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Rural Utility Cooperative (RUC): Final Evaluation Report

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Rural Utility Cooperative (RUC)

Final Evaluation Report

Prepared by:

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Prepared for:

Alaska Native Tribal Health Consortium

Division of Environmental Health and Engineering

Department of Tribal Utility Support

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October 2007

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Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
AICP	American Institute of Certified Planners (American Planning Association)
ANILCA	Alaska National Interest Lands Conservation Act
ANCSA	Alaska Native Claims Settlement Act
ANTHC	Alaska Native Tribal Health Consortium
APA	American Planning Association
ARUC	Alaska Rural Utility Cooperative
AUSC	Alaska Utility Supply Center
CIEH	Chartered Institute of Environmental Health (London)
DCCED	(Alaska) Department of Commerce, Community, and Economic Development
DEHE	(ANTHC) Division of Environmental Health and Engineering
DPDP	Division of Policy Development and Planning
EPA	U.S. Environmental Protection Agency
gal	gallon
gpd	gallons per day
gppd	gallons per person per day
ISER	Institute of Social and Economic Research
KPI	Key Performance Indicator
MHHI	Median Household Income
MOA	Memorandum of Agreement
NEHA	National Environmental Health Association
O&M	operation and maintenance
PCE	Power Cost Equalization
RCA	Regulatory Commission of Alaska
RIPH	Royal Institute of Public Health (London)
RMW	Remote Maintenance Worker Program
RUBA	Rural Utility Business Advisor Program
RUC	Rural Utility Cooperative
SNC	Significant Non-Compliance List
SUA	Statewide Utility Association
THO	Tribal Health Organization
TUS	Tribal Utility Support
WPO	Water Plant Operator
Y-K	Yukon-Kuskokwim
YKHC	Yukon Kuskokwim Health Corporation

Executive Summary

Introduction

The Rural Utility Cooperative (RUC) Final Evaluation is designed to answer several interrelated questions:

- Is the RUC working as envisioned?
- Is it making an impact in the RUC Communities?
- Are the RUC Communities better off than the Non-RUC communities?

Whereas the interim report was conducted with the goal of determining the RUC pilot project's value added through 2005 as well as collecting baseline data for future evaluation of RUC prospective communities, the final evaluation has built on the framework developed for that assessment. We have identified areas such as operator satisfaction (pay and turnover) and advantages such as staying off the Significant Non-Compliance List (SNC List) and in regulatory compliance, making bulk fuel purchases through the RUC, and effective billing and collections policies where RUC villages continue to make improvements. These RUC management parameters are moving the villages towards sustainable operations. The RUC concept also has an inherent advantage in that a system or "roadmap" has been initiated for community capacity development. The RUC has an opportunity to build a structure that can take advantage of collaboration and foster unique and effective partnerships with funding and regulatory agencies. This assessment builds on additional fieldwork completed in June 2007 and a comprehensive assessment using key performance indicators, as well as interviews with key RUC and programmatic Alaska Native Tribal Health Consortium (ANTHC) managers.

The RUC currently consists of the following eight villages:

- Grayling
- Holy Cross
- Russian Mission
- Toksook Bay
- Upper Kalskag
- Chevak
- Lower Kalskag
- Goodnews Bay

Additional resources for RUC planning and management are included in the appendices. Appendix A presents the Denali Commission funding proposal. Appendix B provides the context for RUC planning using a Chronology of Events, Laws, and Milestones. It is visually illustrated in Figure B-1 – RUC Development and the Impact of Events on Rural Alaska Sanitation, located in Appendix B.

Appendix C lists the former and prospective RUC villages in addition to the current villages managed by YKHC, and Appendices D and E have budgets for the RUC villages, who are member communities of the YKHC pilot RUC Program. Finally, Appendix F contains a list of key stakeholders pertaining to Alaska rural utility provision.

Methods

The evaluation was conducted by a team of experienced utility operation and maintenance professionals led by independent reviewer/ consultant Dr. Steven Konkel. The team initially expanded upon the 2002 Martin Consulting report, identifying Key Performance Indicators (KPIs) in a framework for the interim evaluation. This Final Evaluation Report focuses on eight KPIs: affordability, qualified operators/operations, water production, population and operable connections, user fee collection percentage, electrical use and cost per kilowatt-hour/fuel consumption plus fuel cost per gallon, community capacity development, and regulatory compliance. The assessment also includes a metric comparing RUC and non-RUC villages using the criteria developed in the Martin report; this is included following section 5.8.

Results

- **Affordability:** All RUC utilities charge about, slightly less than, or below the generally-accepted affordability standard of 4.5 percent or 5 percent of median household income. Entities conducting applied research on affordability, such as the Regulatory Commission of Alaska (RCA) and the Institute of Social and Economic Research (ISER) of the U. of Alaska Anchorage, have found nationally that rates above 4 to 5 percent of median household income (MHHI) may be considered problematic. In comparing Alaska to nationwide studies of water and sewer utilities, there are unique challenges which make providing sustainable operation and maintenance somewhat different from the “Lower 48” states. In Alaska, the cost of service delivery, weather and year-round access, cost of delivered fuel and electricity, and maintenance challenges (“Small problems loom large on the tundra,” Remote Maintenance Worker Wally Wallace, 1998) combine with the lack of a sustainable economic base in rural Alaska to drive higher utility costs. In addition, subsistence lifestyles and the Alaska Permanent Fund Dividend program are unique to Alaska; both may be considered in developing incentives to collect utility revenues. The challenge of bringing the public health benefits of a clean drinking water supply and sanitation facilities to Alaska’s villages has been visible as a public policy priority for literally decades.

The RUC has designed a pathway for villages to make significant improvements toward sustainability as well as to move from water haul and honey bucket collection to viable piped water and sewer systems. It envisions being able to work not only within and across boundaries within a utility organization, but across organizations serving rural community needs.

Water and sewer billing rates increased in July 2007 in RUC communities; these rates range from \$40 a month in Goodnews Bay, to \$50 per month in Upper Kalskag, to \$70 per month

in Grayling, Lower Kalskag, Russian Mission and Toksook Bay, and \$85 per month in Chevak and Holy Cross. In addition, the City of Holy Cross has levied a 15 percent surcharge on utility bills to raise additional revenue for the City. Collection rates should be monitored to ensure that surcharges are not significantly affecting collection rates, and total RUC revenues generated by the communities with surcharges are meeting RUC requirements.

- **Qualified operators/operations:** RUC villages appear to have water plant operators (WPOs) who are very qualified to run the water plants. In some cases, particularly Grayling, it appears that the trend in water plant operator competence and desire to achieve certifications has been much better than in the pre-RUC period. Nevertheless, there has been a significant turnover in Grayling water plant operations recently as well as in an administration position in the village; this may be characterized as a temporary setback to achieving higher levels of community capacity development (discussed below). In general, RUC communities have experienced WPOs who have gained additional wages plus benefits as part of the RUC community. The graphics included in this assessment show that significant improvements have been made over pre-RUC wages. The RUC provides support to WPOs who want to increase their certification level; villages like Chevak have several WPOs where new operators can learn from their more experienced colleagues. Building capability of WPOs in rural Alaska is a challenging undertaking, especially in the non-RUC villages.
- **Water production:** Water production varied significantly between RUC villages. Water production for both Grayling (population 174) and Chevak (population 908) was around 750,000 gallons per month in April 2007, despite the much greater population in Chevak. Sometimes lowering water production in RUC communities can indicate leaks in the system have been identified and fixed and water is more efficiently produced. Managers can monitor per capita gallons per day (gpd) consumption to assure that the benefits of a clean drinking water supply are achieved. Internal analyses at DEHE suggest that villages with per capita water production in the range of 25-32 gpd are likely generating the expected public health benefits. In Goodnews Bay, per capita water production is 9 gpd from a groundwater water supply source. This is not atypical for a village with water haul versus a piped system into houses. At the other end of the spectrum lies Grayling, whose per capita production is 142 gpd; this indicates that there likely are very significant leaks in the system, which can be very costly to excavate and fix. Grayling, like Alakanuk, has a surface water supply source.
- **Population and operable connections:** RUC community populations have remained relatively static since 2000. Typically, the number of residential connections is much greater than for the other categories of connections such as institutional or commercial customers. In Russian Mission and Upper Kalskag, there is only one institutional customer (the school), whereas Holy Cross has eight commercial customers and five institutional customers. Due to the small size of the RUC villages, the number of connections and residential customer billings and collections can be very important to RUC operations. Also, disconnection policies, such as reconnection fees, can be labor intensive, so finding ways to increase collection rates is a key to becoming a viable member of the RUC.
- **User fee collection percentage:** Collection rates have improved significantly under RUC management. The longer the communities are in the program, the better the collection rate is.

The collection rates of the three original communities are close to 100 percent for fiscal year 2007. An increase in monthly rates became effective in August 2005. In early 2007, rates were again increased. This final evaluation includes YKHC budget figures for 2006 (Consolidated Village Budget, Appendix D) and for 2007 (RUC Community Annual Budgets, Appendix E). Collection revenue should be carefully monitored, both on a month-by-month basis and for the cumulative collection percentages. The connection with the affordability variable is apparent from the discussion above. Revenue generation helps to fund salaries and benefits for WPOs and ensure parts and remote worker availability for sustainable operations. Grant monies have been applied to build capacity rather than to provide an on-going subsidy for operations such as the Power Cost Equalization (PCE) program affecting electricity bills in many rural communities not included in the four dam hydroelectric program.

- ***Electrical use and cost per kilowatt-hour/fuel consumption and fuel cost per gallon:*** The cost of energy represents 25.4 percent of the utility operations budget. The bulk fuel purchase program was able to save a lot of money on fuel purchases. Whereas the average fuel price for non-RUC villages was \$5.25 per gallon, recent figures for the RUC villages averaged \$3.27 per gallon (a 38 percent savings in fuel costs. Sometimes villages have to pay large premiums for fuel delivery in winter months, and air delivery, though expensive, is the only viable option. In addition, the ability to take advantage of bulk fuel purchases is sometimes limited. In Holy Cross, for example, additional fuel storage capacity is needed. This is the reason that Holy Cross' fuel cost per gallon was \$5.25 per gallon in April 2007.
- ***Community Capacity Development:*** All RUC communities have been on a similar roadmap toward community capacity development, as envisioned in the initial concept planning, interim evaluation report, and lessons learned documents prepared for funders. These efforts range from general housekeeping and spare parts storage (evident from the pre-RUC beginnings and current status verified in site visits at Grayling) to the overall results in RUC villages such as Toksook Bay, where the utility is being integrated into improved infrastructure for the village as a whole (bulk fuel storage, wind generator production, new service connections). The Statewide Utility Association (SUA) runs a billing and collection program, and the Alaska Utility Supply Center takes advantage of its buying power to lower the costs of spare parts, such as pumps. The Remote Maintenance Worker program provides the water plant operators with knowledge and ability to fix problems without having that expertise within the village itself.

The Rural Utility Business Advisory program (RUBA) has developed 27 essential indicators. The 27 indicators fall under accounting, finance, Internal Revenue Service problems, Workers Compensation Insurance, Organizational Management, and Operation of the Utility (which includes indicator number 26: The Utility Operator(s) are actively working towards necessary certification; and 27: The Utility has a preventative maintenance plan developed for the existing sanitation facilities.)

Analysis of these indicators for RUC villages (conducted by Chris Kiana, Utility Business Advisor for ANTHC) shows a progression over time for the current RUC villages as well as Alakanuk and Kwethluk, which have built some capacity during their stint in the RUC.

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Lower Kalskag and Goodnews Bay, both RUC villages, had significant problems meeting almost all of the indicators in the last quarter of 2006 (9-12, 2006) as well as in the first quarter of 2007 (1-3, 2007). An inherent advantage of the RUC is that communities can receive assistance to pass the essential RUBA indicators. For example in Goodnews Bay and Lower Kalskag efforts in the second quarter of 2007 (4-6, 2007) resulted in overall pass of the RUBA assessment in the third quarter, as shown in Figure 5-8. RUC managers work with the communities to improve these indicators, building community capacity. RUC villages are in much better shape in meeting RUBA's essential indicators, and RUBA has been a valuable collaborator with funders in moving the RUC villages forward in their community capacity development.

- **Regulatory compliance:** All RUC communities were in moderately good regulatory standing at the time of the evaluation. The major conclusion for this key performance indicator is that the RUC communities are working on moving off the SNC (Significant Non-Compliance) List, while non-RUC communities may struggle with the many rules of the Alaska Department of Environmental Conservation (ADEC) dealing with surface water treatment, arsenic, bacteriological and other sampling and remedial measures, and recordkeeping and reporting. Non-RUC communities are 1.78 percent more likely to be on the SNC list.

Another regulatory and administrative advantage of the RUC concept deals with certifications by the Regulatory Commission of Alaska (RCA). RCA certifies villages to perform water and sanitation services. This includes a public certification of need. The RUC communities save money on the certification process as well as certificates for operation. In addition, RCA certification enables communities to qualify for grants for capital projects. The RUC pays one fee, rather than a fee for each service or each village. This provides the RUC with an economy of scale in the certification arena.

Taken collectively, these KPIs demonstrate that RUC communities are operating as envisioned, taking advantages of economies of scale and planning for electricity and fuel use, through mechanisms such as bulk fuel purchasing. The RUC has demonstrated the value of integrating the efforts of the RUC manager, Remote Maintenance Worker (RMW) Program, and the needs of the WPOs to keep water and sewer plants functioning well. The impact ranges from major improvements in places such as Toksook Bay, as compared with coastal non-RUC villages such as Scammon Bay, to logistical and organizing improvements at Grayling, which may be compared to many non-RUC villages. Often there is little inventory and practically no organized approach for additional spare parts such as pumps, which can run around \$5,000 each. RUC villages have access to the resources of the Statewide Utility Association and the Alaska Utility Supply Center (AUSC). The RUC also promotes organizing spare parts inventories and planning for contingencies.

Comparison of RUC versus non-RUC communities can be done using the Martin consulting metric described in detail in the Martin report (2002). Compared to the non-RUC villages, it appears that RUC communities are performing quite well, with current RUC villages receiving top scores in the Yukon-Kuskokwim (Y-K) Delta region.

Conclusion

The RUC management concept has many inherent advantages and has the promise to bring the public health benefits of a clean water supply to villages remotely located throughout the Y-K Delta region. One challenge for the RUC villages is to show continual improvements leading toward sustainable water and sewer operations, an elusive goal over the last 50 years throughout the Y-K Delta region. The pilot effort demonstrates some of the inherent advantages of collaboration, planning, and management efforts in this arena; it likely will inspire efforts to create a statewide Alaska Rural Utility Cooperative or Collaborative (ARUC). Lessons learned from the pilot can be translated into advantages for a statewide ARUC.

