shaktoolik the wastewater from four houses flows by gravity feed to a common septic tank. From there the effluent flows to a vertical standpipe to drain into the surrounding soils. The standpipes tend to clog-up. The operator and labors excavated the drain rock around the standpipe, repositioned it and covered the drain rock with new foam insulation. They were able to recondition five leach pits and re-insulate two septic tanks and leach pits.

After completing this task they had some leftover funds. They used the funds to install 160 feet of sewer line from two houses to existing septic tanks. This prompted the attitude, "Governor Tony Knowles would be proud of us, no more Honey buckets in Shaktoolik!"

### **Customer Education**

In the fall of 1997 the utility clerk and operator walked door-to-door to talk with customers personally about the importance of heat tapes and keeping the house level. This education helped customers learn the importance of what they can do to reduce maintenance problems and utility costs.

### **Rate Study**

At the request of the city council the RUBA staff (with the assistance of the utility clerk and water & sewer operator) developed a rate study for Shaktoolik during the fall of 1997. The RUBA staff asked the utility clerk to collect historic information on water usage, revenues collected and expenditures. In January 1998 RUBA staff presented the results of the rate study to the city council. The recommendations included:

Charge all large facilities the same commercial rate,  
Approve a budget that includes funds to conduct proper maintenance of the system and for equipment replacement,  
Increase collections by consistently following cut-off policies for customers who do not pay.  
Use other measures to increase collection rates, and  
Increase utility rates.

The rate study provided the background information the city council used in their discussions about raising the utility rates. A public meeting on the new rates was held during the February council meeting. After listening to public comment the city council increased rates for homeowners from \$50 to \$60 per month and commercial rates from \$55 to \$70 per month. The council also passed a new budget and a Code of Ordinances, which included utility ordinances.

### **Collections**

The rate study described several ways to improve collections. A range of ideas was included:

Positive-minded collection policies of discounts (if customers pay twelve months in advance),  
A raffle for those customers who pay on time (with a prize of a free month of utility),  
Disciplinary-minded collection policies of taking the customer to small claims court, or  
Taking away the customers Permanent Fund Dividend.

The utility clerk initially attempted to encourage yearly prepayment with a subsequent discount. However, it was found that most people did not have the necessary cash to prepay utility bills. With the approval of the city council, the utility clerk developed a monthly drawing. To enter the drawing a customer had to be current with utility payments (i.e., no outstanding money owed the water and sewer utility). The prize was one month's free utility. In the first month (June 1998), 19 people participated. By November, approximately 30 people participated. This led to a dramatic increase in utility revenues in a village with an estimated 46 homeowner accounts.

## **Financial Management**

At the beginning of the project all utility funds, the O&M Project and the city funds were kept in one account. The city was behind on paying some of its estimated payroll taxes. During the course of the O&M Project, the utility clerk, with assistance from the RUBA staff, set up a separate account for the utility and the O&M Project. This was a gradual process that required several conversations between the RUBA staff, the city clerk, the mayor, and the utility clerk.

## **Turnover**

During the course of the project there was turnover in three key positions. The city mayor decided not to run for office again and the village elected a new mayor. The first person hired as utility clerk resigned after eight months on the job and the city hired a new utility clerk. In August 1998 the utility operator of ten years resigned and the alternate operator became the primary operator. These turnovers did not affect the completion of the O&M grant. They did contribute to an overall decrease in knowledge about the water and sewage utility.

## **Project Outcomes**

The City of Shaktoolik completed all the workplan tasks. The project outcomes include:

- Hired and trained a utility clerk;
- Formed a separate account for utility revenues and expenses;
- Conducted rate study, presented proposed rate increase to city council and council passed rate increase;
- Increased collections, which increase revenues enough to cover the clerk's salary;
- Improved coordination between the city, RUBA and LGS staff;
- Performed maintenance on septic system leach fields; and
- Conducted customer education to lower maintenance costs.

Before the project approximately 40 percent of the customers were paying their bills. By the end of the project, due to the efforts of the utility clerk, the collection rate increased to approximately 90 percent.

This project demonstrated the benefits of a city, state agency and funding agency working in partnership. The city council initially realized a need and proceeded to obtain the grant funds to address the need. Then the mayor, city council, city and utility clerks, utility operator, RUBA and LGS staff worked together to address issues one by one. The funding provided the city with a staff person to directly address utility management issues. The mayor, city clerk, RUBA and LGS staff provided over-the-shoulder training to assist the new staff person (the utility clerk) with learning the necessary skills. Turnover of the mayor and utility clerk slowed implementation of the grant, but not for long. An important aspect of this project was its success even with staff turnover.

The O&M Project provided the funding to begin implementing changes. The RUBA staff developed many recommendations in the rate study. The mayor and city council reviewed the recommendations and adopted the increased rates and revised

ordinances. Because of the work by the utility clerk and others, the increased collections are anticipated to continue to generate the revenue necessary for funding the personnel cost of the utility clerk.<sup>15</sup>

### **Research Questions**

The table summarizes the outcome indicators for Shaktoolik. The condition of the facilities and O&M resources improved as a result of the O&M Project. The operator conducted maintenance on the leach fields and hooked-up more houses to the leach fields. All six of the financial and utility management indicators improved because of the efforts of the utility clerk (hired with O&M Project funds), city, RUBA, LGS and ANHB staff. The persistence and teamwork of the city staff, utility clerk and agency staff led to step-by-step improvements. The efforts by the city and several agencies lead to an overall increase in eight of the twelve indicators.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

City council focused on improving city operations, specifically utility management;  
Effective communication among city, RUBA, LGS and ANHB staff; and  
Focused workplan that was achievable.

### **Long-term Effects**

There are four areas we believe are important for the long-term success of this project.

First, the community demonstrated a forward-thinking attitude in the specific tasks they described in the O&M Project and in how they carried out the workplan. This foresight, if continued, will guide the city towards the next steps for improving utility management.

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<sup>15</sup> Shaktoolik provides an illustration of some of the benefits of building community capacity through over-the-shoulder training on utility management, Recommendation 2, Component II – 'Incrementally expand the Rural Utility Business Advisor (RUBA) program to at least twelve positions.' In the Governor's Council on Rural Sanitation. *Rural Sanitation 2005 Action Plan*. Juneau, AK: State of Alaska, Department of Environmental Conservation, 1998.

OUTCOME INDICATORS FOR THE VILLAGE OF SHAKTOOLIK			
Indicator	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	No change in operator hours during period.
Percentage of Scheduled Maintenance Activities	Unable to Determine	Insufficient Information	Insufficient information available.
O&M Policies, Procedures or Planning	About the Same	Insufficient Information	No change during period.
Operator Skills	Decreased	No	Operator of ten years resigned and alternate took the job.
O&M Resources (Tools, Parts & Supplies)	About the Same	Significantly	Supplies increased during the period, put to use right away and not re-stocked.
Condition of the Facilities	Improved	Significantly	The operator conducted maintenance on leach pits and hooked up two more houses to gravity flow sewage disposal.
<i>Financial and Utility Management</i>			
Collections	Increased	Significantly	The utility clerk hired by the grant increased collections from an est. 40% to 90%
Cost Efficiency	Increased	Significantly	The maintenance conducted by the operator will increase the life of the leach fields. The utility clerk has improved efficiency of utility financial management.
Financial Management	Improved	Significantly	Utility clerk trained by RUBA staff and city staff, establish separate utility account.
Utility Management	Improved	Significantly	Teamwork of utility clerk, RUBA, LGS and city clerk improved washeteria management.
Utility Policies, Procedures or Planning	Improved	Significantly	RUBA staff, with assistance from utility clerk and operator, developed rate study and ordinances. This lead to rate increase approved by city council.
Community Involvement	Increased	Significantly	The utility clerk hired by the grant worked w/ operator to encourage community support.

Second, the city staff worked well with the RUBA and LGS. The teamwork of agency experts assisting city staff with improving their skills for financial and utility management is expected to continue.

Third, the turnover of personnel in mayor, utility clerk and utility operator did not affect the success of the O&M project. This indicates Shaktoolik has enough "community" knowledge about O&M that will continue to improve even if they have more turnover.

## Shishmaref

Shishmaref is a traditional Eskimo village located on Sarichef Island, in the Chukchi Sea. The villagers live a predominately subsistence lifestyle, depending on fish, walrus, seal, and other subsistence foods. There are two forms of government: the City of Shishmaref, a municipal second class city, and the Native Village of Shishmaref, a federally recognized tribe. The city operates the water and sewer facilities.

Water is collected from a surface source, treated and stored in a water tank. Residents haul water from the washeteria to their homes. The city has been on honey bucket haul. In 1996 IHS funded the first phase of a flush tank and haul system in twenty homes and a building retrofit to store haul vehicles. The second and third phases will add all existing homes to the haul system.

In October 1997 a storm caused severe erosion, washing away an estimated 30 feet of beachfront in front of the village. This erosion caused the evacuation of eleven homes, of which only four could be saved by moving to safer ground.

In 1997 the village population was 542. The 1990 median household income was \$15,625. The First Year Report provides detailed background information on Shishmaref, its water and sewer system, operations, maintenance, and management.<sup>16</sup>

### Project Plan

The City of Shishmaref requested \$40,000 in 1996 (Phase I) to carry out a workplan with the following tasks:

*Partnership Team.* The City will form a partnership team with: David Nairne & Assoc., Chuck Eggener & Assoc., the Alaska Native Health Board, the Dept. of Community and Regional Affairs, the city clerk, the city council, the water and sewer operators and the finance director.