1.0 Introduction

This final evaluation of the Rural Utility Cooperative (RUC) operated by the Yukon-Kuskokwim Health Corporation (YKHC) was prepared as part of the pilot project in the Yukon-Kuskokwim (Y-K) Delta to develop and implement a model for successful operation and maintenance of community water and wastewater systems. The concept was initially proposed in November 2000 and subsequently funded in 2001. Key funding organizations include the Denali Commission and the U.S. Environmental Protection Agency (EPA), with a \$1.35 million proposed funding over four years of operation proposed in November, 2000. The year-by-year funding is detailed in **Appendix A: Denali Commission Funding Contribution Proposal: Regional Utility Cooperative – Proposed Demonstration Project**. In May 2002, Martin Consulting prepared a report, *Rural Utility Cooperative (RUC) Twenty Village Financial Survey*. The report focused on 20 of 48 communities located throughout the Yukon-Kuskokwim Delta region. An interim assessment was completed in November 2005, based upon fieldwork and analyses completed in July and August 2005. This final evaluation updates from our interim assessment regarding observations and data collected for that initial survey, and draws conclusions regarding the progress made by the RUC.

First, literature search and project document reviews were undertaken. Managerial records and extensive data sets were reviewed as part of this assessment of the relative progress of RUC villages. **Appendix C: Current Rural Utility Villages and Former and Prospective RUC Members (August 2007)** lists the eight current and four former and prospective RUC villages, along with the month/year the village joined the RUC. A key legal document, the “Regional Utility Cooperative Memorandum of Agreement (MOA),” has been signed by officials of each of the six RUC member villages and by officials of the RUC (Chairman and RUC Manager), as well as the President and Chief Operating Officer of the Yukon Kuskokwim Health Corporation (YKHC). This suggests the value-added nature of the partnership/cooperative. It spans from the village to YKHC through the overall direction, coordination, and utility planning leadership of the Alaska Native Tribal Health Consortium (ANTHC) Division of Environmental Health and Engineering (DEHE).

Chapter 7: References lists the documents that were utilized in this evaluation. In addition, Dr. Konkel, Troy Ritter (ANTHC DEHE), Kris Hadden (ANTHC DEHE), and Seth Smith (YKHC RUC Manager) talked with water plant operators (WPOs) in the following communities: Grayling, Holy Cross, Alakanuk, and Chevak, Scammon Bay, Chevak, Hooper Bay, Atmaukluk, Cheforak, Toksook Bay, Lower Kalskag, Upper Kalskag, Holy Cross and Grayling, during August 2005 and June 2007 field visits.

The rationale for selecting the villages for interviews and inspection of the water plant operations is very important. Villages were selected for the site visits on the basis of whether or not they would likely yield insights into obstacles facing rural Alaska in the provision of these utilities. Overcoming barriers to sustainability is a key element of the challenge facing RUC communities or other Y-K Delta region villages seeking to provide these services. Insights into the challenge of generating enough revenue to cover operation and maintenance (O&M) costs were evident from the site visits. Time and budgetary constraints precluded visiting more than a handful of the

20 or more villages at this time – including those noted in the Martin report, and other villages where Mayors or others have expressed an interest in learning more about the RUC concept and its implementation. On the site visits conducted in August 2005, we also interviewed key local officials, especially in Holy Cross (current RUC community) and Chevak (Prospective RUC community), where the Mayors made time for us. Extensive site visits are planned for the final evaluation, as there are observations and data that are best collected and verified through this fieldwork. The site visits also provide an excellent communication vehicle for interacting with the WPOs.

To provide a context for understanding provision of water and sewer systems in rural Alaska, we have developed **Figure B-1: RUC Development and the Impact of Events on Alaska Rural Sanitation** and **Appendix B: Context for Provision of Sanitation Services in Alaska: A Chronology of Events, Laws, and Milestones** that elaborates on the elements in Figure 1. We believe this provides a baseline of knowledge for understanding the “sustainability challenge” of providing clean water and wastewater treatment services in the Yukon-Kuskokwim Delta region of Alaska. It is also essential for understanding regional and statewide realities.

Appendix C: Current Rural Utility Cooperative Villages and Former and Prospective RUC Members (August 2007) contains key demographic and MHHI information for the RUC communities. The 2004 population is based on data reported by the State of Alaska Dept. of Commerce, Community, and Economic Development (DCED), published in community profiles.

Mr. Ed Lohr, Mr. John Spriggs, Mr. Troy Ritter, Kris Hadden, and Seth Smith provided data, access to resources, and logistical support. Ed Lohr and John Spriggs assisted with development of key performance indicators (KPIs) and acquiring the data required for compiling key performance measures, analysis, and technical evaluation of the RUC villages, without which it would not have been possible to address the issues covered in this interim evaluation of the development of the RUC concept and the progress made in the Yukon-Kuskokwim pilot demonstration implementation to date. We also collected and evaluated data using a metric proposed in the Martin Report; our conclusions on this measure are contained following section 5.8.

The results presented herein were gleaned from conversations with multiple individuals involved in the conceptualization of the RUC, from Ed Lohr, John Spriggs, and Karl Powers (YKHC), to several water plant operators (WPOs) involved in the day-to-day operations of the RUC utilities. There are many people to thank for their time and patience in answering questions and providing data during the site visits in the four villages. ANTHC DEHE Tribal Utility Support offices in Anchorage have a wealth of staff with expertise spanning environmental public health and engineering, as well as operations of utilities and billings and collections for villages. Michaela Straughn and the technical editing staff in DEHE provided superb logistic support in production and refinement of the tables and figures used in this report. Staff in the YKHC Office of Environmental Health and Engineering, including Karl Powers and RUC manager Seth Smith, offered their perspectives on challenges facing the RUC in August 2005 and June 2007.

The RUC members and “former and prospective RUC members” are readily accessible via charter flights based out of Bethel, weather permitting. With respect to factors such as village

size and the cost of operating utilities, these villages are typical of Alaska's more remote communities and the challenges that they face, especially when compared to provision of water and sewer in cosmopolitan population centers such as Anchorage, Fairbanks, and Juneau. Costs of fuel, transportation, and labor are definitely important in evaluating the economics of providing power, water, and wastewater treatment operations through the RUC. Usually these utilities are interrelated. For example, one person in a village can work with both water plant operations and in ensuring that the wastewater treatment operations are functioning properly.

The RUC has evolved over several years. One of the primary purposes of this report, the final evaluation, is to objectively identify progress and remaining challenges. We also took note of some of lessons learned identified by ANTHC DEHE. This Final Evaluation Report looks at where the villages participating as a RUC community stand today compared to where they started before this project began, or the conditions prevailing in their water supply systems just before they joined the RUC.

Finally, in this report we look at the issues affecting the potential for success in managing these utility operations and the implications for the implementation of the RUC concept in the Y-K Delta region. Successful demonstration of the concept for the current and prospective villages is well underway. The success and challenges of the RUC will have implications for other regions and/or cooperatives throughout Alaska, as provision of these services cannot be taken for granted in Alaska's remote communities. Other boroughs may be able to gain insights into whether the concept has promise in their own region based on the progress of the RUC to date. The concept may be modified to suit regional or statewide needs.

Comments on this report are welcome. Please send them along with your contact information to:

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Note on Dr. Konkel:

Steve Konkel worked as a policy analyst in the second administration of Gov. Jay Hammond (1978-82), where he analyzed energy and environmental programs and policies in the Division of Policy Development and Planning (DPDP) in Juneau. He earned his Ph.D. in Urban Studies and Planning at M.I.T, and holds a Masters in City Planning from Harvard University, as well as an S.B. in Architectural Engineering: Construction Management from the University of Colorado, Boulder. He is a Charter Member of the American Planning Association (APA), and has held the American Institute of Certified Planning (AICP) credential continuously since 1975.

In 2005, he presented "The Planner as Mediator: Dispute Resolution in the Public Policy Arena" as part of the Kentucky Chapter of APA Fall conference, held September 21-23, 2005 in Frankfort, KY. At the 70th Annual Education Conference and Exhibition of the National Environmental Health Association (NEHA), Commander Spriggs and Dr. Konkel presented a

paper on the RUC experience through June 2006, and its potential as a model for delivering sustainable water and sewer services in Alaska. This meeting was held at the Hyatt Regency in San Antonio, TX. The Spriggs-Konkel abstract was selected by peer reviewers for presentation in the Drinking Water technical session.

Dr. Konkel has worked at two national laboratories (Oak Ridge National Laboratory and Pacific Northwest National Laboratory), received academic appointments at three universities, and was awarded sabbatical funds by the National Environmental Health Association (NEHA) based in Denver, CO. and the Chartered Institute of Environmental Health (CIEH) in 2004 to study environmental health education in the United Kingdom. Dr. Konkel is currently NEHA Technical Session Chair, Environmental Health Research. In 2003 he was elected as Fellow of the Royal Institute of Public Health in London. He is currently based in Richmond, KY, 30 miles south of Lexington, in the rolling hills of Kentucky's beautiful bluegrass and thoroughbred horse country.

During Academic Year 2007-08, Dr. Konkel will be on sabbatical leave as a U.S. Fulbright Scholar based at Dublin Institute of Technology (DIT) in Dublin, Ireland. He is one of two U.S. scholars selected by DIT, and he will be a faculty member in the School of Food Science and Environmental Health.

2.0 Overview of the Interim and Final Progress Evaluations

This report is designed to answer several interrelated questions:

- Is the RUC working as envisioned?
- Is it making an impact in the RUC Communities?
- Are the RUC communities better off than the non-RUC Communities?

A team of experienced individuals with expertise in the conditions and challenges in rural Alaska produced the RUC Interim and Final Evaluations during intensive applied research and writing efforts. The fieldwork for the interim report was conducted in August 2005 and the fieldwork and analysis for the final progress evaluation were completed in June and July of 2007. Dr. Konkel's role in this process was to serve as a team leader and provide objective review and analysis of data, numerous reports, and snapshots of the YKHC operation and maintenance experience for the RUC pilot effort in the Yukon-Kuskokwim Delta region. The ANTHC team was particularly interested in the progress of the villages with RUC utilities over the past several years. (See the Figure B-1 timeline, paying particular attention to key RUC events – starting with the November 7, 2000 RUC proposal and dates of entry into the RUC of RUC villages.)

For analysis purposes, the first two villages that joined the RUC in July and August 2003 (Holy Cross and Grayling, respectively) were selected for the site visit fieldwork in both 2005 and 2007. Alakanuk was visited in 2005, while a prospective RUC village, Chevak, was visited in 2005 and again in 2007 (after it became a RUC village). The 2007 fieldwork also included non-RUC villages of Hooper Bay and Scammon Bay, on June 26, 2007. On June 27, 2007, Kris Hadden of ANTHC Tribal Utility Support (TUS), Seth Smith, RUC Manager of YKHC, and Dr. Konkel visited Atmaukluk and Cheformak (non-RUC villages) as well as Toksook Bay, one of the better performing RUC villages. On June 28, 2007, the fieldwork team chartered flights out of Bethel to Lower Kalskag and Upper Kalskag on the Kuskokwim and Graying and Holy Cross (as mentioned above) on the Yukon River. The purpose of the field work was to talk with the water plant operators (WPOs), ask questions about the value-added of RUC management to the daily water plant operations, and to reflect on the challenges and opportunities in providing safe water supplies and sanitation services in rural Alaska. We were able to successfully schedule and complete the ambitious fieldwork program with favorable weather conditions for the charter flights, although strong weather fronts and low ceiling conditions can be a problem, particularly for coastal villages (Please see Figures 2-1 and 2-2 of the YKHC Service Territory and air mile distances from Bethel (the regional hub). Fieldwork was conducted out of Bethel, the regional population center, in August 2005 and June 2007. We sought to visit coastal as well as interior villages in the Y-K Delta. The YKHC Service Territory includes almost 60 villages. Figure 2-2 (air mile distances from Bethel) illustrates the transportation challenges and logistics, as roads do not connect the villages, and even waterway transportation is seasonal. Figure 2-3 shows the so-called “honey bucket” communities versus flush toilets and piped drinking water systems and is indicative of the challenges ahead in bringing the public health benefits of sustainable water and sewer systems to this region of Alaska, and to the State of Alaska as a whole. The RUC

experience of YKHC is one that sheds light on obstacles likely to be encountered in managing water and sewer systems, the nature of operating utilities in villages managed by traditional councils, tribal councils, and/or city councils, and understanding how key performance indicators can assist those interested in sustainable operation and maintenance of water and sewer systems in Alaska.

Yukon-Kuskokwim Health Corporation Service Area Map





AIR MILES FROM BETHEL
(FLIGHT TIMES FROM BETHEL)*
 *In minutes, aboard Cessna 207

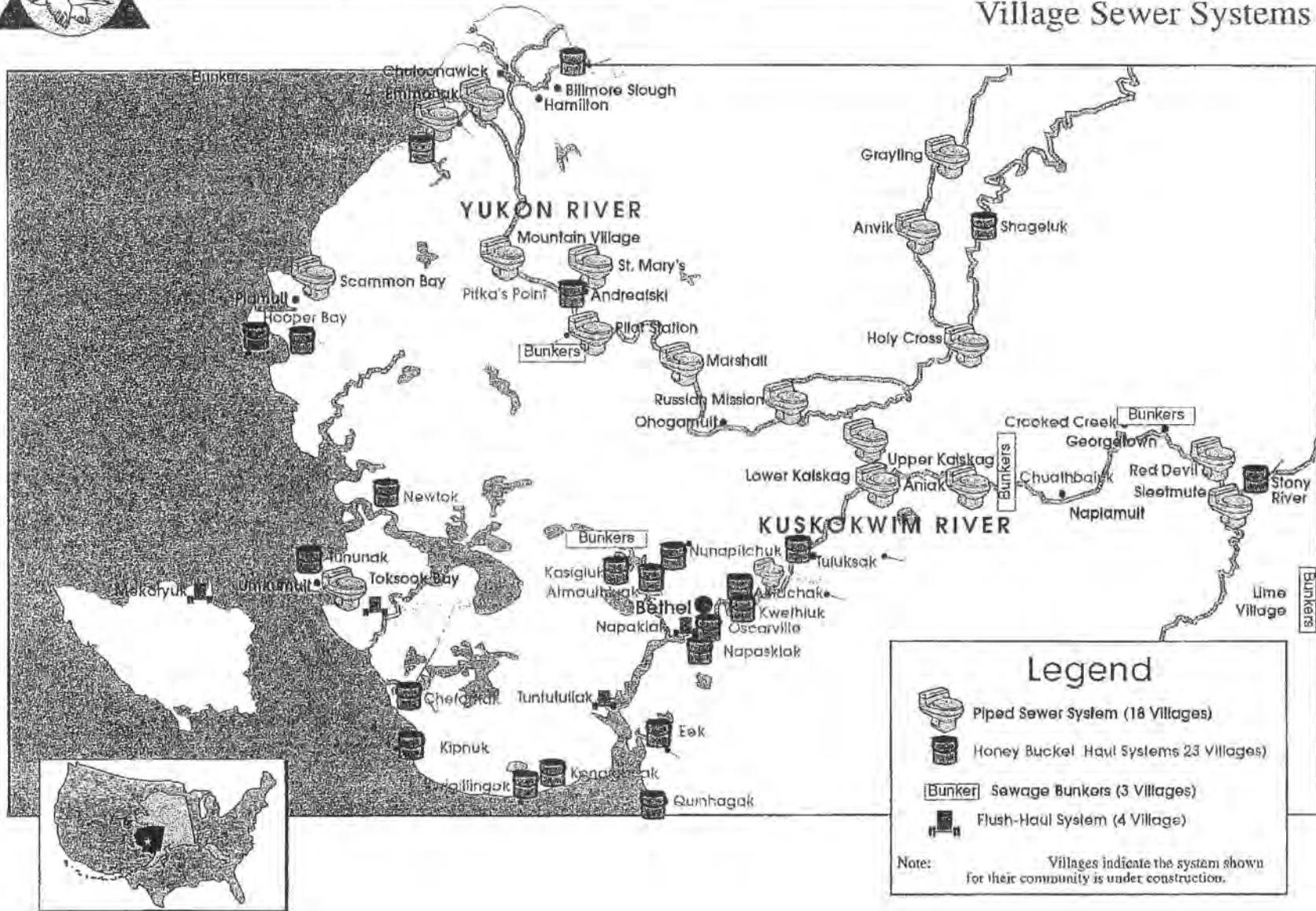


- Kotlik 152 (78)
- Emmonak 146 (75)
- Alakanuk 146 (75)
- Grayling 146 (75)
- Nunam Iqua 152 (78)
- Anvik 134 (69)
- Shageluk 152 (78)
- McGrath
- Mountain Village 111 (57)
- St. Mary's 99 (51)
- Scammon Bay 128 (66)
- Pitka's Point 111 (57)
- Andreafski
- Pilot Station 93 (48)
- Marshall 76 (39)
- Holy Cross 111 (57)
- Hooper Bay 152 (78)
- Chevak 146 (74)
- Russian Mission 70 (36)
- Crooked Creek 134 (69)
- Upper Kalskag
- Lower Kalskag 76 (39)
- Aniak 93 (48)
- Red Devil 157 (81)
- Stony River NA (100)
- Chuathbaluk 99 (51)
- Sleetmute 152 (78)
- Newtok 93 (48)
- Tununak 111 (57)
- Nunapitchuk 29 (15)
- Kasigluk 29 (15)
- Tuluksak 40 (21)
- Mekoryuk 140 (72)
- Toksook Bay 111 (57)
- Atmautluak 29 (15)
- Akiak 29 (15)
- Akiachak 29 (15)
- Nightmute 99 (51)
- Napakiak 23 (12)
- Oscarville
- Kwethluk 29 (15)
- Napaskiak 23 (12)
- Chefornak 93 (48)
- Tuntutuliak 40 (21)
- Lime Village NA (115)
- Kipnuk 93 (48)
- Eek 40 (21)
- Kongiganak 70 (36)
- Kwigillingok 76 (39)
- Quinhagak 70 (36)



YUKON-KUSKOKWIM HEALTH CORPORATION • SERVICE AREA

Village Sewer Systems



3.0 Timelines for Rural Utility Cooperative (RUC) Infrastructure and Development

Figure B-1: RUC Development and the Impact of Events on Rural Alaska Sanitation shows the importance of major political, governmental, regulatory, and other events on rural sanitation in general, and the development and implementation of the RUC concept in particular. The demise of revenue sharing instituted in 1969, along with increasing costs, system complexity, and regulatory requirements affecting drinking water and wastewater treatment have led to the current state regarding the viability of water systems. It is worth noting that 38 percent of village water systems were not in compliance with Alaska Department of Environmental Conservation (ADEC) and federal EPA regulations, resulting in many reported violations on the Significant Non-Compliance (SNC) list. The ability of villages to take and have bacteriological samples analyzed is used as a measure of regulatory compliance later in the key performance indicators section of this report.

Major public laws and regulatory “milestones” or events provide the context for efficient and effective provision of sanitation services in Alaska. **Appendix B: Context for Provision of Sanitation Services in Alaska: A Chronology of Events, Laws, and Milestones**, details the events, laws, and milestones in much greater detail for the engineers, environmental health specialists, policy analysts, public health practitioners, and the interested public. It is important to remember the unique contributions that Alaska’s Natives have made to the State of Alaska as a whole and the cultural context and business practices prevalent in the villages. The smaller villages without piped water and sewer face enormous challenges that are much different than those in the urbanized centers like Anchorage, Mat-Su, Juneau, and Fairbanks. Other essential knowledge in planning for sustainability in rural Alaska involves understanding major laws such as the Alaska National Interest Lands Conservation Act (ANILCA, Public Law 96-487) and the Alaska Native Claims Settlement Act (ANCSA, Public Law 92-203), as well as the Alaska Statehood Act, and the dependence on a subsistence economy rather than governmental and private sector employment throughout rural Alaska. Laws and the above-noted social, economic, and cultural realities govern the setting in which development of a concept like the RUC takes place. In many ways, Alaska’s villages are unlike any communities in the Lower 48 states. The Y-K Delta region shares this uniqueness. In other ways, establishing viable drinking water systems is very similar to the challenges facing any small drinking water system. We also sought to understand how the challenges facing villages in the Y-K region are indicative of those facing all small water supply systems in Alaska, and how the RUC concept might be adopted by others within the State of Alaska, in an evolving statewide concept becoming known as the ARUC—Alaska Rural Utility Cooperative.

4.0 Current, Former and Prospective RUC Villages: Demographic Profile and Perspectives

The following are “RUC communities,” villages where a Memorandum of Agreement signed by YKHC and the village Mayor or chief official exists as of July 2007:

- Chevak
- Grayling
- Holy Cross
- Russian Mission
- Toksook Bay
- Upper Kalskag
- Lower Kalskag
- Goodnews Bay

Appendix C: Current Rural Utility Cooperative Villages and Former and Prospective RUC Members (August 2007) presents demographic information in the Alaska Department of Commerce, Community, and Economic Development (DCCED) community database and management information. Population figures are given for 2007, estimates provided by the state demographer. Several observations can be made from analyzing this data and comparing with 2000 census data in the community profiles:

- Communities in the Y-K Delta Region are growing only at a very slight rate, with the population basically relatively stable.
- Population ethnicity is dominated by Alaska Native or part-Alaska Native classification (it is not unusual for this combined percentage to exceed 95 percent in the villages).

Statistics relevant to utility planning and rate structures and collections include: number of housing units, housing units served by piped water and sewer systems, employment rate, unemployment rate, median household income, and per capita income. **Section 5 of this final evaluation** contains data on the number of connections and the breakdown in the residential, institutional, and commercial categories. Population and utility statistics such as percentage of operable connections, water and sewer billing rate, and the number of connections can be used to monitor progress and evaluate prospects for attainment of the 2006 and 2007 budgets for the current and prospective RUC villages.

Before the YKHC indirect cost of 25 percent was added in the 2006 Consolidated Budget (Appendix D) three of the six then-current RUC villages, Toksook Bay, Upper Kalskag, and Alakanuk, were estimated to be generating a surplus using the assumptions in construction of the budget. One key assumption is that schools use 10 percent of water production at 10 cents per gallon. Note the estimated combined shortfall for all of the 10 villages is approximately \$256,000 using the assumptions in the table.

The former and prospective 2007 RUC Villages selected as relevant to the final evaluation include:

- Alakanuk
- Kwethluk
- Akiak
- Mountain Village

The first two villages were RUC members and gained benefits from their stint in the RUC: there are other villages in the Y-K Delta that may have a strong interest in joining the RUC in the future. The total population of the current RUC communities is 2,995; there are generally fewer than 100 connections per village – mostly residential, with the largest number (177) in Chevak, which has the largest population of the RUC villages. The total number of residential operable connections is 826 (see Table 5-4 for a detailed breakdown).

Data collected for the former and prospective communities is presented in Section 5 as well. The prospective villages identified in the Interim Evaluation that joined the RUC included Chevak, Kwethluk, and Lower Kalskag. Pilot Station was previously considered to be a prospective community.

One of the critical points in this assessment is that these communities face challenges, such as the ability to raise enough revenue to cover operation and maintenance expenses. This is a challenge that most communities face in developing viable utility systems. Rural and remote Alaska are difficult places to provide water and sanitation services. Meeting these challenges and planning for sustainable utility operations is the topic of the next section of this report, which presents data and analysis associated with the key performance indicators development for the final RUC evaluation.

5.0 Key Performance Indicators (KPIs) in the Management of the Viability of Water and Wastewater Treatment Systems

There are numerous factors that are important in evaluating whether a piped water and sewer system is viable in the sense that sustainable operations can be maintained, quality improvements and customer service enhanced, and the public health benefits of these systems can be attained over time. There are literally hundreds of factors that affect the engineered characteristics and economics of a specific public water system. For example, the source of water supply, the type (deep wells, lakes, rivers), quality of water, proximity to the water plant, treatment system, and customer distribution) affect economics as well as the benefits of the public water supply. One way of comparing the performance of the current and prospective RUC villages with non-RUC villages is to apply an overall scoring metric originally proposed in the Martin consulting report (2002) and monitor the scores over time. The rationale for ANTHC's data collection every six months from site visits and telephone surveys is to see if this approach accurately predicts the sustainability of operations.

Our approach in this final evaluation is to evaluate the progress of RUC communities using eight KPIs. The indicators are listed below, along with measure for tracking or monitoring. Of the prospective RUC villages (Alakanuk, Kwethluk, Lower Kalskag, and Pilot Station), two villages are former RUC villages (Alakanuk and Kwethluk). ANTHC may use the KPIs listed below for measurement/monitoring in the near future, to bring prospective RUC villages into the cooperative.

- **Affordability** (measured by use of median household income, percentages of that income, and monthly user fees for the water and sewer charges, including charges expected under the new RUC residential rate structure). Other variables of interest: Capital improvement budgets and renovation by region and by village.
- **Qualified Operators/Operations** (measured by WPO qualifications, availability of insurance for WPOs, hourly wages and total hours worked, and benefits).
- **Water Production** (a per capita measure may help in assessing "efficiency," since system integrity is important). Other variables of interest: source, type, quality, proximity.
- **Population and Operable Connections** (per "sector" analysis includes residential, institutional, and commercial).
- **Collection Percentage: Billed Utilities** (revenue collected monthly compared to amounts billed; 6-mo. average to adjust for month-by-month distortions).
- **Electrical Use and Cost per Kilowatt-hour, Fuel Consumption and Fuel Cost per Gallon** (these can be significant cost items in the annual budget for operations).

- **Community Capacity Development:** Villages need to develop the capacity to operate water and sewer utilities, as well as provide other services.
- **Regulatory Compliance:** (measured by whether the WPO takes biological samples and these are analyzed by a certified laboratory, and whether the village is on the SNC list issued by ADEC). Related variables of interest: Consumer confidence, preventive maintenance, testing methods, record keeping.

These KPI measurements can be used to *compare progress or decline in a specific village for a pre-RUC time period versus the current status as of August 1, 2007, and highlight insights that an overall score masks or fails to communicate.*

5.1 Affordability

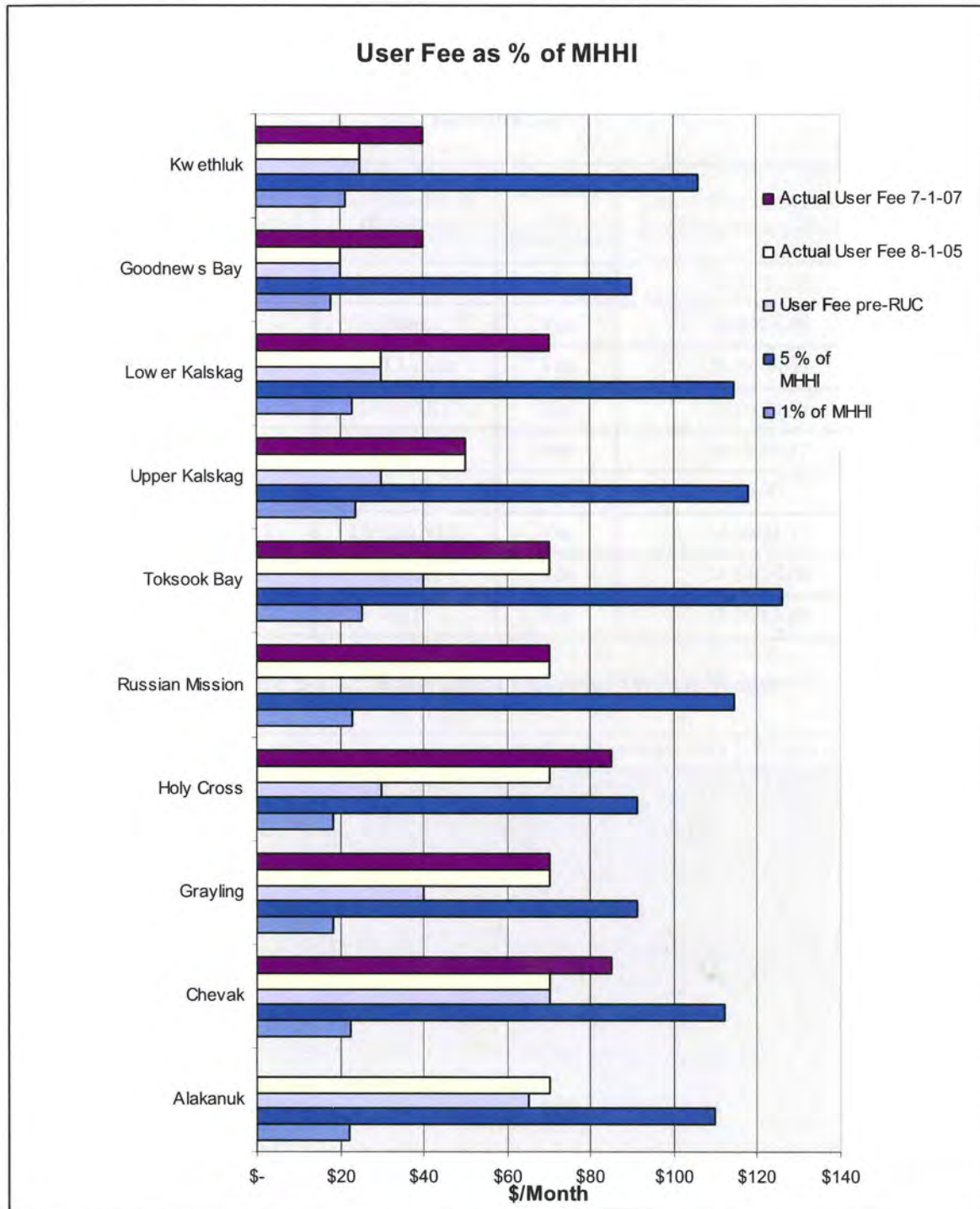
Table 5-1 shows the median household income and affordability indices for RUC villages. Figure 5-1 shows the user fee as a percentage of Median Household Income (MHHI).