*Parts & Supplies.* The City will purchase needed replacement parts and new pumps for the water plant.

*Community Education.* The City will work with the community to educate its residents on the operation and maintenance of the water plant and washeteria by posting signs on the proper way of handling equipment and machines in the water plant and the washeteria.

*Utility Management.* The City will continue to monitor revenues and costs of running all its sanitation facilities. It will review the established rate structure to identify what revenue will be necessary to ensure the long-term operation of both the water plant and washeteria. The city will deposit funds in a separate bank account. The grant will contribute to funding operator wages.

*Operator Training.* The city will send its water plant operator and assistant to training to achieve certification.

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<sup>16</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

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*Customer Satisfaction.* The City will ask each customer to complete a survey prior to commencement of flush haul service. The survey will include a description of rules the customer agrees to and that they will be responsible for the repair and maintenance of those parts that have been misused.

In 1997, the City of Shishmaref applied for a second year of funding (Phase II) and received \$20,000 to continue the workplan tasks described above.

### **Project Implementation**

The project began September 1, 1996, was granted one extension and was granted a second year of funding starting December 1, 1997. During the second year the city was granted four extensions: the project is due to be completed December 15, 1999. In the first year grant the city used \$40,000 (100% of the grant award), with a community match of \$39,603. In the second year grant the city used \$5,000 (25% of the grant award), with a community match of \$4,045.

### **Partnership Team**

In August 1996, the RUBA and city staff met to discuss a set of guidelines for improving financial management (see financial management section below). During this visit the RUBA staff presented to the city council the results of a utility assessment conducted by RUBA and LGS staff in March 1996 (see utility management section below). During the fall of 1996 city staff worked on improving the bookkeeping and the village elected a new city mayor.

During the fall 1996 RUBA staff and the RMW discussed the city's maintenance needs and coordinated purchase of a new boiler with the city, PHS and ANHB (see maintenance section below).

In early 1997, agency staffs (IHS, RMW, RUBA and VSW) conducted a teleconference to discuss conditions within the city of Shishmaref. They came to the conclusion that further phases of the flush haul system should be delayed until the city addressed shortcoming in its financial and utility management. Later in the year relations between city staff and various agency staffs deteriorated. During this period, RUBA and ANHB staff continued their phone assistance and RUBA continued their site-visits.

In the spring of 1998 there was a change in PHS engineers. By the summer of 1998 the new IHS engineer became more active with addressing the city's needs. By the fall of 1998 there was improvement in communications between city and agency staff. The city clerk began calling the appropriate agency staff directly to ask specific questions and describe problems. Previously the city clerk had used the RUBA staff as an intermediary. At a meeting of the RUBA and LGS staff and the city council in September 1998 the council told the agency staff that it was the most informative meeting on the operating problems they had ever had. The council felt the agency staffs were listening to them.

By the spring of 1999, the City of Shishmaref and agency staffs came to realize their hard work and intense coordination paid off in terms of improved financial and utility management.

## **Parts & Supplies**

In the fall of 1996 the operator provided the city clerk with a list of parts to purchase. There was some discussion between the operator and city clerk as to who would purchase the parts. In the spring of 1997, the RMW assisted with a compilation of a list of critical spare parts for the washeteria and water plant. In spring 1998, the city clerk mentioned she was waiting for the operators to come up with a list. She could not find the RMW's list. By the summer of 1998, the operators had ordered spare parts from the list developed by the RMW.

## **Maintenance**

### ***Washeteria***

In November 1996, a private maintenance technician who specializes in the laundromat washers and dryers flew to Shishmaref to service the equipment. The washeteria was built in 1984 and has older models of equipment and it is hard to get parts for. The maintenance technician found only one machine was not repairable. A few days after the repairs were completed the washers were not working. (the record does not have details on why they did not continue operating for a longer period of time.)

In February 1997, the city purchased three washing machines and spare parts from Gambell. One unit was installed in February and the rest of the units could not be installed until summer when some changes in the plumbing under the building could be made.

In the summer of 1998, the RMW worked several long days with the operator to install new parts in the washeteria and cleaned out the water tank. Later that summer, PHS staff worked with the RMW to order approximately \$30,000 of parts for partial renovation of the washeteria/pump house.

### ***Water Treatment Plant***

In the fall of 1996, RUBA staff and the RMW discussed maintenance needs in Shishmaref and determined a boiler in the water treatment plant needed replacement. PHS provided an emergency grant for the boiler, ANHB assisted with boiler transfer and paperwork. The boiler arrived in Shishmaref in early 1997 and was placed in the water treatment plant. There were several months before the boiler was installed. Apparently there was a lack of qualified personnel to install it and a lack of the required fittings. A qualified person who lives in the village was identified. He left the village before the parts order arrived. The boiler was finally installed by July 1997.

## **Facility Improvements**

In the summer of 1996, the contractor installed flush haul units in nineteen homes. During the first winter of operation (1996/97) the haul operators experienced many difficulties with the sewage haul equipment. When full the sewage haul unit was too heavy for the ATV to pull. The operators tried a snow machine and had difficulties. Some times they used both the ATV and snow machine. For two weeks in November 1996 they were unable to pull the haul units because they were waiting for parts for the snow machine and ATV. Later in the winter the haul operators continued to have problems

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pulling the haul units through the snow, spending an excessive amount of time and effort on the process.

During the winter of 1996/97 the city experienced problems with the pipes freezing in the flush haul units. The number of units reported to freeze-up that winter varied from five to nine units. (We were unable to determine which is the accurate number of units that had problems). RUBA notified IHS of the problems, it was reported to the engineer and he took steps to correct it with the contractor.

The contractor came to Shishmaref in June of 1997 to repair the units installed during Phase I of the flush haul system. Operation of the system remained less than adequate.

During the winter of 1998/99 thirteen of the nineteen flush haul units did not work properly. This contributed to significant maintenance costs for the city and operator frustration. One resident was reported to have moved out of their house because the odor got so strong. Other residents described problems with odors and sewage backing up into the showers.

### **Customer Education**

The contractor who built the flush haul system was reported to have provided posters, placards, and pamphlets for the houses. The record provides no information that describes what additional customer education activities took place or what was the outcome of the efforts.

### **Utility Management**

The city requested RUBA assistance with improving the city's capacity for utility management as they prepared for the new flush haul system. In March 1996, RUBA and LGS staff conducted a detailed utility management assessment to describe the current state of affairs and identify specific tasks for improving operations. In August 1996, RUBA staff reported to the city council the results of the assessment.

The assessment found:

washeteria rates were too low to cover costs;  
there were problems with collections;  
in some cases, accounts were being billed improperly or not at all;  
the city staff were competent;  
the staff were new on the job and lacked specific training and experience on what they were to do; and  
the city council was not receiving financial reports and did not have a handle on the financial conditions of the utility.

The O&M Project provided partial funding for the personnel cost for the city staff as they worked with the RUBA staff to address the most critical issues first (see financial management below).

One of the first issues was the condition of the washeteria. The washeteria was not generating the revenue it needed for proper operation and maintenance; the additional funds had to be found in the city budget.

In the summer of 1998, the IHS engineer and the RMW increased their involvement with the repairs and improvements to the existing facility. These efforts energized the utility staff, city council and general public. In the fall of 1998 the agency staff (ANTHC engineer, NSHC/OEHE, RMW and RUBA) coordinated with the city clerk to compile information on needed repairs and where to get assistance to carry out the repairs.

In early 1999, attention turned to improving the utility filing system. There was no centralized record keeping system for the city or utility that had files for vendors, customers and payroll. The O&M project workplan was revised to specifically address this task.

### **Financial Management**

After the utility management assessment (see utility management above) RUBA staff developed four guidelines for the city to improve its financial management:

Straighten out the bookkeeping;  
Deal with IRS taxes on current payroll;  
Figure out debts and begin repayments; and  
Improve revenue and cut costs.

In early 1997, RUBA staff assisted the city clerk and bookkeeper with setting up a separate account for the O&M project funds. The bookkeeper then made sure the grant was used for grant tasks. Initially, She had some difficulty learning how to make financial reports and received assistance from RUBA staff. By March 1997, the city staff brought the books up-to-date and completed reconciliation through December 1996. The progress continued through the summer of 1997. The city staff made good progress with putting the record keeping in order. Monthly financial statements were generated. Through this period RUBA staff visited Shishmaref and provided phone assistance.

By early 1998, the city clerk had tightened up cash receipt procedures at the washeteria. Projections for FY98 showed the revenue vs. expenditures for the washeteria were at break even. The city improved its financial management using a combination of hand ledgers and automated spreadsheets. RUBA staff recommended the next step for the city was to obtain a good accounting software package and computers so the utility clerk could develop reports of accounts more easily.

### **Training**

In 1996 and 1997, the operators did not attend any trainings. The RMW visited a number of times in 1997 to assist the operator and they were not able to get together. In April 1998 both water treatment plant operators attended OIT training in Nome. They showed enthusiasm for the training and requested information and study materials from the RUBA staff. In 1998, the RMW started to incorporate math problems into his over-the-shoulder training during his site visits. The water treatment plant operators took the OIT class and test in February 1999. However, they did not pass. After this they became determined to pass one of the tests the next time.