Table 5-1 Affordability of Water and Sewer in RUC Villages

Community	MHHI 2000	1 % of MHHI	2 % of MHHI	4.5 % of MHHI	5 % of MHHI	User Fee pre-RUC	Actual User Fee 8-1-05	Actual User Fee 7-1-07
Alakanuk	\$26,346	\$22	\$44	\$99	\$110	\$65	\$70	
Chevak	\$26,875	\$22	\$45	\$101	\$112	\$70	\$70	\$85
Grayling	\$21,875	\$18	\$36	\$82	\$91	\$40	\$70	\$70
HolyCross	\$21,875	\$18	\$36	\$82	\$92	\$30	\$70	\$85
Russian Mission	\$27,500	\$23	\$46	\$103	\$115	\$-	\$70	\$70
Toksook Bay	\$30,208	\$25	\$50	\$113	\$126	\$40	\$70	\$70
Upper Kalskag	\$28,333	\$24	\$47	\$106	\$118	\$30	\$50	\$50
Lower Kalskag	\$27,500	\$23	\$46	\$103	\$115	\$30	\$30	\$70
Goodnews Bay	\$21,563	\$18	\$36	\$81	\$90	\$20	\$20	\$40
Kwethluk	\$25,417	\$21	\$42	\$95	\$106	\$25	\$25	\$40

Note:
MHHI Median Household Income

Figure 5-1 User Fee as Percent of Median Household Income (MHHI)



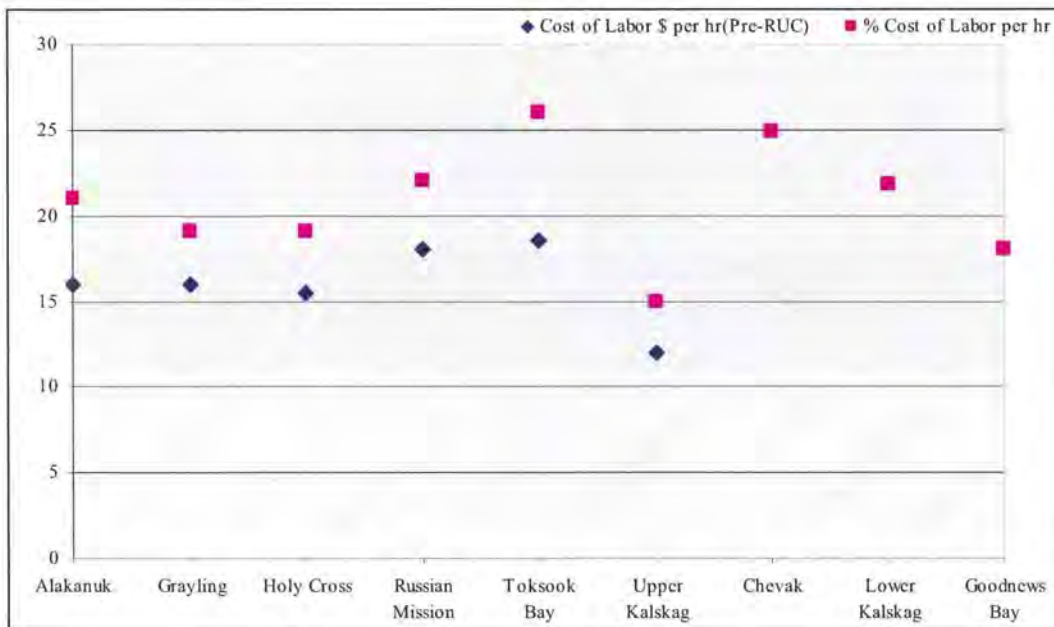
5.2 Qualified Operators/Operations

Table 5-2 and Figure 5-2 present information on water plants and WPOs. Figure 5-2 shows the wages of WPOs, both pre-RUC and current figures for RUC villages.

Table 5-2 Certification Levels of WPOs with Hours Worked, Wages, and Related Information

Location	Plant Certification	Certification of Operators	Insurance for Operators	Labor Cost in \$ per hour Lead Operator / Back up	Hours Worked
Alakanuk	LVL 2	LVL 1/OIT	Yes	20.21/16.00	-
Grayling	T	None	Yes	16.00/16.00	116
Holy Cross	T	LVL1/none	Yes	20.34/16.00	103
Russian Mission	U	LVL1/OIT	Yes	22.66/20.34	160
Toksook Bay	LVL 2	LVL2/OIT	Yes	26.53/19.17	339
Upper Kalskag	N/A	None	Yes	16.00	78
Chevak	LVL 2	LVL2/LVL2	Yes	24.90/24.33	191
Lower Kalskag	T	OIT/OIT	Yes	21.84/16.00	121
Goodnews Bay	LVL 2	OIT	Yes	18.00/16.00	152

Figure 5-2 Water Plant Operator (WPO) Wages

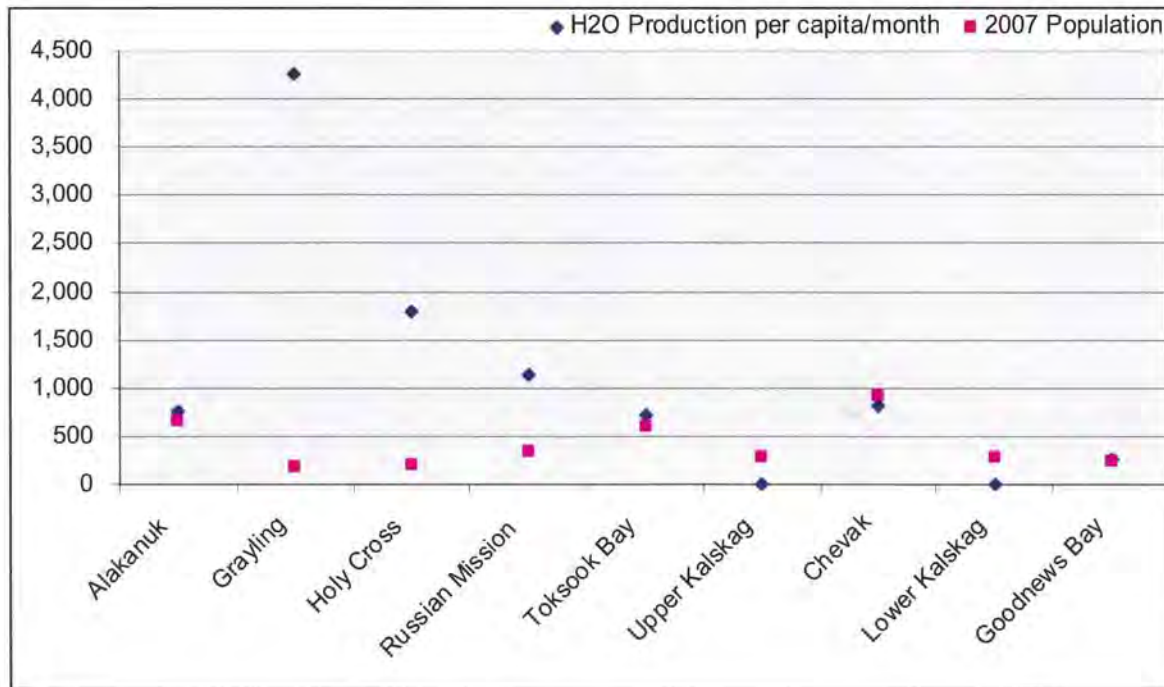


5.3 Water Production

Table 5-3 Per Capita Water Production for RUC Communities, Fuel Cost and Consumption, and Water Supply Type, April 2007

RUC Communities	2007 Population	Monthly H2O production	Monthly Water Production Per Capita	Gallons Per Person Per Day	Type of Water Supply
Alakanuk	663	504,670	761	25	Surface Water
Grayling	174	742,400	4,267	142	Surface Water
Holy Cross	204	364,200	1,785	60	Groundwater
Russian Mission	329	374,401	1,138	38	Groundwater
Toksook Bay	598	426,800	714	24	Groundwater
Upper Kalskag	271	N/A	N/A	-	Individual Wells
Chevak	908	749,784	826	28	Groundwater
Lower Kalskag	269	-	-	-	Groundwater
Goodnews Bay	242	64,490	266	9	Groundwater

Figure 5-3 Water Production



5.4 Population and Operable Connections

Analysis of the number of connections has shown a steady increase of the past 5 years. The number of connections can serve as a proxy for illustrating some of the benefits of a public water supply. More research needs to be done on how having piped drinking water and a sound sanitation system for waste helps to decrease the disease burden of the population in remote villages.

Table 5-4 Total Number of Operable Connections by Year

Year	Total Number of Operable Connections
2003	253
2004	402
2005	592
2006	880
2007	880

Figure 5-4 Total Number of Operable Connections by Year

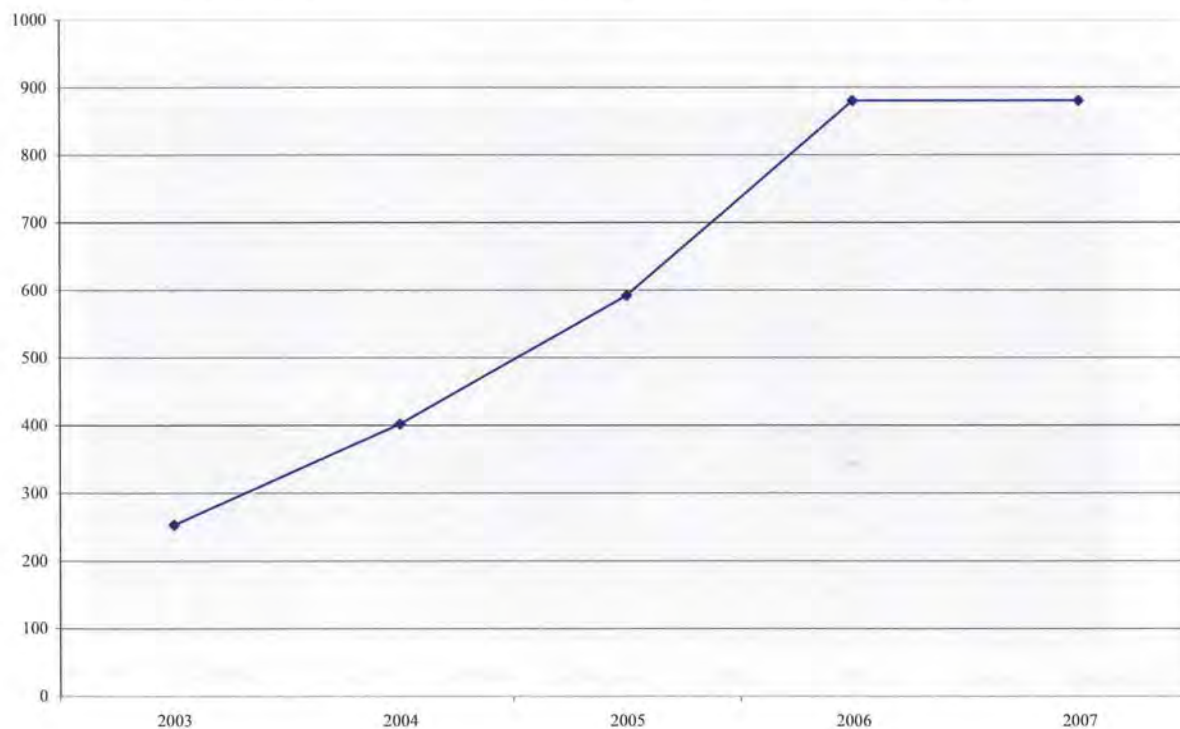
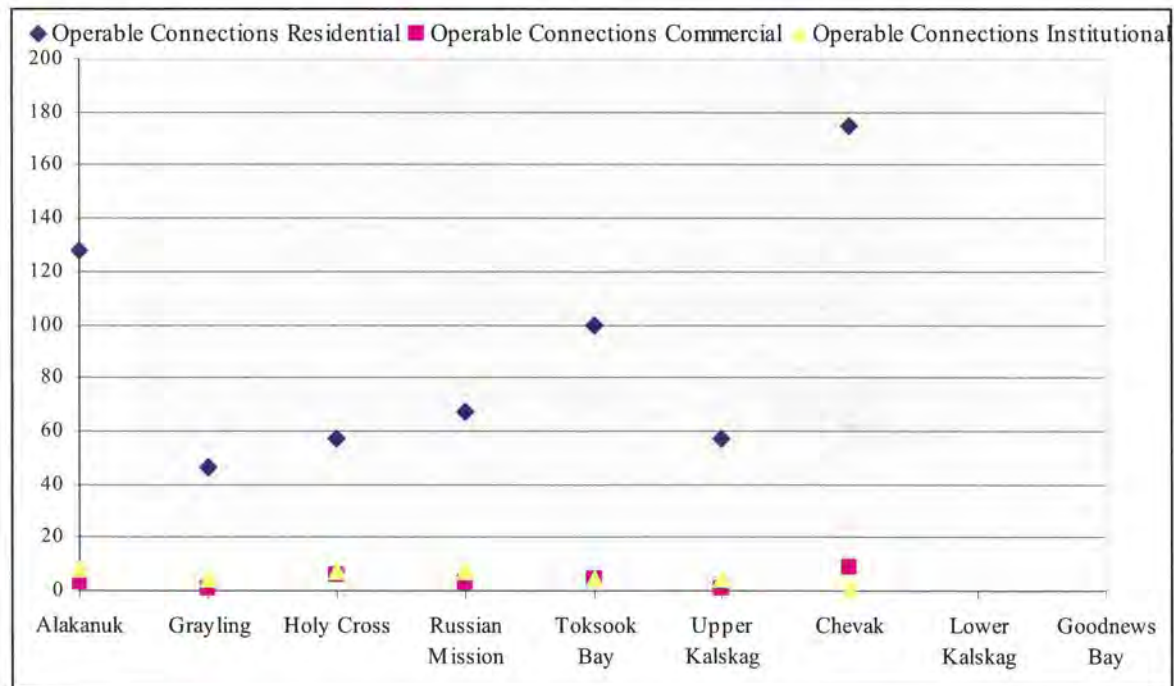


Table 5-5 Population, Water Production and Operable Connections

Location	Pop (2000)	Pop (2004)	Pop (2007)	Water Production (Apr 2007)	Operable Connections (Res'l)	Operable Connections (Institn'l)	Operable Connections (Comm'l)
Alakanuk	652	667	663	504,760	129	7	4
Grayling	194	182	174	742,400	63	4	1
Holy Cross	227	206	204	364,200	81	5	8
Russian Mission	296	331	329	374,401	66	1	4
Toksook Bay	532	561	598	426,800	110	4	4
Upper Kalskag	230	263	271	N/A	60	1	4
Chevak	765	899	908	749,784	177	5	6
Lower Kalskag	267	262	269	-	73	1	4
Goodnews Bay	230	230	242	64,490	67	1	1
Total					826	29	36

Figure 5-5 Operable Connections (Current as of 2007)



5.5 Collection Percentage; Billed Utilities

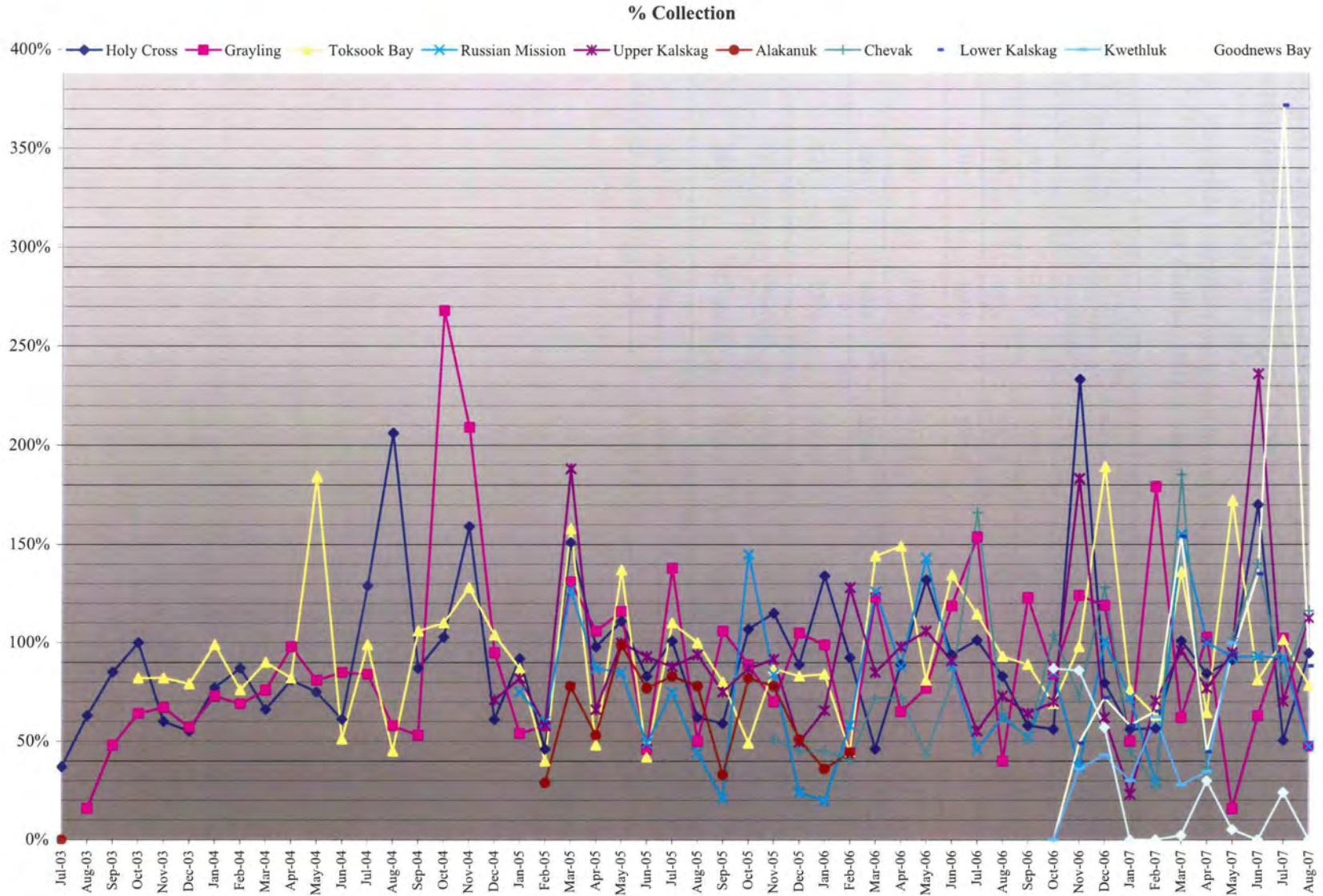
Table 5-6 Collection Rate for RUC Communities

RUC Communities	2000 Census Pop.	2004 Pop.	2007 Pop	Collection Rates (6 mos. Average, Nov - April)				
				4/1/2002	4/1/2004	4/1/2005	4/1/2006	4/1/2007
Alakanuk	652	667	663	~95	87	71	52	N/A
Grayling	194	182	174	~95	84	100	84	93
Holy Cross	227	206	204	~80	110	96	94	100
Russian Mission	296	331	329	N/A	82	75	67	84
Toksook Bay	532	561	598	~85	48	95	99	114
Upper Kalskag	230	263	271	~85	66	93	86	87
Chevak	765	899	908	N/A	N/A	N/A	54	85
Lower Kalskag	267	262	269	N/A	N/A	N/A	N/A	77
Goodnews Bay	230	230	242	N/A	N/A	N/A	N/A	26

Note:

N/A Data not available

Figure 5-6 Collection Percentage



5.6 Electric Use and Cost per Kilowatt-hour; Fuel Consumption and Fuel Cost per Gallon

Table 5-7 Electrical Use and Cost per Kilowatt-hour, Fuel Consumption and Fuel Cost per Gallon, RUC Communities, April 2007

RUC Communities	2007 Pop.	% of Operable Connections	Fuel Cost (Per Gal)	Fuel Consumption (Gal)	Cost per KWh	Electricity Consumption (KWh)
Alakanuk	663	89%	N/A	90	\$0.21	14,362
Grayling	174	75%	\$3.25	350	\$0.28	10,079
Holy Cross	204	89%	\$5.25	541	\$0.20	5,732
Russian Mission	329	100%	\$1.84	193	\$0.25	203
Toksook Bay	598	92%	\$2.84	213	\$0.20	4,476
Upper Kalskag	271	95%	\$3.42	N/A	\$0.22	1,241
Chevak	908	~ 95% (est)	\$2.55	495	\$0.15	23,132
Lower Kalskag	269	~95%(est)	\$3.42	120	\$0.17	7,514
Goodnews Bay	242	~95%(est)	\$3.42	—	\$0.16	4,867

5.7 Community Capacity Development

Rural communities are at different stages of development regarding provision of sustainable water and sewer services. Whereas some communities have watering points, others have clean drinking water piped into houses. Some villages have honey buckets and transfer stations, while others have piped sanitation services.

The RUC concept builds on a continuum; viable water and sewer systems must generate revenue to facilitate operations. The RUC communities benefit from a billing program for water and sewer. They can also access planning and managerial resources of the Statewide Utility Association. The Alaska Utility Supply Center (AUSC) can lower the cost of spare parts and help with inventories. The Remote Maintenance Worker (RMW) Program leverages the capabilities of water plant operators (WPOs).

RUBA collects data on 27 essential indicators; these may be used to assess the likelihood that villages have the managerial, financial, and institutional capabilities to benefit from new capital investment in either or both water and sanitation facilities.

The information presented in this section summarizes the 27 essential indicators and community status over time (three quarterly periods) for the RUC member villages. RUC villages enjoy compliance with these requirements and can access the planning and operational resources described above.

Table 5-8 Rural Utility Business Advisory (RUBA) – 27 Essential Indicators

1	All revenues and expenses for the utility are listed in the utility budget.
2	The utility adopted a balance realistic budget.
3	Monthly Financial Reports are prepared and submitted to the policy making board.
4	The utility is current in paying all water/wastewater electric bills.
5	The utility has on hand a year's adequate fuel supply or it has a financial plan to purchase an adequate supply.
6	The utility is receiving revenues (user fees or other sources) sufficient to cover operating expenses.
7	The utility and expenses for the utility are listed in the utility budget.
8	The utility bills customers on a regular basis.
9	An Accounts Receivable is in place which tracks customers & reports past due accounts and amounts.
10	An Accounts Payable system is in place.
11	The payroll system correctly calculates payroll and keeps records.
12	A cash receipts system is in place that records incoming money and what it was for.
13	The utility has a cash disbursement system that records how money was spent.
14	The utility has a system to accurately calculate, track, and report payroll tax liabilities.
15	The utility is current filing tax reports.
16	The utility is current on making tax deposits.
17	If there are any past due tax liabilities, a repayment agreement has been signed and repayment are current.
18	The utility has a posted workers compensation insurance policy in effect.
19	The utility that owns the utility is known; the entity that will operate the utility is set.
20	The policy making body is active in policy making of the utility.
21	The policy making body enforces utility policy.
22	The utility has an adequately trained manager.
23	The utility has an adequately trained bookkeeper.
24	The utility has an adequately trained operator or operators.
25	The utility has adopted the necessary ordinances necessary to give it the authority to operate.
26	The utility operator(s) are actively working towards necessary certification.
27	Utility has a preventative maintenance plan developed for the existing sanitation facilities.
#1 - #6	Accounting
#7 - #13	Finance
#14 - #17	IRS Problems
#18	Workers Compensation Insurance
#19 - #25	Organizational Management
#26 - #27	Operation of Utility

Table 5-9 (Continued) Legend

LEGEND:

Color Code:

	Former RUC Community
	Current RUC Community
Community	Name of Community
LGS	State of Alaska Local Government Specialist
Pop.	Population of Community
Region	Geographical Region Community is located
THO	Tribal Health Organization
Date	Designated RUBA Quarters RUBA Assessment was given by Local Government Specialist
VSW	Village Safe Water Organization
ANTHC	Alaska Native Tribal Health Consortium (ANTHC) Division of Environment Health Engineers (DEHE)
N1 - N4	Information is either Not Applicable and/or Not Available
P1 - P4	Community has passed Rural Utility Business Advisor (RUBA) Assessment for Designated Quarter
C	Community is run by City Administration
T	Community is run by Tribal Administration
Region	Community recognizes RUBA Agreement signed with the State of Alaska Local Government Specialist
Agrmt	Community has signed RUBA Agreement
Color Code:	
#1 - #6	Accounting
#7 - #11	Finance
#12 - #17	IRS Problems
#18	Workers Compensation Insurance
#19 - #25	Organizational Management
#26 - #27	Operation of Utility

5.8 Regulatory Compliance

The user fee data in Table 5-1 presents median household income for the RUC villages plus Alakanuk and Kwethluk. After the interim evaluation was completed, Chevak was the first of the prospective RUC villages to join the RUC via a memorandum of agreement for water and sanitation services.

All the RUC communities are working on moving off of the SNC list, or are currently in compliance. Non-RUC communities often struggle with ADEC rules regarding surface water treatment, arsenic levels in water, bacteriological and other sampling, remedial measures, and record keeping and reporting.

The Regulatory Commission of Alaska (RCA) certifies villages to perform water and sanitation services via issuance of a public certification of need. All RUC member villages operate under a single certificate, giving the RUC a small but significant economy of scale.

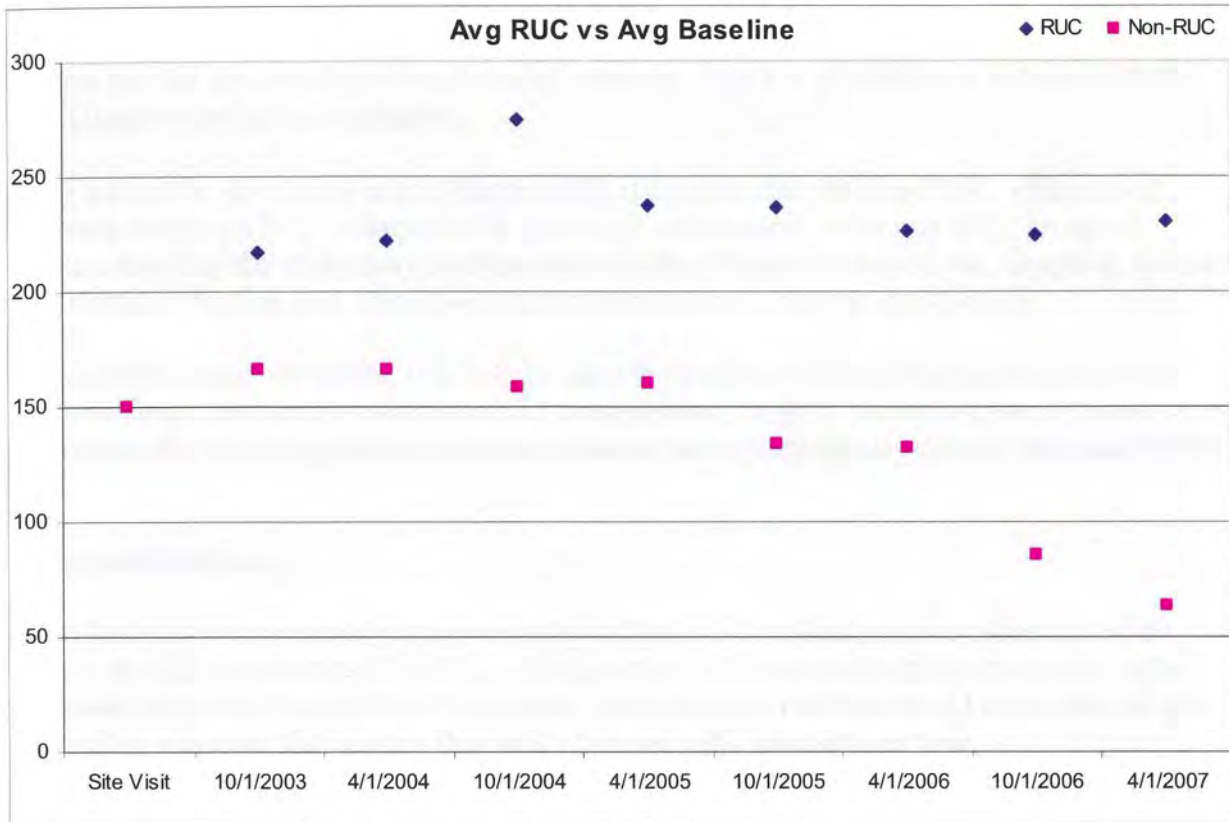
5.9 RUC versus Non-RUC Comparison

Table 5-9 gives scores for RUC and non-RUC villages, which are a composite of 17 indicators originally used in the Martin report (2002). The RUC villages compare very favorably to the non-RUC villages using this metric (also see Figure 5-6).

Table 5-10 Performance Indicators

Community	Site Visit	10/1 2003	4/1 2004	10/1 2004	4/1 2005	10/1 2005	4/1 2006	10/1 2006	4/1 2007	Avg Score
Alakanuk	235	240	240	240	240	190	194	164	90	225.6
Holy Cross	202	239	220	262	269	242	261	261	225	242.1
Grayling	195	169	203	373	229	207	169	169	274	220.7
Mtn Village	232	230	230	230	230	150	140	135	135	206
Toksook Bay	175	244	244	272	200	216	207	202	220	222.6
Kotlik	250	220	220	220	220	170	160	111	101	208.6
Russian Mission	168	220	220	240	267	290	210	210	209	230.7
Upper Kalskag	215	225	225	225	221	226	283	283	226	231.4
Marshall	210	224	224	224	224	149	139	283	88	199.1
Scammon Bay	200	205	205	205	205	205	160	153	143	197.9
Anvik	145	190	190	190	190	100	80	87	57	155
Hooper Bay	121	160	140	140	160	160	150	40	10	147.3
Chefornak	110	140	160	160	140	80	100	90	90	127.1
Quinhagak	70	150	150	150	150	160	170	86	91	142.9
Nunam Iqua	81	110	110	130	130	130	130	10	0	117.3
Tuluksak	80	120	100	120	120	120	120	20	20	111.4
Crooked Creek	73	100	120	100	120	100	100	70	60	101.9
Atmautluak	80	110	110	90	90	100	90	-10	-10	95.71
Akiak	83	90	90	90	90	90	90	-10	0	89
Pitkas Point	80	90	90	90	90	100	160	60	75	100
RUC		217.3	222.3	274.4	237.2	236.2	226.0	225.0	230.8	
Non-RUC	150.25	166.1	166.1	158.6	159.9	133.6	132.2	85.9	63.3	

Figure 5-7 Average RUC versus Average Baseline



6.0 Conclusions and Recommendations

This section summarizes the recommendations from the assessment of RUC versus Non-RUC villages and the final evaluation undertaken using the eight key performance indicators (KPIs). Conclusions wrap up the evaluation.

Using the metric developed in the Martin study, it appears that the listed RUC villages and Alakanuk (a former RUC village) score quite well with respect to the non-RUC group of villages. Ranking the villages by scoring results in the villages of Holy Cross, Grayling, Toksook Bay, Russian Mission, and Upper Kalskag appearing among the top eight scores.