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In September 1998, the mayor and city clerk attended the NSHC "Introduction to Utility Management" workshop in Nome taught by DCRA staff. In early 1999, the city clerk attended the NSHC "Utility Financial Management" workshop in Nome taught by DCRA staff. In February 1999, the city clerk took the OIT class in Nome and became certified for water treatment and distribution.

### **Turnover**

In June 1996 the acting city clerk who wrote the O&M project grant application left and was replaced by a city clerk hired by the city council in June 1996. In early 1997, the city hired a new bookkeeper. The bookkeeper left in September 1997. In December 1997, the city clerk resigned and the city hired a new city clerk. The haul operator resigned in February 1998. In the spring 1999, the utility clerk resigned and the city hired a new clerk. The city elected a new mayor in the fall of 1996. The RMW working with Shishmaref changed in 1998. The PHS engineer in charge of the flush haul construction changed in 1998.

### **Project Outcomes**

The City of Shishmaref worked on all of the workplan tasks and fully completed three of the six tasks. The project outcomes include:

Improved financial management,  
Improved maintenance of the washeteria,  
Improved the water treatment plant,  
Increased collections, and  
Improved relationships among the city and agencies.

The City of Shishmaref made significant improvements during the project period. Shishmaref is one of the two Phase I communities selected for a second grant (see Tanana for the other).

Shishmaref is an example where the city, contractors, agencies and ANHB focused from the very beginning to use the O&M Project to assist the village prepare for a new utility system, while maintaining the existing system. Specifically, while the city was in the planning and design stages of their new flush haul system the acting city clerk talked with the contractor (for the new system) about what the city could do to prepare for the new system. They discussed the city's current management capability and how the O&M Project grants could help the city. The contractor helped the city fill out an application and submit it. After the city was selected for the O&M project grant several agencies talked with the city staff and ANHB staff about what to include in the workplan.

The Norton Sound Health Corporation (NSHC) RMW provided an assessment of immediate O&M needs. The engineering consultant provided his ideas for what to include in the workplan. With the different agency perspectives on the needs for the city water and sewer utility, the city staff talked with the ANHB staff and developed a workplan.

During the two years of the O&M Project, agency coordination and communication improved among the agencies, and between the agencies and the city.

From the available information it appears that in 1996 and into 1997 the agencies carried on much of their coordination without the participation of city staff. It appears this shifted in 1998 and 1999 and the city staff was included in more of the coordination meetings.

The cooperation between ANTHC, NSHC/OEHE, RMW, RUBA, LGS and ANHB is an example of agencies working together to assist a community improve its capacity for utility management. A key to the project success is that the city staff and city council were motivated to improve their skills; specifically the city council provided leadership to the city staff. This contributed to an improved relationship between the agencies and the city. The O&M Project funding played an important role by providing the city funds to maintain staff while they worked to improve maintenance and collections.<sup>17</sup>

One of the main tasks for the O&M Project was to prepare the city administration and customers for the new flush haul units. The purpose of this education was to make the customer more familiar with the new equipment in their homes and reduce the potential for maintenance problems during the winter.

In the three years since the flush haul units were installed the city has had difficulty with several aspects of the system. From the information we have available, there are four aspects of the flush haul system that we believe adversely affect the ability of the city to properly operate and maintain the system:

1. During design review there were differences of opinion about the design. Specifically, it was thought certain aspects of the design and installation might have the potential for freeze-up.
2. The education efforts were either unsuccessful in reducing maintenance costs, or the problems customers had with the system were beyond the reasonable capability of a customer to deal with.
3. The method and equipment for the haul operators to collect sewage from the homes and haul to the disposal location appeared to be inadequate for the winter conditions in Shishmaref.
4. The city had a difficult time providing adequate service to customers (and therefore being able to collect utility fees) because of the excessive maintenance required by flush haul units and customer dissatisfaction with the units operation.

## **Research Questions**

The table summarizes of the outcome indicators for Shishmaref. As a result of the O&M Project the condition of the facilities improved, specifically the washeteria. The O&M resources improved, the city purchased spare parts using O&M Project funds and assistance from the RMW. The operator skills improved due to attending training partially supported by O&M Project funds and coaching from the RMW. The financial

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<sup>17</sup> Shishmaref provides an illustration of some of the benefits, issues and frustrations that arise when following an approach similar to Recommendation 4, Component I – ‘Award construction grants contingent upon communities meeting agreed upon performance targets.’ In the Governor's Council on Rural Sanitation. *Rural Sanitation 2005 Action Plan*. Juneau, AK: State of Alaska, Department of Environmental Conservation. 1998.

and utility management improved because the O&M Project provided funding for city personnel costs while RUBA provided over-the-shoulder training. The efforts by the city and several agencies lead to an overall increase in ten of the twelve indicators.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Tenacity of the city and agency staff to keep working to improve utility management; O&M Project funding that paid personnel costs for city staff while they improved collections; and

Longer grant period allowed for the change to occur (that could not in one year).

### **Long-term Effects**

During this project there were several ebbs and flows of success and setbacks. The two-year project also provided a chance for ISER to track the reality of improving water & sewer utilities over a multi-year period. There are three areas we believe are important to consider for long-term success of this project.

First, the two and a half-year grant period allowed the city and agency staff the opportunity to try a particular approach, learn from it, try again, learn from the second try and try a third time. Improving the community capacity for utility management in Shishmaref took longer than one year. The City of Shishmaref needed the second year to provide them time to consolidate what they learned during the first year.

Second, the focused attention by the city, city council, agencies, contractor, and ANHB over a sustained period brought improvements. The foundation has been laid for another round of improvements. Without the O&M Project funding it is not clear where the city will obtain funding to carry out the tasks that are ineligible for state or federal grants.

Third, the phone assistance of agency staff was critical for answering questions, exploring ideas, and venting frustrations. While various agencies will continue to provide phone and on-site assistance after the completion of the O&M project, the ANHB assistance will stop. The 'non-agency' perspective provided the city staff a 'third-party' during the period of strained communication between the city and agencies. Without this informal 'third-party' role available to the agencies and city staff, it is unclear what may happen if the city and agencies go through another cycle of strained communication as Phase II of the flush tank haul system is developed.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF SHISHMAREF</b>
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Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Increased	No	There is a slight increase in operator hours.
Percentage of Scheduled Maintenance Activities	Increased	No	As the facility was fixed, operators shifted from reactive fixes to proactive fixes.
O&M Policies, Procedures or Planning	Improved	No	Contractor and ANTHC developed information for the city.
Operator Skills	Increased	Partially	Operators attend trainings and increased skills, however, did not increase certifications.
O&M Resources (Tools, Parts & Supplies)	Increased	Significantly	The O&M project provided funds for the city to purchase parts, RMW worked with operator to make repairs. PHS contributed funds for parts and new boiler.
Condition of the Facilities	Improved	Significantly	Washeteria improved significantly, condition of flush haul system declined.
<i>Financial and Utility Management</i>			
Collections	Increased	No	Because of efforts by the city clerks and RUBA, and improved washeteria maintenance, more revenue was collected.
Cost Efficiency	About the Same	No	
Financial Management	Improved	Significantly	City staff worked with RUBA and LGS to improve bookkeeping. O&M project provided personnel funding.
Utility Management	Improved	Significantly	City staff attended training and worked with agencies to improve management.
Utility Policies, Procedures or Planning	Increased	No	Homeowners signed user agreements with the city.
Community Involvement	About the Same	Insufficient Information	The community started to change as the maintenance on the washeteria improved.

## Tanacross

Tanacross is an Athabascan Indian village located on the south bank of the Tanana River. The villagers live predominately a subsistence lifestyle, depending on moose, whitefish, ducks, geese, ptarmigan and rabbit. There is one form of government: the Tanacross Village Council, a federally recognized tribe. The Tanacross Village Council operates the water and sewer facilities.

Piped services have been available in Tanacross since 1976. The water source is groundwater. Water is pumped, treated and stored in a 25,000-gallon tank and piped to most homes. Some residents have individual wells. For sanitation, the houses are connected to gravity fed septic systems and leach fields.

In 1997 the village population was 85. The 1990 median household income was \$14,750. The First Year Report provides detailed background information on Tanacross, its water and sewer system, operations, maintenance, and management.<sup>18</sup>

### Project Plan

The Tanacross Village Council requested \$28,475 to carry out a workplan with the following tasks:

*Partnership Team.* The Tanacross Village Council will form a partnership team with: the Alaska Native Health Board, Tanana Chiefs Conference (TCC), PHS Office of Environmental Health and Engineering and members of this village council, administrator, water plant operator, and O & M planner.

*Parts & Supplies.* The tribal council will develop an inventory of spare parts, sort and store parts to make them readily accessible, develop a list of spare parts for purchased, and purchase parts.

*Maintenance.* The tribal council will purchase a boiler to replace the non-functioning boiler.

*Utility Manager.* The tribal council will establish a utility management planner position to work with the village administrator, the village accountant and the water plant operators. The planner will:

develop an Operation & Maintenance Plan;

setup community meetings to educate the community on the cost of operating and maintaining the utilities;

implement user fees; and

write draft utility ordinances for village council review and approval.

*Operator Training.* The tribal council will upgrade the water plant operator position to provide increased operator benefits by increasing operator hours and provide for training to increase the operator's level of certification in wastewater collection and water treatment.