Although the scores are useful, it is believed that the tracking of the KPIs provides more in-depth, accurate, and timely information for consideration by RUC decision makers. Based on this conclusion, the following recommendations follow the organizational structure provided by the KPIs.

Recommendation A-1

Given the increase in monthly rates presented in Table 5-1, collection rates related to billed charges should be monitored. Ideally, collection rates will continue to climb over time, rather than peak at a level close to 80 or 90 percent. Disconnection policies should be developed and enforced in a manner that assures that total revenues will increase over time.

Recommendation A-2

YKHC, in conjunction with other RUC managers should assess the prospects for growth in connections.

The Institute of Social and Economic Research (ISER) has done several studies that relate to the affordability of water, sewer, and electrical utilities in rural Alaska (some as case studies). Our understanding of that work is that when these combined are more than 5 percent, there are likely to be problems with the ability of residents to pay for utilities. Also, our understanding is that the Regulatory Commission of Alaska (RCA) and others have task forces or work groups that have examined this issue, with particular focus on water and sewer utilities, as a percentage of median household income (MHHI). Reports that may be useful to further study of this issue and rate structures are included in the References. A standard of 4.5 or 5 percent for water and sewer combined may be evaluated in the near term. The RUC may adopt a policy towards affordability in line with the RCA, and its experience with the Rural Utility Business Advisor (RUBA) Program and the Remote Maintenance Worker (RMW) Program (funded by the EPA).

Recommendations RUC-1 and RUC-2

It is important to collect data via site visits in particular to assess the value of the Martin metric. Such data has been primarily “point in time” rather than time-series data to date. Also, the

prospective RUC villages should be “baselined” using the Martin metrics as well as the KPIs that will be presented later in this evaluation.

Certainly one of the most important factors in the sustainable operation of a water plant is the ability of the WPO to make sure that the plant is producing safe drinking water. We have combined WPO certification with insurance for operators, the Labor Costs (\$/hr.) pre-RUC and after joining the RUC (August 2005 data), and the total hours worked to make a judgment on this KPI. In addition, during the site visits to the RUC villages of Alakanuk, Grayling, and Holy Cross the WPOs were asked whether improved wages, receiving paychecks in a timely fashion, and availability of more benefits from the RUC provided incentive to improve plant operations. The WPOs all answered these questions in the affirmative. In some villages, the lack of budgeted resources and the intermittent paychecks may have led to greater turnover in the job of WPO in the village. We do know that operators in some villages have taken full-time work in higher paying positions. One problem in villages in the paucity of full-time governmental jobs, especially in villages heavily dependent on subsistence.

Table 5-2 shows several interesting points with regard to qualification of WPOs / quality operations. First, the hourly wages are higher for Level 1 operators (as expected). Second, all the RUC villages appear to have sufficient insurance, and there are at least two operators that have been hired in each RUC village. The total hours worked for Alakanuk in 2005 were much higher than for other villages; this is attributable to the fact that Alakanuk has a water haul system that is labor intensive.

In sum, the RUC villages appear to have WPOs who are very qualified to run the water plants. Interviews with WPOs on the site visits to Alakanuk, Grayling, and Holy Cross lend additional credence to this “on paper” evaluation. In some cases, particularly Grayling, it appears that the trend in WPO competence and desire to achieve certifications is definitely better than has been the case in the past, especially in the pre-RUC period, although there was recently a setback attributable to a WPO health problem. The new WPO is not yet certified.

Recommendation WPO-1 and WPO-2

A human resources-driven assessment of the level of competence of WPOs, including their ability to manage staff and to attain higher levels of WPO certification, may be completed by YKHC’s RUC manager. Labor turnover rates in these positions should be closely monitored.

Figure 5-2 – WPO Wages shows the cost of labor per hour, both pre-RUC and currently. This is a comparison of labor costs per hour in the RUC in August 2007 compared to pre-RUC labor cost per hour in each village.

Recommendation WPPC-1

Water production figures are very useful for estimating public health benefits of clean water and for “troubleshooting” inefficiencies (when consumption patterns increase dramatically, it may be a system leak or malfunction rather than increase water consumption). Managers should assess water production quarterly.

Table 5-3: Water Production tends to mask several realities of providing utilities in the Y-K Delta region: population is relatively static; there is a very small institutional and commercial sector (combined) so that the systems are primarily residential in nature; and that increasing the number of operable connections may be one of the most cost-effective strategies for increasing revenue to the RUC in the short-term time horizon.

Recommendation POC-1

Managers should evaluate the percentage of operable connections for each RUC village, seeing whether or not it may be possible to increase the number of connections to raise additional revenue.

Recommendation POC-2

The RUC Manager may evaluate whether additional metering might provide information relevant to setting rate schedules, and increasing revenue. Chevak’s monitoring of the water consumption at its Laundromat and the school and faculty residences are good examples of areas in which metering data can facilitate decision making.

Comparing from two quarters can be misleading. Averaging data over annual periods may show much clearer and justifiable trends.

Grayling and Toksook Bay have shown the most volatility in collection rates. The collection percentage is the amount of revenue received relative to the total amount billed. A similar statistic could be calculated using the total number of customers billed and the total number paying some or all or more than 100 percent of their utility bill.

Recommendation COL%-1

It is apparent from the preceding analysis that 100% collection rates are a fiction. Collection rates have improved significantly under RUC management. However, it is important that collection percentage be monitored on a monthly basis, to see if there is a significant decrease in revenue for utility operations given new monthly rates.

The bulk fuel program is able to save money on fuel purchases by purchasing the fuel at one time in large quantities. Costs can increase significantly due to the need to order supplemental supplies and the difficulty of getting deliveries once the Y-K Delta rivers have frozen, thereby making barge deliveries impractical. Electrical costs per KWh are likewise expensive due to the remote location of the villages. Cost per gallon for fuel oil use bulk purchases varied from \$1.83

- \$1.96 per gallon for delivery in the 2004/05 year. In general, oil and electricity costs for the villages is forecasted to be much higher over the next 12 months than the historical average. This will make the bulk fuel purchase program a possible “cost-saving” mechanism for the RUC compared to villages buying the fuel (and potentially adding a markup before using the fuel in the provision of utilities). However, Holy Cross appears to require additional fuel storage capacity in order to take advantage of the RUC bulk fuel purchases.

Recommendation EF-1:

Although the RUC has an inherent advantage over individual villages in purchasing fuel oil in bulk and managing electrical consumption, it is likely that this cost of providing utilities will increase significantly in the near term. Recovery of these costs is essential to achieve or maintain sustainable operations.

The RUC office in the Y-K Delta region and the Statewide Utility Manager may be able to assist the villages in implementing better planning for their annual requirements and implementing purchasing options. In the case of Holy Cross, where the village ordered too little fuel for the winter season, airplane delivery resulted in costs rising by a factor of three for those supplies. The RUC was able to provide them with fuel that it had in reserve. This type of situation and possible negative effects on villages can be avoided through coordinated planning and purchasing, with the RUC helping with planning and possibly having reserves that would serve the village on an emergency or contingency basis.

Currently all of the RUC villages are in moderately good shape with respect to regulatory compliance. That said, at one point Grayling was on the SNC list for lack of compliance with the surface water treatment rule.

In general, compliance with regulations has tended to get more complex with time. Also, the costs of not being proactive are greater, as is the potential downside of losing customer confidence in the quality of village water. Grayling had violations listed from January 2004 through May 2005. Typically it takes six months of compliance to get off the SNC list.

We have chosen to address regulatory compliance by determining whether or not the village is able to take bacteriological samples to test for fecal coliform on a regular basis. These samples must be sent in a timely fashion to a certified laboratory, which can be a problem given the nature of transportation and shipping in the Y-K Delta region.

Using this criterion, however, no RUC villages are on the Significant Non-Compliance list at this time.

Recommendation RC-1

The RUC response to regulatory compliance has, in general, been to respond to situations where the WPO has not completed all requirements or a problem has been identified. The State of Alaska, Department of Environmental Conservation (ADEC), Division of Environmental Health manages the Drinking Water Program (DWP). YKHC may establish capabilities to deal

proactively with potential regulatory compliance issues, especially with regard to bacteriological sampling, the implementation of the surface water treatment rule, radiological testing, and record keeping, especially with regard to chlorine levels and turbidity. In addition to the RUC staff, YKHC employs environmental health officers (EHOs) who are responsible for working with villages and conducting community water surveys as well as community sanitation surveys.

Implementation of the recommendations in this Final RUC Evaluation Report will allow the RUC to improve efficiency, addressing dynamic factors such as escalation in fuel costs, and become more proactive in areas such as meeting regulatory compliance issues and identifying management challenges such as maintaining or enhancing collection rates. Ultimately the RUC has great potential to implement innovative management practices across all of the "expanding" (current, and former and prospective) RUC villages, which would prove unwieldy if the challenges were addressed on a village-by-village basis.

In conclusion, the RUC management concept has many inherent advantages and has the promise to bring the public health benefits of a clean water supply to villages remotely located throughout the Y-K Delta region.

7.0 References

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Alaska Community Database Community Information

“RUC Communities”

- Alakanuk
- Grayling
- Holy Cross
- Russian Mission
- Toksook Bay
- Upper Kalskag

“Prospective RUC Communities”

- Chevak
- Kwethluk
- Lower Kalskag
- Pilot Station

Appendices

- A Denali Commission Funding Contribution Proposal: Regional Utility Cooperative – Proposed Demonstration Project
- B Context for Provision of Sanitation Services in Alaska: A Chronology of Events, Laws, and Milestones
Figure B-1 – RUC Development and the Impact of Events on Rural Alaska Sanitation
- C Current Rural Utility Cooperative Villages and Former and Prospective RUC Members (August 2007)
- D 2006 Consolidated Village Budget (YKHC)
- E 2007 RUC Community Annual Budgets
- F Key Stakeholders

Appendix A

Denali Commission Funding Contribution Proposal:

Regional Utility Cooperative Proposed Demonstration Project

Appendix A

Denali Commission Funding Contribution Proposal:

Regional Utility Cooperative Proposed Demonstration Project



ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

Department of Environmental Health & Engineering

3925 Tudor Centre Drive

Anchorage, Alaska 99508-5997

Telephone: (907) 729-3600

Facsimile: (907) 271-4734

Rural Utility Cooperative Pilot Project Briefing Summary Denali Commission Infrastructure Sub-committee Meeting February 28, 2001

Issue: Many rural communities lack technical/economic capacity to successfully operate utilities.

- Limit cash economy
- High system operator turn over
- Low water quality compliance
- Higher rates of system loss/major repair
- Lack of reliable infrastructure limits potential for economic growth

Current Locally Operated Utility Statistics:

- 63% of local utilities have a less than \$20,000 revenue shortfall to balance expenses
- 42% of communities do not enforce a collection policy
- Approximately 25% of customers are delinquent

Goal: Self-sustaining rural utility organizations

Proposal: Create a regional utility cooperative by bundling multiple local utilities with a successful parent organization to minimize administrative overhead, reduce unit operating costs and improve continuity of service

- RUC provides a potential solution without requiring a subsidy
- RUC maintains local ownership & employment
- RUC provides platform for local input
- RUBA overview predicts economic success
- Challenge will be establishing local relationships/trust

Funding: Parallel applications in process with the Commission and the US EPA
EPA: \$450,000 Commission: \$700,000 → Total \$1,150,000

EPA has verbally committed to a \$100,000 FY2001 contribution with follow-on contributions of \$100,000 to \$175,000 for FY 2002 and 2003.

The ANTHC Board of Directors has committed \$150,000 for first year RUC start-up funding

The Rural Community Assistance Corporation is processing a grant application to fund a FTE to support the RUC

Denali Commission Funding Contribution Proposal

**Regional Utility Cooperative - Proposed Pilot Project
 November 15, 2000**

The Alaska Native Tribal Health Consortium (ANTHC) seeks matching Denali Commission and Environmental Protection Agency (EPA) funding to establish a regional water and sewer utility Cooperative (RUC) pilot project in rural Alaska. While the two base utilities are water and sewer, we expect applicant organizations to include other regionally appropriate utilities in their respective proposals, such as bulk fuel, solid waste, cable TV, or electricity. The central concept is to bundle multiple utilities with a successful parent organization to minimize start up time, reduce unit operating costs and improve continuity of service. Initially an existing parent organization within the State of Alaska, such as a Regional Health Corporation, Borough, or regional utility, would be competitively chosen to carry out this pilot project. Parallel applications to fund the RUC are in process through EPA and the Commission. Demonstration project outcomes would include a functional regional utility, a project final report, and a guidebook that can be used by other communities to establish regional utility cooperatives.

In the publication, *Electric Co-op Today* (September 15, 2000), an article states, “Increasingly, co-ops are managing, even owning, wastewater systems to help develop local economics... Co-ops are stepping forward because nobody else is...and because they have the management skills and the reputation to protect the interests of its citizens and the environment.”

The ANTHC as well as other groups, such as the Rural Community Assistance Corporation, National Rural Water Association, and the Rural Utility Business Advisor Program are prepared to provide funding contributions and/or in-kind services to support the development and implementation of this proposal. For example, In Year 1 ANTHC will contribute \$150,000 to establish the existing community practice baseline and third party evaluation process.

Description	Year 1 - Development		Year 2 - Start Up		Year 3 – Operations		Year 4 - Operations	
	EPA	Denali Co.	EPA	Denali Co.	EPA	Denali Co.	EPA	Denali Co.
Utility Organization	\$100,000	\$150,000	\$0	\$200,000	\$0	\$0	\$0	\$0
Bench Stock	\$0	\$0	\$0	\$100,000	\$25,000	\$25,000	\$0	\$0
Operations Revenue Gap	\$0	\$0	\$175,000	\$125,000	\$150,000	\$0	\$0	\$0
Third Party Evaluation	\$0	\$0	\$0	\$25,000	\$0	\$25,000	\$0	\$50,000
Totals =	\$100,000	\$150,000	\$175,000	\$450,000	\$175,000	\$50,000	\$0	\$50,000
Total EPA Funding =	\$450,000							
Total Denali Co. Funding =	\$700,000							

Executive Summary:

Small community water and sewer utilities in rural Alaska often lack the capacity to properly operate and maintain their systems. This paper outlines a model sanitation utility that will improve capacity through regionalization. A regional utility organization could provide the following 10 benefits:

1. Expand the available customer base.
2. Reduce Operation and Maintenance (O& M) unit costs through bulk ordering.
3. Consolidate tasks (such as billing/collections).
4. Locate the O&M organization in a hub community for easier village access and improved hiring/retention of technical staff.
5. Provide umbrella operator certification.
6. Expand the pool of qualified applicants for positions requiring technical expertise such as a business advisor, technical advisor, and manager.
7. Keep the primary plant operator a local village hire, raising user fee collection rates by keeping the “bill collector” from being a close relative/neighbor.
8. Increase system operating life thereby reducing long-term capitol funding needs and protecting the ‘billion dollar investment’.
9. Improved compliance with the Safe Drinking Water Act.
10. A central point of contact concerning the operation of the water and sewer utility.