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<sup>18</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Project Implementation**

The project began July 1, 1997 and was completed June 30, 1998. The tribal council used \$28,475 (100% of the grant award), with a community match of \$13,216.

### **Partnership Team**

Prior to the start of the O&M grant project, Tanacross tribal council staff had an active working relationship with a variety of agency staff and consultants. The core contacts included: RUBA staff; the TCC RMW, OEH and LGS; PHS sewer project engineer; an accounting firm; and an engineering consultant. Soon after the O&M Project started the tribal administrator sent the workplan to the agency contacts who directly involved with the tasks in the proposed grant project so they would know about the project. They were also asked for their input and participation in carrying out the workplan.

As the O&M Project got under way, people involved within the village included: the council president and vice president, the tribal administrator, the maintenance supervisor, the bookkeeper, and the water plant operator. The people involved from outside the village included the agency staff who were the core contacts listed in the previous paragraph. During the course of the O&M Project the PHS engineer changed three times.

### **Parts & Supplies**

In the fall of 1997, the tribal administrator met with the tribal maintenance supervisor and the water plant operator to discuss the development of a parts list and the purchase of replacement parts. After this meeting the maintenance supervisor met with the TCC RMW. They went through the facility and developed a parts list. The list was long and had to be prioritized into two groups: first, parts that needed immediate replacement; and second, parts that would be purchased, as funding allowed, for developing an inventory and for future maintenance.

After developing the parts list, the maintenance supervisor worked with the operator to prioritize what to purchase. He also worked with the TCC RMW and TCC engineer to identify suppliers and distributors for the parts. In the worst cases, replacement pumps were no longer available. The three staff worked together to identify where to send the pumps for rebuilding. For other equipment, they developed a list of parts numbers, manufacturers, and the vendors or distributors.

The maintenance supervisor setup a file in the village council office with all the inventory and vendor information. This made the information available to the supervisor or operator whenever they need to tell the bookkeeper what to order and from which vendor. With the extensive inventory the bookkeeper has easily available the manufacturers name, equipment model name and parts number to ensure accurate purchasing.

## **Maintenance**

During the parts inventory, priority was placed on researching a replacement boiler system. The type of replacement boiler was identified; bids were requested from vendors and received. The boiler was ordered. It arrived in the spring of 1998 and was installed at the water plant. This became the primary boiler, with the others as backups.

## **Utility Manager**

In the workplan the village council proposed to hire a new staff person to work 20 hours per week with the tribal administrator, bookkeeper and water plant operator. Soon after the O&M Project started it was decided that rather than hire a new person the tribal staff would split the duties and funding of the new position among existing staff: the tribal administrator and the maintenance supervisor. The tribal administrator was responsible for grant management and overseeing development of the ordinances. The maintenance supervisor handed more of the day-to-day activities of parts inventory and equipment purchase.

## **Customer Education**

In planning for the new sewer system, the tribal administrator and agency staff recognized the need for educating customers on the new sewer system and the need for paying user fees. The village residents were not paying water & sewer fees. During the winter of 1997/1998, the tribal council president and the maintenance supervisor planned and organized a public meeting to discuss the new sewer system. The tribal council staff presented information on user fees, user agreements and contracts, and the additional costs of the new system. They described the enforcement of fees and acknowledged the burden that it may cause for some people. The twelve to fifteen people in attendance generally agreed that it was good to set up user fees.

During the school year the operator occasionally took children on tours of the water plant, among his other duties. He taught them about where their drinking water came from and how it gets to their home. He stressed the value of water and urged them not to waste it.

## **Ordinances**

The tribal council hired an accounting firm to develop draft tribal ordinances. The tribal administrator coordinated with the TCC LGS, RUBA staff and the firm to ensure the draft ordinances contained the necessary sections for utility management. During the drafting of the ordinances there were several meetings in the village, usually attended by five to seven people. The tribal council adopted some ordinances on a temporary basis as they were developed. The tribal council adopted the full set of ordinances in the spring of 1999.

The ordinances contain a section on tribal business operations that includes the water and sewer system. This chapter of the ordinances includes the following sections:

purpose, implementation and enforcement;  
tribal council power's and responsibilities;  
definition of terms and prohibited acts;  
connection to the village system;  
maintenance required and authorized inspections;  
utility rates;  
termination of service; and  
sample user agreement, notice of disconnection and reconnection.

### **Training**

Prior to the start of the O&M Project, in October 1996 the tribal administrator attended training sponsored by TCC and DCRA "Introduction to Utility Management." The water plant operator went to several trainings provided by TCC. They included boiler maintenance, and washer and dryer repair. The operator attended the trainings and improved his skills. However, he did not pass the certification tests. The village is broadening the pool of certified staff. The tribal president, who also works as a staff person, took boiler training provided by the regional housing authority. The tribal administrator and tribal vice president took the OIT training and passed the certification tests. The tribal staff took the training to increase the number of certified people in the village and to help the village score higher on the sanitation deficiency survey taken by the Indian Health Service.

### **Project Outcomes**

The Tanacross Village Council completed all but one of the workplan tasks. The project outcomes include:

Developed a spare parts priority purchase list;  
Developed of a replacement parts inventory and information file;  
Purchased and replaced of a boiler;  
Drafted and passed a tribal ordinance on water and sewer operation; and  
Provided training for the water plant operator.

The tribal administrator requested the O&M Project to improve the existing utility system while preparing for operation of the new sewer system. The boiler replacement will reduce maintenance costs for several years. The parts inventory should reduce the time spent identifying parts when ordering replacements. The passage of tribal ordinances, which includes a chapter on water and sewer operations, provides a foundation for the users to know their rights and responsibilities with the new sewer system. Because the sewer project is built with local labor, the village increased the number of locals who know the system. The construction crew may be a source of personnel for the utility in the future.

The tribal administrator and bookkeeper, step-by-step, made improvements necessary to improve operation and maintenance of sanitation services in Tanacross. They worked with the tribal council and key agency staff in this process. This shows in

the overall improvement of utility operations. Even though collections increased, it started from a very low base, and will need to increase substantially once the new sewer system is in operation.

The record does not contain information on whether the workplan task of developing an O&M plan was accomplished by the completion of the O&M Project. The utility manager was originally envisioned as a new staff position who would continue after the completion of the O&M grant. Once the project began, it was decided to use this portion of the grant funds for existing staff. There are several possible reasons this occurred, most relate to the delay in completion of the sewer system and increased costs due to unforeseen construction conditions. These events had a ripple effect in the delay of passage of the water and sewer ordinances, delay in starting collection of user fees, and increase in costs for tribal council.

### **Research Questions**

The table summarizes the outcome indicators for Tanacross. The condition of the facilities improved when the RMW and the operator replaced a boiler purchased with grant funds. The O&M resources improved because of parts purchases and the operator skills improved because of more training. The O&M procedures improved because the operator and RMW developed a parts inventory and used it to purchase parts. The utility management and policies improved when ordinances were developed, discussed at tribal council meetings, and passed by the council. The efforts by the tribe and several agencies lead to an overall increase in seven of the twelve indicators.

The factors we believe contributed to the tribe's capacity to accomplish the project outcomes include:

Teamwork of tribal administrator, tribal bookkeeper and tribal staff with RUBA and ANHB;  
Coordination among operator, RMW and bookkeeper; and  
Willingness to address tough community issues (e.g. establishing ordinances, user agreements and user fees).

### **Long-term Effects**

The tribal administrator and bookkeeper during the project period were well skilled in the financial management of the utility. The tribal leadership is interested in doing what they can to have a well-run utility. This grant helped the village prepare for operation of the new sewer system. Over the next several years the tribe and supporting agencies will be able to determine what effect this preparation had on the financial and operational management of the water and sewer utility. The customers are accustomed to very minimal or no user fees. Because Tanacross is on the road system, some residents feel they can avoid current costs by driving to Tok for laundry. It will be important to monitor the customers' response for paying user fees once the new sewer system is operational.

As of the writing of this report, the tribal administrator resigned and moved out of the village. It is unclear what effect this change in personnel will have on utility management.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF TANACROSS</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Insufficient Information	The operator's hours spent on the water plant stayed the same, while his total may have increased.
Percentage of Scheduled Maintenance Activities	About the Same	Insufficient Information	The operator spent about 4 hrs/wk.
O&M Policies, Procedures or Planning	Improved	Partially	The maintenance supervisor, operator and RMW developed a parts inventory to aid in ordering parts in the future.
Operator Skills	Improved	Significantly	The operator attended several trainings; however, he did not pass any of his certification tests. Others in village attended trainings also.
O&M Resources (Tools, Parts & Supplies)	Increased	Significantly	Additional parts and supplies were purchased using grant funds.
Condition of the Facilities	Improved	Significantly	A replacement boiler was purchased and installed using grant funds. The washeteria operations have improved.
<i>Financial and Utility Management</i>			
Collections	Increased	No	The tribe increased washeteria collections and is building public support for sewer system user fees.
Cost Efficiency	Unable to Determine	Insufficient Information	There maybe savings as a result of the improvements, ISER does not have this information.
Financial Management	Improved	No	Capable tribal administrator and bookkeeper. Made improvements after financial audit. Worked well with RUBA and ANHB staff.
Utility Management	Improved	Significantly	Improved management of existing facilities while preparing for new facilities.
Utility Policies, Procedures or Planning	Improved	Partially	Hired consultant to draft ordinances. They held review meetings, and tribal council passed the ordinances in spring of 1999.
Community Support	Increased	Partially	Held public meeting to discuss the need for user fees. There seems to be acceptance of the need to pay for new sewer services.