The model regional sanitation utility would ‘piggyback’ on an established regional parent organization that is currently providing a related service to the communities. A possible parent organization could be a regional health corporation (the typical Remote Maintenance Worker [RMW] program manager), local governmental unit (such as a borough), or an existing utility like the Alaska Village Electric Cooperative (AVEC). Through economies of scale for management/administration and bulk purchases of fuel and supplies, revised utility rates, improved collections, and the initiation of a water system connection fee policy (or permit fee initiation), a self-sustaining regional utility can be achieved. As part of the demonstration project, the pilot regional utility may consider diversifying and offering other services such as bulk fuel sales or a television cable service.

When establishing the utility organization, a technical advisor would be employed by the utility to provide operational oversight to ensure proper maintenance and upkeep of equipment and timely monitoring and reporting for Safe Drinking Water Act compliance. A business advisor would prepare a business plan and see that financial reports are completed in a timely manner. An advisory group would oversee the formation of the regional utility and assist the utility throughout the duration of the demonstration project.

This model utility would be funded as a demonstration project and could be used as a template for future regional utility organizations throughout the State of Alaska. The model utility would receive initial funding to cover set-up and start-up costs but would be self-sufficient within four

years with no recurring subsidy. The estimated cost of the demonstration project varies between \$0.9 million and \$1.4 million, depending on the number of member villages (10 to 15).

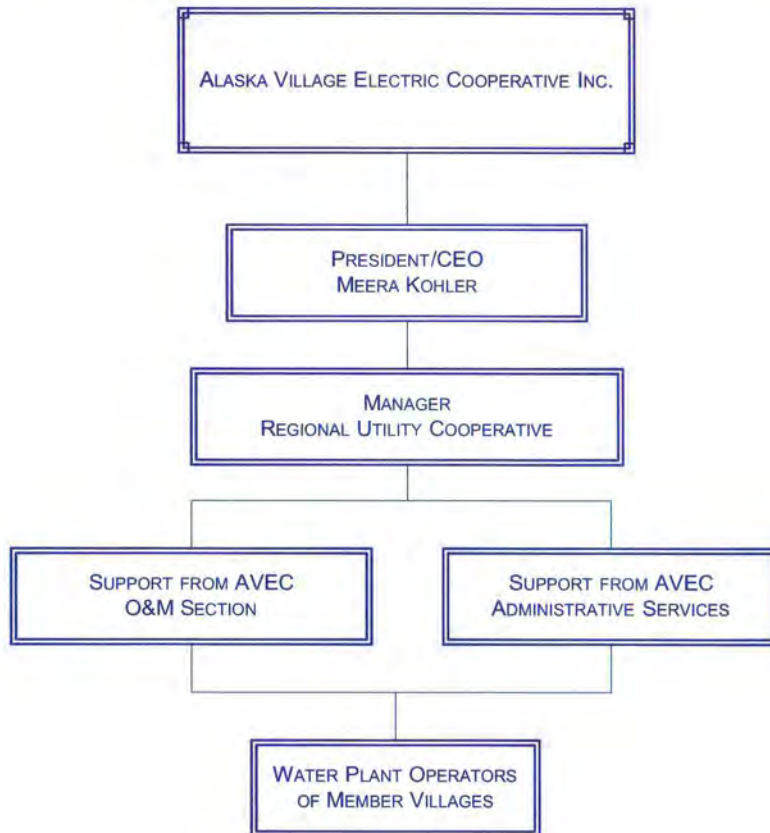
A survey, titled 1999 RUBA Utility Management Survey – Summary of Regional Results, was recently published by the State of Alaska, Rural Utility Business Advisor program. The survey provides data on the managerial and financial capacity of communities in Alaska with a population less than 1,000 (168 communities responded to the survey). The data shows, “twenty-seven percent of the communities reported they did not have a current year budget.” Also, “sixty-four percent of the communities that charge user fees reported they do not collect enough revenue to cover water and sewer costs”. The survey showed only “37% of the utilities that charge for services have service agreements with their customers”. In a paper titled, Operations and Maintenance Issues in Rural Alaska Sanitation, Steve Colt wrote, “proper O&M is crucial to success but severely lacking in many communities today (Colt, 1994)”.

The proposed regional utility organization is consistent with recommendation #7 under “next steps” in the Federal Field Work Group to Congress on Alaska Rural Sanitation, August 1995. The 1995 report recommended instituting a pilot project to develop and evaluate a regionalized water and sewer utility in rural Alaska that can improve the management and operation of water systems. Many other reports, papers, and studies have been completed dealing with the topic of improving O&M of water and sewer systems in rural Alaska. This model regional utility takes the ‘next step’ that has so often been suggested.

1 Assuming 15 member villages

2 Includes a financial audit for 20 villages

REGIONAL UTILITY ORGANIZATION
(EXAMPLE MODEL - NOVEMBER 7, 2000)



Suggested Duties and Responsibilities for the Regional Utility Management Positions

The Regional Utility Manager would initially supervise the technical and business advisors. The manager would be heavily involved in the business aspects of the utility and in establishing a working relationship with member villages. After two years, the manager would be expected to assume the duties of the business manager. The clerical assistant would support all three management positions in the organization with typing, billing, bookkeeping, and other general office assistance.

Suggested duties for the Technical and Business Advisors are listed as follows:

Technical Advisor

1. Provides umbrella operator certification.
2. Provide on-site training in proper sampling, etc.
3. Be involved in general preventative maintenance scheduling.
4. Technical supervision of the local operators.
5. Emergency response coordination.
6. System monitoring.
7. User disconnects.
8. Work orders.
9. Inventory determination.
10. Bulk ordering of fuel and other supplies.
11. Coordinating with other agencies such as making a bulk fuel purchase with AVEC.

Business Advisor

1. Utility business plan.
2. Financial audit for 20 villages.
3. Ordinance audit of selected villages.
4. User fee audit.
5. Monitoring summary status (review of Consumer Confidence Reports).
6. Inventory audit.
7. Assessment of facilities.
8. Audit of the condition and availability of heavy equipment in the member villages.
9. Ordinance development.
10. Fee structure.
11. Budget.
12. Financial issues.
13. Service agreements.
14. Personnel agreements.

Key Financial Points From the 1999 RUBA Survey

1. 27% of the utilities do not have a current budget.
2. 21% of the communities do not charge for services.
3. Average household water and sewer rate is around \$50.
4. 64% of utilities that charge for water and sewer do not collect enough revenue to cover costs.
5. 63% of the utilities that do not collect enough revenue need less than \$20,000 per year to cover costs.
6. 42% of utilities do not enforce a collection policy.
7. Around 25% of the customers are delinquent.
8. 67% of the communities do not save money for equipment fund.

Regional Utility Cooperative Anticipated Schedule

a. First Year - Development

- Establish the ANTHC as pilot manager.
- Select a RUC parent organization.
- Identify approximately 20 potential member villages, and gather initial information about current village operations – publish baseline report.
- Develop RUC business plan, organization, policies, and practice and model agreements.

b. Second Year – RUC Start-up

- Sign up 10 –12 member villages to form RUC; implement business plan (pilot group).
- Remaining communities tracked intermittently as a control group
- Spare parts and other supplies purchased to establish central RUC bench stock.
- Funding subsidy available to cover the projected gap in revenue as the new RUC begins operation.

c. Third Year – RUC continuing subsidized operation

- As the new RUC enters the second year, the operations gap is expected to be half of the previous year.
- Funding will cover a \$150,000 revenue gap for management of the utility and allow for the purchase of an additional \$50,000 of supplies and spare parts.

d. Fourth Year – RUC self-sustained operation

- Funding will be limited to a final \$50,000 payment to cover the third party evaluation and final report of the demonstration project.
- Report to include an analysis of relative successes of the pilot and control groups.
- A guidebook will be published so that other interested utilities can use this project as a model for regional utility cooperatives in other parts of rural Alaska.

**Mr. Robert Beans
P.O. Box 32007
Mountain Village, Alaska 99632**

August 4, 2000

Mr. Steve Weaver,
Alaska Native Tribal Health Consortium
3925 Tudor Centre Drive
Anchorage, AK 99508

Dear Mr. Weaver:

As part of its "2005 Action Plan", the Governor's Council on Rural Sanitation recommended that local governments in rural Alaska consider partnerships as a means of lowering their utility costs and improving the operation and maintenance of sanitation facilities. As stated in the Action Plan, economies of scale equate to power in numbers. Due in part to the small population base in most rural communities, the cost per household to operate and maintain sanitation facilities is much higher than in urban areas where these costs are spread over a greater number of households. By partnering with other communities and forming a regional utility group or cooperative, rural residents may be able to begin to tip economies of scale in their favor. Utility costs could be lowered, and a marked improvement in utility operation and management could be realized.

The regional utility proposal that you have developed will provide an excellent opportunity to put the Council's recommendation into action. I commend the Alaska Native Health Consortium for taking the initiative on this issue. The Governor's Council on Rural Sanitation fully supports your efforts to implement the regional utility proposal as a potential means of improving the operation and maintenance of rural Alaska sanitation utilities. Please keep us apprised of your progress with this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert J. Beans". The signature is fluid and cursive, with a large initial "R" and "B".

Robert Beans
Co-Chair

Appendix B

Context for Provision of Sanitation Services in Alaska:

A Chronology of Events, Laws, and Milestones

APPENDIX B

Context for Provisions of Sanitation Services in Alaska A Chronology of Events, Laws, and Milestones

- 1741- Vitus Bering sails to Alaska. Traders from the Russian-American Company, as well as Russian orthodox missionaries almost immediately begin establishing permanent settlements within Alaska Native territories. Many of these settlements became today's Alaska Native village. Requirements for long-term community viability were not typically considered when selecting settlement locations.
- 1867- Russia sells Alaska to the United States. Within purchase treaty contained the statement, "The uncivilized tribes will be subject to such laws and regulations as the United States may, from time to time, adopt in regard to aboriginal tribes in that country. (1)"
- 1954 - Public Law 86-121 SEC. 7. (a) In carrying out his functions under this Act with respect to the provision of sanitation facilities and services, the Surgeon General is authorized—
- "(1) to construct, improve, extend, or otherwise provide and maintain, by contract or otherwise, essential sanitation facilities, including domestic and community water supplies and facilities, drainage facilities, and sewage- and water-disposal facilities, together with necessary appurtenances and fixtures, for Indian homes, communities, and lands;
- 1958- Through the Alaska Statehood Act, the US Congress addressed the issue of Alaska Native rights for the first time. This legislation acknowledged the right of Alaska Natives to lands in which they used and occupied, as well as, authorized the new state government to select 103 million acres for public domain.
- 1960 – IHS starts providing funding for sanitation projects in Alaska.
- 1969 - Revenue sharing was created in 1969 when the state needed to create governance in rural Alaska. The young state government needed to have some viable entity to talk and deal with in rural communities, and municipal government seemed the obvious answer.
- 1970 – The State of Alaska starts to provide funding for sanitation projects in Alaska.
- 1971 - Through the Land Claims Settlement Act, Alaska Natives traded claims to almost all of Alaska in return for approximately 1/9 of the state's land plus \$962.5 million. With the President's signature on the settlement act, the relationship between the Natives and the land was completely transformed. No longer was ownership directly linked to Native government. Instead, by conveying land title to the 12 regional corporations and 200 local village ones chartered under the laws of the state of Alaska, all ties to traditional or IRA "tribal" governments were bypassed. With the President's signature, Native Alaskans whose earlier use and occupancy had made them co-owners of shared land, now became shareholders in corporate-owned land (1).

- 1974 – Safe Drinking Water Act (SDWA) Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.
- 1975- The Indian Self-Determination and Education Assistance Act gives Alaska Natives the authority to assume ownership of their healthcare programs.
- 1980 - Spanning 3 administrations and 5 sessions of Congress, what had been called the "Alaska lands bill" was enacted into law on December 2, 1980 as the **Alaska National Interest Lands Conservation Act (ANILCA)** P.L. 96-487. Congress and the administration spent nearly 9 years, from 1971-1980, developing this legislation. As the agency most heavily involved with administering Federal lands, the Department of the Interior was given the responsibility to propose and to implement most of the legislation which would affect the present and, ultimately, determine the future of Alaska. However, a number of different Federal agencies, as well as the State of Alaska, Alaska Native groups, and other interested organizations and individuals were involved in the overall process by which legislative proposals were shaped into law through hearings in the Houses of Congress, and other forms of public participation.
- 1982 – The State of Alaska receives funds to start a Remote Maintenance Worker (RMW) program to assist rural communities with the maintenance of their water and sewer systems.
- 1982- State and federal pass through funds supply provide most operational revenue for village utilities. This program, known as municipal revenue sharing, provides adequate revenue for most communities to conduct basic operations without collecting user fees.
- Alaska Permanent Funds pays out its first dividend.
- 1987- Operational revenue from the State’s revenue sharing program begins to decline. Revenues will decrease more than 80% by 2000, before the program is discontinued all together in 2003.
- 1989 – The Surface Water Treatment Rule (SWTR) is enacted by Congress.
- 1992- The Local Utility Matching Program is initiated in the Kotzebue region. The program offered \$40,000 operational subsidies for communities who met a list of capacity indicators. While funding for the program was discontinued in 1994, program managers reported the following results: increased collections by 20%, reduced operator turnover by 74 percent and, improved water testing compliance from 64% to 100%. It was concluded that, “LUMP can dramatically improve short- and long-term operations and maintenance for water systems in villages with subsistence economies.”
- 1992- Section 302 of the Indian Health Amendments authorizes IHS to provide villages with up to 80% of operation and maintenance costs.

- 1994 – The Rural Utility Business Advisor program is funded. RUBA staff provides assistance to small rural communities statewide that are preparing to receive new or upgraded sanitation systems.
- 1996 - Significant revisions to the SWTR were ordered in August, when the Safe Drinking Water Act was reauthorized by Congress.
- 1997 – Senator Stevens becomes the Chairman of the Senate Appropriations Committee (except for an 18 month period when he was the Ranking Member).
- 1999- The Rural Utility Business Advisors (RUBA) program attempts to survey approximately 190 small villages. Major findings were: 21% of surveyed utilities do not charge customers for services; 53% of surveyed utilities that charge for fees do not review or adjust fees to reflect costs; 42% of those communities that charge customers do not attempt to collect past due accounts; 57% of respondents never cut off services to customers with past due accounts.
- 2000- The US Environmental Protection Agency (EPA) adopts the first of a series of new or more stringent drinking water regulations to include the Long Term 1 Enhanced Surface Water Treatment Rule, Stage 2 Microbial and Disinfection Byproducts Rules, Arsenic Rule, Groundwater Rule (proposed), Consumer Confidence Reports Rule, and Radionuclides Rule. Attaining compliance with these new regulations will prove to greatly increase cost and complexity for systems already struggling to provide basic services.

After reviewing sanitation facility financing in rural Alaska, researchers from the University of Alaska noted, “Evidence in this report suggests that even with higher fees, effective collections and good management, some small rural utilities will not be self-supporting (2).” The authors suggest operational subsidies as a potential solution.

ANTHC submits proposal to EPA and the Denali Commission to provide matching funds to develop the Rural Utility Cooperative Demonstration Project.

2001 – ANTHC receives funds for 4 year demonstration project

ANTHC starts the Alaska Utility Supply Center (AUSC) provides discount parts for Native Utilities.

ANTHC selects the Yukon Kuskokwim Health Corporation (YKHC) as its partner in the Demonstration Project, YKHC hires 1st RUC manager.