## **Tanana**

Tanana is an Athabascan Indian village located at the confluence of the Tanana and Yukon Rivers. The villagers live a predominately subsistence lifestyle, depending on moose, bear, salmon, whitefish, ducks, geese, ptarmigan and berries. There are two forms of government: the City of Tanana, a municipal first class city, and the Native Village of Tanana, a federally recognized tribe. The city and tribe joined together in the spring of 1996 to create a non-profit utility, Too'gha, to operate the water and sewer facilities.

At the start of the project, the city council and tribal council operated separate drinking water systems. The city water system serves the city laundromat, Head Start building, fire hall and city offices. The tribal water system serves the school, teachers housing, tribal offices, elder's residence, and residences of the health director and the physician assistants. In 1997, construction of a new laundromat started.

In 1997 the village population was 299. The 1990 median household income was \$17,000. The First Year Report provides detailed background information on Tanana, its water and sewer system, operations, maintenance, and management.<sup>19</sup>

### **Project Plan**

The City of Tanana requested \$40,000 in 1996 (Phase I) to carry out a workplan with the following tasks:

The city will form an independent non-profit corporation, Too'gha, to manage, operate and maintain the water and sewer services, including improvement of existing facilities and construction of new facilities. The city will hire a utility manager to establish and operate the utility. Activities include conduct board training, host the first annual membership meeting and enhance and refine the overall plan.

The city will transfer operation and maintenance of the water and sewer facilities it currently operates to Too'gha. Activities include establish utility budget, train staff, establish accounting procedures, recondition existing facilities and establish operating and maintenance procedures.

Too'gha will assume full operation and maintenance of water and sewer services to the community of Tanana. Activities include obtain necessary equipment, retain operators, maintain list of substitutes, set up and maintain stock of replacement parts.

Too'gha will work with the appropriate agencies to construct a new water and sewer facility, to include piped water for the central area plus a laundromat/showers and watering point.

Too'gha will assume ownership, operation and maintenance of the new system when it is completed.

In 1997 Too'gha applied for a second year of funding (Phase II) and received \$20,000 to support the utility manager's salary, benefits and travel.

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<sup>19</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## Project Implementation

The project began July 1, 1996 and was granted a second year of funding starting October 1, 1997. Too'gha completed the project June 30, 1998. In the first year of the grant Too'gha used \$39,999 (100% of the grant award), with a community match of \$122,820. In the second year of the grant Too'gha used \$20,000 (100% of the grant award), with a community match of \$26,432.

### Partnership Team

The O&M Project began after the city council and tribal council agreed to establish a nonprofit utility and use the O&M Project to fund startup costs. Within the community, the active participants on the project were the city administrator, utility manager and Too'gha board.

The key supporting agency and consultants were:

RUBA	Bookkeeping, personnel policy and management agreement;
VSW	Project feasibility, project construction, and funding for business plan;
TCC	Training and support services;
ANHB	Funding and consultation;
RMW	Help with repairs;
Engineering Consultant	Feasibility planning, facility design and construction; and
Business Consultant	Accounting training and utility business plan.

During the project the utility manager worked well with the supporting agencies: RUBA, VSW, TCC and ANHB. These agencies provided assistance fairly often and were available for phone consultations. The involvement of the partnership team during the O&M Project period is described in the following sections. Only the activities by partnership team members related to the O&M Project are included.

### City/Tribe Cooperation (Part 1)

In the village of Tanana two separate governing entities operated parts of the community's water and sewer facilities. Both the City of Tanana and the Tanana Tribal Council identified new water & sewer facilities as the number one community priority. The funding agency, Village Safe Water, wanted to work with one organization during planning, design, construction and transfer of ownership of the new facility. Disagreements arose as to which organization would be the appropriate one. The two organizations agreed to meet to discuss their differences.

In January 1996, the city council and tribal council held a joint meeting to discuss the water and sewer project and decide which organization would operate the utility. At first there was some heated discussions about utility management, which soon shifted to talking about options available to work out a joint agreement. Several options were discussed and facts presented for each option. The councils adjourned to discuss the options among themselves. The meeting reconvened and motions were introduced to set-

up a non-profit corporation. This new organization would be the entity to deal with VSW regarding sewer and water projects. The paperwork to form Too'gha was submitted to the state agency in April 1996.

### **Utility Board**

Too'gha was established as a five member utility board. In the organizing papers, the board members are identified as two members representing the city (the city administrator and one member of the city council), two members representing the tribe (the tribal administrator and one member of the tribal council) and one member elected from the community at-large. The member at-large was elected during an election held in January 1996. In February 1996, the board held their first meeting. The city agreed to act as manager for the project funding until Too'gha established its own offices, accounts, etc.

During the spring of 1996, the board met with RUBA and VSW staff to discuss the formation of the utility and review the feasibility study for the laundromat. During these meetings the agency staff noticed that the board asked very good questions and made constructive comments. In the fall of 1996, the Too'gha Board adopted by-laws and articles of incorporation. The city, on behalf of Too'gha, applied for an O&M grant to hire a utility manager to expedite the process of establishing the utility and assuming operations of the existing and new facilities.

### **Utility Manager**

In July of 1996, the city was awarded the O&M Project. They advertised for a utility manager and received twelve applications. The city conducted interviews and hired the new utility manager. After ten days, however, they let him go because it was felt he was not right for the job or the community. The position was readvertised, and the new utility manager was hired in October.

During the fall of 1996 and winter of 1996/97, the utility manager attended training classes, worked with the RUBA staff to set up the accounting system, and initiated work on the personnel policies and transfer agreement. (See below for detailed descriptions of the utility manager's involvement in each of these subject areas).

In 1998, he was instrumental in working with several agencies (DCRA, ADEC and TCC) in producing a videotape which outlined the benefits of the "Introduction to Utility Management" workshop. The video was designed to help other utility managers understand the benefits of attending the course.

### **Training**

One week after being hired, the utility manager attended the Tanana Chiefs Conference "Introduction to Utility Management" workshop, which provided the fundamentals of utility operations and management. In November, he attended a 'Force Account' Workshop. In December 1996, he attended the Rural Alaska Sanitation Coalition Meeting and the Alaska Tribal Environmental Management Conference.

In the spring of 1997, the utility manager attended several trainings to improve his knowledge of financial management and utility operations. He attended a "hands-on"

four-day training class on QuickBooks Pro 5.0 accounting software with the RUBA staff. As part of the class exercise, he started setting up Too'gha's accounts. To improve his knowledge of utility operations, he attended an OIT level water treatment class. He also attended a Risk Management (insurance) seminar on a scholarship provided by the Alaska Municipal League Joint Insurance Assoc.

In the spring of 1999, the utility manager attended a second QuickBooks training to improve his skills and understanding of its functions. Throughout the two years, RUBA, LGS and TCC staff provided phone assistance and over-the-shoulder training during their visits to the village.

### **Financial Management**

In the fall of 1996, Too'gha and RUBA staff set up a manual accounting system for the utility. They also set up the office, filed for an Employer Identification Number and obtained Department of Labor information. The city continued to handle payroll for the utility. Too'gha and RUBA staff developed a working budget for the utility that was passed by the Board. With funds from VSW Too'gha bought a computer.

In 1997, the utility manager started setting up computer accounts while maintaining the manual accounts. The utility manager transferred everything from the hand ledger to the computer, using the Quickbooks accounting software. Though it was initially a challenge, with practice he began to get the hang of the software. The period of dual accounts provided training for the utility manager to learn how to manage the utility finances. It also provided a fallback if problems were experienced with the computer accounting. This, however, led to periods when neither system was up-to-date. As the utility manager's ability improved, this happened less often. During the transition, RUBA staff provided over-the-shoulder training during their site visits on how to setup the accounts, enter data and print out reports.

During Too'gha operations of the laundromat in 1997, revenues were collected in excess of RUBA's optimistic predictions. By the end of the year, the laundromat continued to improve management and collection of revenues. The laundromat user fees for the period October 1, 1996 to September 30, 1997 were \$40,362. They increased for the period October 1, 1997 to September 30, 1998 to \$55,001, a 36% increase.<sup>20</sup>

The utility experienced tight cash flow during the winter of 1997/98 because of increases in fuel and electric costs. This experience provided the utility a lesson in the seasonal nature of utility costs. The RUBA staff observed that this makes the utility especially susceptible to emergencies or large maintenance repairs that drain any cash reserves.

In January 1998, the city turned over all billing and collections of water and sewer accounts to Too'gha.

In December 1998, the RUBA staff reported,

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<sup>20</sup> *A Fiscal Case Study of the Water and Sanitation Systems in Nulato and Tanana*, prepared by Dr. Steven V. Campbell, University of Alaska Anchorage, prepared for the Institute of Social and Economic Research, University of Alaska Anchorage and the Alaska Native Health Board.

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“The non-profit was doing well, albeit suffering from a cash flow crunch during these winter months when fuel and electric bills are high. Barring any unforeseen circumstances or emergencies the utility should be able to tighten their belt and make it through the winter.”<sup>21</sup>

At the end of the following quarter (March 1999), the RUBA staff reported

“Too’gha finances have deteriorated rapidly since the end of last quarter. At the end of December Too’gha was showing a deficit of approximately \$1,700. This has increased to nearly \$12,000 as of March 31st. The primary reason for the rapid decline appears to be the electrical costs (which have averaged over \$2,000 per month for the last four months).”<sup>22</sup>

The high electrical costs were due to the main well going dry and pumping continuously through the line to maintain circulation and prevent freezeup of the line (see maintenance below).

In early 1999, due to the higher than expected operational costs, the utility manager cut reduced costs by laying off the alternate operator, and using wiser purchasing and scheduling. VSW assisted the utility by hiring the remaining operator to work on the construction of the new laundromat.

By early 1999, the utility manager had developed three sets of quarterly reports using the software. He used the accounting software to handle payroll and payroll taxes, pay all bills, and keep track of his vendors.

### **City/Tribe Cooperation (Part 2)**

Development of the agreement transferring the water and sewer facilities from the city to Too’gha took much longer than anyone anticipated. Initial work on the transfer agreement began in the fall of 1996 with an anticipated completion in April 1997. In the fall of 1997, the utility transfer and lease agreement was reviewed by the city council, Too’gha Board and RUBA staff. After several rounds of legal consultations and negotiation, attorneys for both parties seem to think a management agreement is preferable to a transfer.

Through much of 1998 work on the management agreement (as the document was renamed in 1998) progressed slowly. In the late fall, the Too’gha Board and the city approved the draft management agreement. The work turned to developing a schedule of assets and conducting an inventory. The management agreement was finally signed in 1999.

### **Planning**

In the spring of 1997, Too’gha received funding from VSW to hire a consultant to develop a business plan for the utility. Discussion about topics to consider in the business plan included: looking at the ‘ability to pay’ for utility services among communities

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<sup>21</sup> Rural Utility Business Advisor 2<sup>rd</sup> Quarter FY99 Quarterly Report, Tanana (Too'gha) Activity Report

<sup>22</sup> Rural Utility Business Advisor 3<sup>rd</sup> Quarter FY99 Quarterly Report, Tanana (Too'gha) Activity Report

members, addressing ‘sustainability’ of the utility, and helping Too’gha start off with an accurate appraisal of operating considerations.

Too’gha hired a business consultant in the fall of 1997. The business consultant assisted Too’gha with planning and presentation of the 1997 Too’gha annual meeting and gather information on utility finances. During the winter of 1997 and spring of 1998, the business consultant continued to work on the business plan. The final report includes a fifteen year business plan, a community survey and a financial analysis of the feasibility of the Too’gha operations for the long range.<sup>23</sup>

In the spring of 1998, the business consultant presented the business plan to the Too’gha Board. The report projected Too’gha will operate on a deficit of \$14,000 for the next three years.

### **Community Involvement**

Too’gha held its first annual meeting in the fall of 1997. It is estimated 100 people attended. The meeting started with a covered dish community meal. There were plenty of door prizes and some very impressive prizes for the winner of the logo and poster contests. After the meal, board members, staff, and guests were introduced. The consultants talked about the business plan and the community survey, emphasizing the importance of community input. Every adult received a survey. The contractor spoke about the plans for the new washeteria. The president of the utility opened the meeting for questions and answers. Most of the questions focused on the location of the facilities. Draft plans were posted, and the engineering consultant answered questions after the meeting. Overall, the gathering seemed to establish the utility as a viable organization in the community. The relationships between the Too’gha Board, the city council and the tribal council improved, in a large part due to the annual meeting.

The second annual meeting, in the fall of 1998, drew an estimated 65-100 people. During this meeting there was more community input, more questions and more concerns raised. People wanted to know more details about the facility. The engineering consultant gave a presentation on the washeteria, and the business consultant presented the business plan. The VSW engineer and her supervisor attended the meeting to listen to the residents comments about Too’gha’s operations and to the ensuing discussion.

### **Maintenance**

In 1996, extensive work was conducted to upgrade the existing laundromat. This work included installing a new heat exchanger and new water softener. Worn out or inoperative pipes and plumbing were repaired or replaced. Under Too’gha management, conditions at the laundromat improved. The facility was cleaner and better run.

However, the deteriorating conditions of the facilities continued to create on-going problems for the operators. The system is old and has specific recurring problems each year. Typically in March, when the weather begins to warm and the frost levels rise, there is an increased danger of freezing pipes that have been affected by ground

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<sup>23</sup> *Too'gha Inc.: Business and Financial Plan*, Prepared for Too'gha Inc., Tanana, Alaska and Village Safe Water, Alaska Department of Environmental Conservation, October 1998, prepared by WW&G Consultants, Fairbanks, Alaska.

movement from freeze-thaw cycles. In March 1997, the town loop of the sewer froze and could not be immediately thawed.

The RUBA staff noticed

“Too’gha is working hard to keep the system running. The existing laundromat is old and prone to breakdown, necessitating the robbing of parts from one piece of equipment to fix another. The line that connects the city hall building is frozen again (it freezes every year). This year the community has elected to ignore the problem. Last year considerable time and resources were spent in trying to unthaw it.”<sup>24</sup>

During a pump test on the new water well, water flow to the existing water well was affected. The existing well went dry. To maintain water flow for the utility, water was pumped from the new well into the existing well, and from there into the water distribution system. This dramatically increased electrical and fuel costs for Too’gha.

### **Project Outcomes**

Too’gha completed four of five of the workplan tasks by the completion of the O&M Project. The project outcomes include:

- Hired and trained a utility manager;
- Developed a management agreement transferring operations from the city to the nonprofit utility;
- Developed utility accounting system;
- Transferred accounts from paper to computer bookkeeping;
- Developed personnel policies and procedures;
- Obtained additional funding from outside the community for utility planning and operations; and
- Developed a utility business plan,

Early in the project one of the Too’gha board members observed that Tanana has millions of dollars for construction and none of the money is available for operations and management. In 1996, the O&M Project provided the funds to pay the personnel cost for one half of the utility manager position and one third of the operator position during the first year of operation. These funds were essential during Too’gha’s start-up. In 1997, the second O&M Project provided for one half of the utility manger’s personnel cost. These bridging funds provided the utility with the flexibility to focus revenues on improving operations and maintenance of the existing laundromat. These improvements lead to a 36% increase in laundromat revenues.

In Tanana the wide network of councils, utility staff, agency staff, consultants and customers worked to find a sustainable solution for operating the water and sewer utility.<sup>25</sup> The network has actively worked to create a financially viable and managerially

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<sup>24</sup> Rural Utility Business Advisor 3<sup>rd</sup> Quarter FY98 Quarterly Report, Tanana (Too'gha) Activity Report.

<sup>25</sup> The work with Too'gha is similar to Recommendation 3, Component III – ‘Identify and evaluate local operation & maintenance problems and successes to determine what types of assistance works best and

sound utility from the beginning. Due to the conditions of the older facilities one major maintenance repair can severally affect months of good planning and cost cutting.

In the summer of 1999, a fiscal case study was conducted to look in more detail at Too'gha's financial condition after a few years of operation. The study found

“Too'gha's overriding problem at the present time (summer 1999) is a cash flow shortfall which has the operation is (sic) running on the brink of insolvency. The grant money which has been used to finance operations has now run out and as a result Too'gha is having difficulty meeting its payroll and other obligations as they come due. This situation is putting considerable stress on the utility manager and other employees. Too'gha's very survival as a going concern depends on solving its cash flow problem.”<sup>26</sup>

A stand alone utility has certain benefits and limitation, it is clear the people and organizations involved with utility management in Tanana are trying the best they can to make Too'gha work.

The workplan task that was not completed by the end of the project period was the transfer of the facilities to Too'gha. This task was completed later in 1999.

### **Research Questions**

The table summarizes the outcome indicators for Tanana. The operator skills improved through RMW over-the-shoulder training (O&M Project funds paid a portion of the operators salary). All of the financial and utility management indicators improved. The O&M Project paid the utility manager salary (so Too'gha could have a staff person) while the RUBA, LGS, VSW and ANHB staff worked with him to improve each of the six indicators.

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why.' In the Governor's Council on Rural Sanitation. *Rural Sanitation 2005 Action Plan*. Juneau, AK: State of Alaska, Department of Environmental Conservation. 1998.

<sup>26</sup> *A Fiscal Case Study of the Water and Sanitation Systems in Nulato and Tanana*, prepared by Dr. Steven V. Campbell, University of Alaska Anchorage, prepared for the Institute of Social and Economic Research, University of Alaska Anchorage and the Alaska Native Health Board.

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<b>OUTCOME INDICATORS FOR THE VILLAGE OF TANANA</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	Partially	While the hours worked stayed the same, the alternate was laid off because of lack of funds.
Percentage of Scheduled Maintenance Activities	About the Same	Partially	Operator reports about the same from year to year.
O&M Policies, Procedures or Planning	About the Same	Partially	Utility has existing policies and plans; they have not put focus on manuals for old facility, looking more towards new.
Operator Skills	Improved	Significantly	The operator increased experience, but did not pass certification exams.
O&M Resources (Tools, Parts & Supplies)	Increased	No	The city and community members donated parts and tools to the utility (~\$21,000 value).
Condition of the Facilities	Improved	No	Most of the improvements came from agency funding for new construction. The existing facilities had more difficulties and increased operational costs.
<i>Financial and Utility Management</i>			
Collections	Increased	Significantly	It is reported Too'gha has 100% collections.
Cost Efficiency	Decreased	Partially	Maintenance does improve facility, however age of facility led to increases in maintenance costs.
Financial Management	Improved	Significantly	Utility manager attended trainings; RUBA staff provided training and utility manager shifted accounting from paper to computer.
Utility Management	Improved	Significantly	Started operating the utility, established manager practices.
Utility Policies, Procedures or Planning	Improved	Significantly	Developed personnel policy, strategic plan and utility ordinance with help of RUBA and consultant.
Community Involvement	Increased	Significantly	Both city and tribal council supported project. The utility used a process of informal community education and annual meetings to increase support.

The collections increased due, in part, because customers learned the importance of paying their utility bills. Cost efficiency improved due to Too'gha and RMW improvements to the existing washeteria. Financial and utility management improved due to the efforts of the utility manager and assistance from RUBA staff. Utility policies improved due to the efforts of the utility manager, assistance from RUBA staff, funding from VSW for the business plan. Community involvement increased because of the Too'gha's annual meeting and their informal process of community education. The efforts by Too'gha and several agencies lead to an overall increase in seven of the twelve indicators.

The factors we believe contributed to the Too'gha's capacity to accomplish the project outcomes includes:

City and tribe agreed to work together;

Funds that could be used for utility operation and maintenance;

Agencies contributed additional funding for utility planning and Too'gha applied for additional funding;

Agency staff support for training and advice; and

Perseverance of Too'gha staff throughout the transition.

### **Long-term Effects**

During this project there were several ebbs and flows of success and setbacks. The two-year project also provided a chance for ISER to track the reality of improving water & sewer utilities over a multi-year period. There are four areas we believe are important to consider for long-term success of this project.

First, Too'gha has firmly established its utility and financial management capabilities and demonstrated its ability to adapt to changing conditions. The O&M Project funds provided the critical 'seed' funds to pay personnel costs while the utility consolidated its activities.

Second, the continuing support by RUBA and RMW staff form an 'extended' staff for Too'gha that lowers it's personnel cost.

Third, the new laundromat should contribute to increased revenues with a commensurate decrease in maintenance costs. These increased revenues may partially replace the O&M Project funds or other grant funds that have been paying personnel costs.

Fourth, small rural water and sewer utilities typically can not generate enough revenue to cover costs. Too'gha has covered the first three years of projected deficit through grant funds. It is unclear to what extent the city or tribe are willing to provide operating subsidies to Too'gha during those years when costs exceed revenues.

## Unalakleet

Unalakleet is an Inupiaq village located on the eastern shore of Norton Sound, at the mouth of the Unalakleet River. Many of the residents live a traditional subsistence lifestyle. The village is the sub-regional center; the headquarters of the Bering Strait School District is in Unalakleet. There are two forms of government: the City of Unalakleet, a municipal second class city, and the Native Village of Unalakleet, a federally recognized tribe. The city operates the water and sewer facilities.

The water system is one of the first village water systems designed and built by the Public Health Service. Additional filtration was added in 1997 to meet the requirements of the surface water treatment rule. During the winter of 1996-97 there were major freezing problems which caused the line from the water source to break. The water plant treats an average of 72,000 gallons per day. The estimated water use is 89 gallons per person per day. The sewer system was built in many phases. Lift stations have different pumps because they were built in different phases, and the pumps were not standardized.

In 1997 the village population was 803. The 1990 median household income was \$34,531. The First Year Report provides detailed background information on Unalakleet, its water and sewer system, operations, maintenance, and management.<sup>27</sup>

### Project Plan

The City of Unalakleet requested \$35,000 to carry out a workplan with the following tasks:

*Partnership Team.* The City of Unalakleet will form a partnership team with: the Norton Sound Health Corporation sanitarian and remote maintenance worker, the ADEC Village Safe Water field engineer, and the ANHB project manager. Within the city, people who will work on this project include: the city administrator, public works director, water and sewer plant operator, city clerk and city council.

*Utility & Financial Management.* The city will improve management of the utility, through the purchase of software and installation on the city computer. The software will track preventative maintenance, inventory of parts, work orders, purchase orders, and maintenance records for specific equipment. Additional activities include training of staff on the use of the software and data input. This activity also includes purchase of billing software, and any additional hardware, for the city to be able to generate the water and sewer bills.

*Facility Improvements.* The city will identify equipment that will provide continuous monitoring of selected parameters (such as: water temperature, water pressure, or turbidity), purchase equipment, install equipment, and train the operator on how to use the equipment. Additional equipment under consideration includes an auto dialer to

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<sup>27</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

notify a phone tree (of city staff) when the water system operates outside a set of defined criteria.

*Parts & Supplies.* The city will inventory spare parts, identify critical spare parts, order critical parts as needed, and coordinate data entry of maintenance management software.

### **Project Implementation**

The project began July 1, 1997, was granted two extensions and completed December 31, 1998. The city used \$31,571 (90% of the grant award), with a community match of \$31,571.

### **Partnership Team**

At the start of the project the city worked with the VSW Engineer and the ANHB staff to identify available software and equipment. The city contracts with a business management company in Anchorage that helps with their computer hardware and software purchases and maintenance. These three organizations assisted the city with the workplan task related to the software purchase.

Later in the project, after the city manager resigned (see turnover below), the interim city manager worked closely with the RMW to make repairs to the system. The RMW recommended several contract electricians to carry out the repairs. The interim city manger reported in a quarterly report,

“(The) Remote Maintenance Worker stationed in Nome was an invaluable asset to the City. (He) not only steered the City in the right direction for building inventory for it’s pumps and motors but also was instrumental in bringing in certified electricians to make the City’s water plant stand-by power operable. And to top things off (he) conducted an operator training course in the City for employees of the various communities in the region.<sup>28</sup>”

The city worked with the VSW engineer and ANHB staff to identify an appropriate turbidity meter to purchase.

### **Financial Management**

The city, up until 1997, had been using the Unalakleet Electric Utility computer and software for the city’s water & sewer billings. One of the primary tasks of the O&M Project was the purchase, install, train staff and operate the new billing software. In the grant application and workplan the city made a preliminary selection of the Qquest Maintenance Management Software.

Based on the research conducted after the start of the O&M Project the city purchased the “Aquillium” water & sewer billing software. The city clerk’s computer was upgraded to handle the new software that was installed in late December 1997. Training on the new software occurred in January and February 1998, with the first set of water and sewer bills sent out in March. During the next several months the city

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<sup>28</sup> Cover letter for quarterly report, City of Unalakleet to the Alaska Native Health Board, January 27, 1998 (the text indicates date should be 1999).

experienced problems with the new program. An example of a problem, the program can not relate meter readings vs. flat rate.

In the beginning of 1999 the city purchased a new computer for the city clerk. The billing software was re-installed. The problems with the software continued. The city, in their conversations with the software phone-support found they did not understand water and sewer costs and billing. By the end of the project the city had completed transfer from the electric utility billing system to the city's. Even with upgrading their computer hardware they still experienced some difficulties with the software.

### **Utility Management**

Prior to the start of the O&M Project the city identified a need to purchase utility management software. The purpose of the software was to combine purchasing, billings and collections in one software package. The utility management portion would provide a means to track purchasing, delivery and inventory control. A new computer was purchased late in the project period (October to December 1998) for the water plant operator to produce data on systems operation. By the end of the project it is unknown to what extent the operator had the skills or the time to use the computer to set up the software and input information.

### **Maintenance**

The RMW conducted two site visits, one in September 1998 and one in October 1998. The RMW inspected the facility and developed a series of recommendations. One recommendation was for the electricians from Nome to visit Unalakleet to walk through the facilities. In early October 1998, the electricians conducted a review of the lift stations, emergency generator and wiring in the water treatment plant. They provided the city with a list of parts and supplies to purchase. The city purchased the parts. Once the parts arrived the electricians returned to make the necessary repairs.

By the completion of their work, one stand-by generator was operational. It was re-wired so it is now capable of providing power to either of two lift stations or the water plant during a power outage. Circuit breakers were installed at two lift stations and one pump was repaired and replaced.

The city purchased a turbidity meter and installed it at the Powers Creek pump station as part of the station upgrade.

### **Parts & Supplies**

During the project the city held several discussions with members of the partnership team (see above) to identify the types of parts and equipment to purchase. The city was able to purchase these parts and equipment because of the O&M Project. The parts and supplies purchased included pumps and circuit breakers. The city now has spare pumps and motors on hand to replace any breakdowns in the water plant or lift stations.

## **Turnover**

Staff turnover occurred in every city position working on this project. The first staff person to leave was the Public Works Director. He resigned during development of the work plan in June 1997. The assistant public works director replaced him immediately. In Unalakleet the public works director and his assistant also handle the water and sewer operator duties. The city hired a new Assistant Public Works Director in the winter of 1997/98. The city clerk went on maternity leave in early 1998. The interim clerk started right away. The city manager resigned in July 1998, she had nine years experience. An interim city manager started soon after she left. A new city manager replaced the acting city manager in December 1998.

## **Project Outcomes**

The City of Unalakleet completed all of the workplan tasks. The project outcomes include:

- Purchased, installed and operated new utility billing software;
- Installed turbidity meter near well field;
- Purchased parts for maintenance of facility;
- Repaired stand-by power generators for utility; and
- Repaired of sewer lift station pumps.

At the beginning of the O&M Project the city focused on purchase and replacement of the billing software. During the middle of the O&M Project the city focused on making the software work. At the end, the focus turned towards parts and equipment purchases for maintenance of the facility. The turnover within the city staff slowed, but did not stop, project implementation.

## **Research Questions**

The table summarizes the outcome indicators for Unalakleet. The O&M resources and condition of the facilities improved because the O&M project provided the funds to purchase parts and hire an electrical contractor while the RMW provided expertise. Financial management improved as the city assumed its own billing capability, despite problems with the software. The efforts by the city and several agencies lead to an overall increase in four of the twelve indicators.

The collection rate decreased during this period. The record does not indicate why this change occurred. Possible reasons include: poor fishing season leading to customers having less income, trouble with the billing software leading to the city clerk having less time to pursue collections, or staff turnover in the city manager and city clerk position leading to a change in customer promptness in paying. (The person who was city manager at the beginning of the project had made a focused effort at the beginning of her term to significantly reduce the delinquency rate.)

OUTCOME INDICATORS FOR THE VILLAGE OF UNALAKLEET			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	Increased	No	The operator hours increased from 35 to 36 hrs/wk.
Percentage of Scheduled Maintenance Activities	Increased	No	Operators increased hrs maintenance from 0.5 to 2.0 hrs/wk. after completion of repairs to broken water line in 1997.
O&M Policies, Procedures or Planning	About the Same	Insufficient Information	Data collected did not identify any changes.
Operator Skills	Increased	No	The RMW conducted a training workshop in Unalakleet, both operators passed.
O&M Resources (Tools, Parts & Supplies)	Increased	Significantly	City bought replacement parts with grant funds, based on RMW recommendation.
Condition of the Facilities	Improved	Significantly	Installed turbidity meter, repaired sewer-lift stations, and standby generator.
<i>Financial and Utility Management</i>			
Collections	Decreased	No	The percentage of household customers 90 days or more late in paying utility bills increased from 10% in March 1998 to 22% in June 1999.
Cost Efficiency	Increased	Significantly	No direct numbers on savings. Improvement the condition of facility and training are anticipated to save the city money.
Financial Management	Improved	Significantly	City purchased billing software with grant funds. However, problems with software may be increasing the time to conduct monthly billing.
Utility Management	About the Same	Partially	No significant changes during the period.
Utility Policies, Procedures or Planning	Improved	No	City passed a rate increase in January 1999, first rate increase since 1996.
Community Involvement	Increased	No	Customer awareness increased after water line freeze-up in January 1997.

The factors we believe contributed to the city's capacity to accomplish the project outcomes include:

Funds that could be used for utility operation and maintenance; and  
 Support from VSW, RMW and electrical contractor.

### Long-term Effects

Unalakleet is one of the first rural villages to get a water and sewer system. Maintaining a functioning, low cost utility has been one of the city's priorities to ensure community health and development. Even with this priority, the city has had difficulty generating revenue to pay for more than the basic operational costs. This project helped transfer the billing system from the electric utility to the city. The O&M Project funds also provided needed maintenance on the back-up power supplies for the water and sewage treatment plants.

While these tasks are critical for improved long-term operation of the water and sewer utilities it is too early to say what the specific long-term effect the O&M Project will have. The workplan task of repairing the back-up generators has the potential for long-term savings.

The new city manager, after completion of the project, described how “a good water and sewer system improves the whole lifestyle of the village -- starting with health.<sup>29</sup>” He also stressed the long-term vision of the leadership in Unalakleet during the 1960’s and how it is now paying off in terms of community health and development.

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<sup>29</sup> Evaluation of Overall Program, ISER Phone Interview with Unalakleet city manager July 15, 1999.

## Venetie

Venetie is a Gwichin village located on the north side of the Chandlar River. The villagers live predominately a subsistence lifestyle, depending on salmon, whitefish, moose, caribou, ducks, geese and berries. There is one form of government: the Native Village of Venetie, a federally recognized tribe. The village council operates the water and sewer facilities.

Water is pumped from a well near the Chandlar River, treated and stored in a 325,000-gallon storage tank. Water used to be distributed through two circulating loops. Individual household septic systems were installed in the early 1980's. Both water distribution loops and the septic systems froze in the early 1980's. Residents currently haul water and use honeybuckets.

In 1997 the village population was 241. The 1990 median household income was \$14,688. The First Year Report provides detailed background information on Venetie, its water and sewer system, operations, maintenance, and management.<sup>30</sup>

### Project Plan

The Village Council requested \$37,271 to carry out a workplan with the following tasks:

*Partnership Team.* The council will form a partnership team consisting of the Chief of Venetie Village Council, the RMW, the water plant operator, the community health aide, Venetie Village Council utility manager, the ANHB project manager, the washeteria manager, and the planner for Council of Athabascan Tribal Governments.

*Utility Manager.* The council will hire and train a utility manager.

*Utility Management.* The council will improve overall management of the water and sewer system to make it pay for itself. They will also conduct a cost study and analysis of the operation to determine ways to lower costs of operation. They will establish a pricing policy to ensure users are paying for the costs of operating the system.

*Customer Education.* The council will obtain training so it gains a better understanding of utility management. They will also educate the community to become more aware of the costs of utility management and benefits of having the system.

*Utility Management.* The council will develop plans, policies, and procedures as appropriate and necessary.

*Revenues.* The council will research and seek appropriate funding sources to maintain the long-range sustainable operation of the system and provide for system upgrades and expansions.

*Parts and Supplies.* The council will inventory and identify water and sewer system parts and tools and purchase replacements.

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<sup>30</sup> Institute of Social and Economic Research, Evaluation of the Alaska Native Health Board Sanitation Facility Operation and Maintenance Program: First Year Report on Phase II Projects, Volume II, prepared for U.S. Environmental Protection Agency, Region 10, 1997.

## **Project Implementation**

The project began August 1, 1997 and was closed July 31, 1998. The tribal council used \$9,320 (25% of the grant award), with no community match.

### **Partnership Team**

A representative for the village council worked with ANHB staff during June to August 1997 to develop a workplan. He then presented the workplan to the village council for review and approval in August 1997. During the fall of 1997 ANHB staff talked with the village council representative about progress on the O&M project. After tribal council elections in January 1998, the new First Chief discussed possible modifications to the workplan. The modifications were never followed through.

The RMW discussed with ANHB staff the possibility of using the O&M project funds for parts and supplies.

ANHB staff had several conversations with village council members and the village council representative during the spring and fall of 1998 about moving forward with the O&M project.

### **Utility Manager**

During the fall of 1997 the village council reviewed a job description for the utility manager position. In mid-November the position was advertised in the village. The utility manager was hired in early 1998. There were no community quarterly reports or other sources in the record that provide any information on her work activities during the project period.

## **Project Outcomes**

The Venetie Village Council worked on two of the tasks and completed none of them. The project outcomes include:

Hired a utility manager and  
Held discussions with ANHB staff on how to improve utility management.

Apparently the village council or its representative took very little action on this project other than hiring a utility manager. Because the village council had no administrator, the utility manager had no supervision. The ANHB staff talked with the village council representative several times to discuss the project and work with them to carry out the workplan tasks. There was even discussion of revising the workplan so it would be more aligned with the new chief's priorities. However, there was no follow through to carry out revisions to the workplan.

## **Research Questions**

The table summarizes the outcome indicators for Venetie. None of the indicators improved or increased as a result of the O&M project. The efforts of the operators and RMW lead to the two increases during the project period.

<b>OUTCOME INDICATORS FOR THE VILLAGE OF VENETIE</b>			
Indicators	Change During the Period	Change Caused by the Project	Comments
<i>Operation and Maintenance</i>			
Operator Hours	About the Same	No	Operator works 3 hrs/day seven days a week.
Percentage of Scheduled Maintenance Activities	About the Same	No	Estimated at 5 hrs/wk.
O&M Policies, Procedures or Planning	About the Same	No	No change during the period.
Operator Skills	Increased	No	New operator started working.
O&M Resources (Tools, Parts & Supplies)	Increased	No	The washeteria has more parts available than previously.
Condition of the Facilities	About the Same	No	No change during the period.
<i>Financial and Utility Management</i>			
Collections	Unable to Determine	Insufficient Information	Not enough information available.
Cost Efficiency	Unable to Determine	Insufficient Information	Not enough information available.
Financial Management	Unable to Determine	Insufficient Information	Not enough information available.
Utility Management	Unable to Determine	Insufficient Information	Not enough information available.
Utility Policies, Procedures or Planning	Unable to Determine	Insufficient Information	Not enough information available.
Community Involvement	About the Same	Insufficient Information	No change during the period.

### **Long-term Effects**

Based on the information available in the record, the O&M project provided no long-term improvement for the village of Venetie. The ANHB process of community capacity building is to work with the community at the village's specific O&M capability. Once the process is initiated (though the site-visit and workplan development) ANHB staff worked with the village council representative at the pace, or priority, of the village staff. While the goal is completion of the tasks developed in the workplan, the focus is working with the community to develop capacity. Venetie is an example of where this approach did not lead to a completed project.

From the record, it appears that the lack of a paid village administrator whose job responsibilities are to run the operations of the village meant there was no staff person to ensure the workplan activities were carried out. It also appears, from the information available in the record, the changes on village council led to different priorities for implementing the workplan. This led to lack of consistent focus to ensure the workplan was carried out.