YKHC hires 2nd RUC manager

The governor vetoed revenue sharing in the budget in 2002 for fiscal year 2003; he did so with little exploration of the impact on rural municipalities and their infrastructure.

2002 – ANTHC hires Statewide Association manager to over see AUSC, RUC, and capacity development for water and sewer utilities.

ANTHC/YKHC completes the Martin Study. A baseline of 20 communities in the YK delta that are interested in joining the RUC.

2003 – Holy Cross is the first community to switch over to RUC operations, 7-1-03.

Grayling becomes the second community, 8-1-03.

Toksook Bay becomes the third member of the RUC, 10-1-03.

2003- Researchers from the University of Alaska's Institute of Social and Economic Research (ISER) suggest that when that when water and sewer costs rise above 2 percent of household income, ability to pay is compromised (3).

2003- Municipal revenue sharing is discontinued.

2004 - Special one-time federal funds in fiscal year 2004 had to be used to stopgap this loss, but surprisingly lawmakers in 2004 and 2005 failed to even exercise oversight on this issue. For the tax-base starved communities of Western and Northwest Alaska, the loss of revenue sharing cut their budgets by more than a third.

Senator Stevens's term as Chairman of the Appropriations Committee concludes.

Russian Mission joins RUC to become the 4th member.

2005 – Upper Kalskag becomes the 5th member of RUC.

Alakanuk becomes 6th member of RUC.

Approximately 38% of village water systems are classified as Significant Non-Compliers by the US EPA and the State of Alaska.

Approximately 47 % of rural community water systems lack appropriately certified water treatment plant operators. Fourteen percent have no certified operator at all.

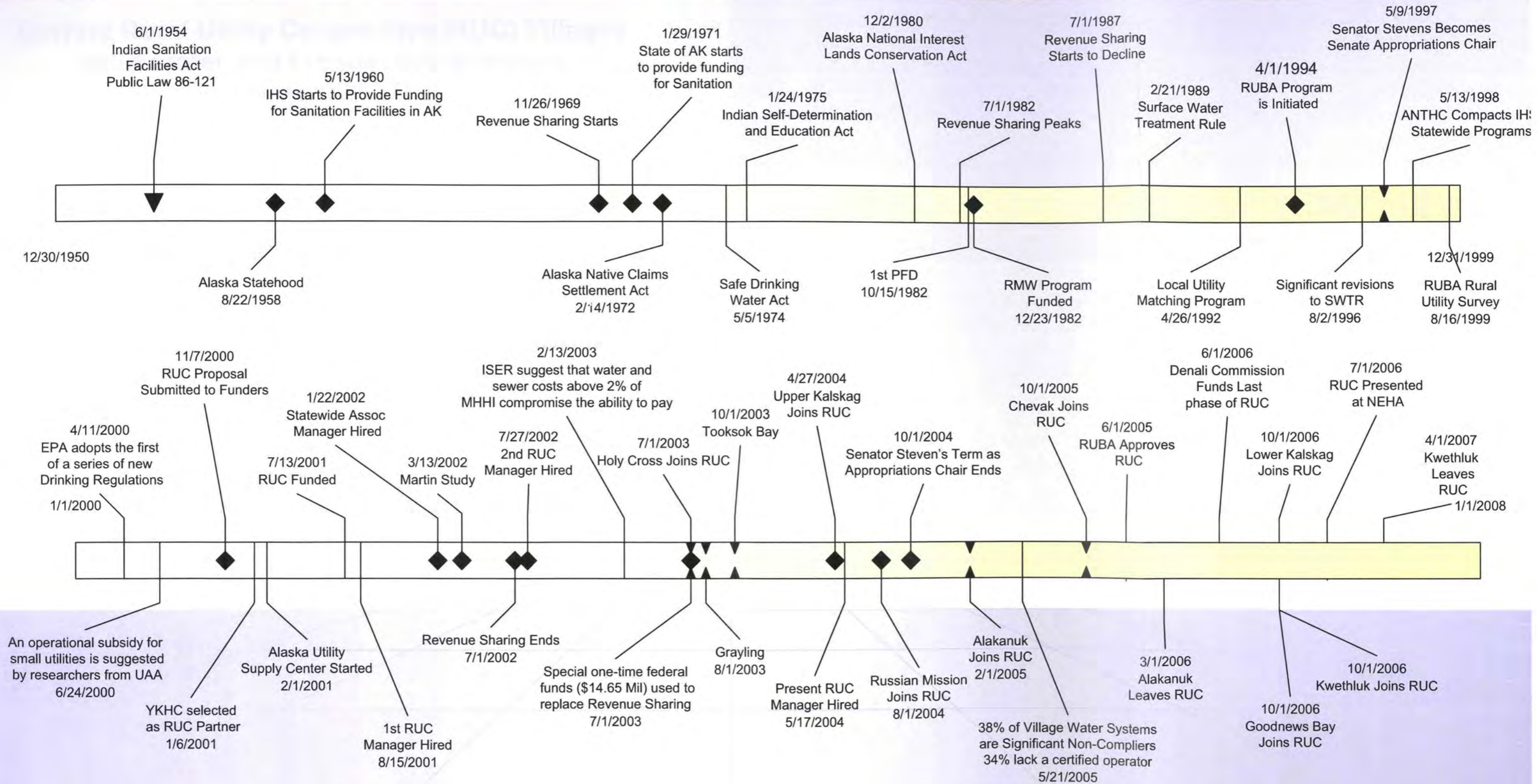
Mid-project evaluation of the RUC.

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- (1) <http://arcticcircle.uconn.edu/SEEJ/Landclaims/ancsa1.html>
- (2) Institute of Social Economic Research (2000). Executive summary. *Financing Water and Sewer Operations and Maintenance in Rural Alaska*, S7.
- (3) Colt, A., Goldsmith, S., Wiita, A. (2003). Sustainable Utilities in Rural Alaska: Effective Management, Maintenance and Operation of Electric, Water, Sewer, Bulk Fuel, Solid Waste. 6-7.

RUC DEVELOPMENT AND THE IMPACT OF EVENTS ON RURAL ALASKA SANITATION

7-31-2007



Appendix C

Current Rural Utility Cooperative (RUC) Villages and Former and Prospective Members (August 2007)

Table C-1 Current RUC Villages

Current Villages	Current Population	2000 Population	THO	MHHI
Holy Cross	204	227	YKHC	\$21,875
Grayling	174	194	YKHC	\$21,875
Toksook Bay	598	532	YKHC	\$30,208
Russian Mission	329	296	YKHC	\$27,500
Upper Kalskag	271	230	YKHC	\$28,333
Chevak	908	765	YKHC	\$26,875
Lower Kalskag	269	267	YKHC	\$25,625
Goodnews Bay	242	230	BBAHC	\$16,250
	2995	2741		

Table C-2 Former and Prospective RUC Members

Former and Prospective Members	Current Population	2000 Population	THO	MHHI
Alakanuk	663	652	YKHC	\$26,346
Kwethluk	721	713	YKHC	\$25,417
Akiak	367	309	YKHC	\$26,250
Mountain Village	796	755	YKHC	\$31,250
Pilot Station	574	550	YKHC	\$31,071
	3121	2979		

Appendix D

2006 Consolidated Village Budget (YKHC)

2006 CONSOLIDATED VILLAGE BUDGETS
SCHOOLS USE 10% OF WATER PRODUCTION @ 10 CENTS PER GALLON

	HOLY CROSS	TOKSOOK BAY	GRAYLING	RUSSIAN MISSION	UPPER KALSKAG	ALAKANUK	COMBINED	CHEVAK Jan 2006	LOWER KALSKAG Mar 2006	PILOT STATION May 2006	KWETHLUK Jul 2006	
Connections	66	81	45	87	55	120	454	193	55	66	91	859
PERSONNEL												
Water Plant Operator, Assistant	\$36,332	\$39,752	\$34,474	\$34,932	\$13,704	\$48,000	\$207,194	\$64,032	\$20,110	\$15,138	24,012	330,486
YKHC Benefit Package @ 33%	\$11,990	\$13,118	\$11,376	\$11,528	\$4,522	\$15,840	\$68,374	\$21,131	\$6,636	\$4,996	7,924	109,060
	\$48,322	\$52,870	\$45,850	\$46,460	\$18,226	\$63,840	\$275,568	\$85,163	\$26,746	\$20,134	31,936	439,547
COST OF OPERATIONS												
Electricity	\$10,359	\$9,048	\$19,655	\$9,158	\$2,400	\$30,000	\$80,620	\$20,010	\$11,465	\$4,316	2,290	118,702
Fuel	\$28,947	\$28,581	\$18,041	\$28,635	\$0	\$28,000	\$132,204	\$18,676	\$10,524	\$12,061	7,159	180,625
Replacement Parts	\$7,186	\$5,510	\$10,996	\$6,502	\$7,548	\$10,000	\$47,743	\$6,670	\$6,414	\$2,994	5,000	68,821
Consummable Supplies	\$600	\$599	\$600	\$1,200	\$2,400	\$1,200	\$6,599	\$800	\$350	\$250	300	8,299
Postage	\$24	\$29	\$24	\$24	\$24	\$25	\$150	\$17	\$14	\$10	6	196
Freight	\$653	\$79	\$80	\$0	\$0	\$0	\$812	\$0	\$46	\$272	50	1,181
Telephone	\$408	\$600	\$515	\$0	\$600	\$800	\$2,923	\$534	\$300	\$170	300	4,228
	\$48,179	\$44,446	\$49,911	\$45,519	\$12,972	\$70,025	\$271,051	\$46,707	\$29,115	\$20,074	15,104	382,052
Other Expenses								\$0				
Travel and Per Diem	\$380	\$1,130	\$1,913	\$1,752	\$600	\$1,500	\$7,274	\$1,001	\$1,116	\$158	438	9,987
Regulatory Testing	\$1,700	\$1,500	\$2,800	\$2,900	\$800	\$7,200	\$16,900	\$4,802	\$1,633	\$708	725	24,769
Contract Labor (Village)	\$3,576	\$3,194	\$2,071	\$0	\$0	\$500	\$9,341	\$334	\$1,208	\$1,490	2,500	14,873
Contract Labor (Accounting)	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$25,200	\$2,801	\$2,450	\$1,750	1,050	33,251
	\$10,635	\$9,037	\$6,739	\$4,431	\$9,859	\$13,400	\$54,100	\$8,938	\$3,931	\$4,431	4,713	76,114
TOTAL DIRECT COST	\$107,135	\$106,352	\$102,501	\$96,409	\$41,057	\$147,265	\$600,720	\$140,807	\$59,792	\$44,640	51,753	897,712
Revenues Generated from Billing	\$84,706	\$133,092	\$107,083	\$104,004	\$47,400	\$194,190	\$670,474	180080	\$62,465	\$35,294	34,110	982,423
20% Residential not collected	\$9,296	\$11,844	\$6,972	\$10,248	\$5,880	\$21,336	\$65,576	36016	\$4,067	\$3,873	6,822	116,354
Shortfall	(31,725)	14,896	(2,390)	(2,653)	463	25,589	4,179	3,257	(1,394)	(13,219)	(24,465)	(31,643)
YKHC Indirect @ 25%	\$26,784	\$26,588	\$25,625	\$24,102	\$10,264	\$36,816	\$150,180	\$35,202	\$14,948	\$11,160	12,938	224,428
Total Shortfall	(\$58,509)	(\$11,693)	(\$28,015)	(\$26,756)	(\$9,801)	(\$11,227)	(\$146,001)	(\$31,945)	(\$16,342)	(\$24,379)	(37,404)	(256,071)

Appendix E

2007 RUC Community Annual Budgets

2007 Consolidated Village Budgets

	Holy Cross 65	Grayling 52	Toksook Bay 113	Russian Mission 75	Upper Kalskag 51	Chevak 184	Lower Kalskag 87	Goodnews Bay 75
Connections								
Personnel								
Water Plant Operator, Assistant with YKHC Benefit Package @ 33%	\$ 34,161	\$ 30,085	\$ 53,805	\$ 33,067	\$ 19,312	\$ 109,454	\$ 29,393	\$ 48,900
Cost of Operations								
Electricity	\$ 15,000	\$ 20,000	\$ 17,000	\$ 3,500	\$ 3,200	\$ 45,000	\$ 12,000	\$ 12,960
Fuel	\$ 27,000	\$ 7,500	\$ 19,400	\$ -	\$ -	\$ 31,000	\$ -	\$ -
Replacement Parts	\$ 5,400	\$ 5,000	\$ 5,000	\$ 5,000	\$ 2,500	\$ 15,000	\$ 5,000	\$ 16,000
Consumable Supplies	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 10,000	\$ 1,100	\$ 1,700
Postage	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 150	\$ -
Telephone	\$ 900	\$ 1,000	\$ 1,500	\$ 1,600	\$ 600	\$ 350	\$ 960	\$ 420
Other Expenses								
Travel And Per Diem	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 1,920	\$ 1,920
Regulatory Testing	\$ -	\$ 1,400	\$ -	\$ 150	\$ -	\$ -	\$ -	\$ -
Contract Labor	\$ 10,000	\$ 3,500	\$ 5,600	\$ 3,500	\$ 10,000	\$ 12,000	\$ 7,200	\$ 8,200
Vehicle/Equipment Fuel	\$ 1,500	\$ 500	\$ 500	\$ 500	\$ 5,000	\$ 1,000	\$ -	\$ 1,160
Total Direct Cost	\$ 99,961	\$ 74,985	\$ 108,805	\$ 53,317	\$ 46,612	\$ 227,804	\$ 57,723	\$ 91,260
Revenue Generated from Billing	\$ 91,238	\$ 57,215	\$ 168,244	\$ 127,944	\$ 37,436	\$ 180,266	\$ 58,580	\$ 87,000
Shortfall	\$ (8,723)	\$ (17,770)	\$ 59,439	\$ 74,627	\$ (9,176)	\$ (47,538)	\$ 857	\$ (4,260)

Appendix F

Key Stakeholders

Key Stakeholders

Internal Stakeholders

Alaska Utility Supply Center
Division of Environmental Health and Engineering (DEHE), Alaska Native Tribal Health Consortium (ANTHC)
Boroughs of Alaska
Water Plant Operators (WPOs) – Operators of village utility systems in RUC communities
Y-K Delta communities
YKHC Yukon Kuskokwim Health Corp.
Office of Environmental Health and Engineering (OEH), Yukon Kuskokwim Health Corp. (YKHC)

External Stakeholders

Alaska Energy Authority, Bulk Fuel Loan program
Alaska Rural Water Association
Customers being served with provision of water supply and w/w treatment services in the communities throughout the Yukon-Kuskokwim (YK) Delta region.
The Denali Commission
Institute of Social and Economic Research (ISER), University of Alaska, Anchorage
National Rural Water Association
Rasmuson Foundation
Regulatory Commission of Alaska (RCA)
Rural Alaska Sanitation Coalition
Rural Alaska Training Coalition
Rural Community Assistance Corp.
Rural Utility Business Advisor Program
State of Alaska Dept. of Environmental Conservation, Division of Water, Drinking Water (DW) Program and the Village Safe Water Program
Statewide Utility Association
U.S. Dept. of Agriculture, Rural Development (USDA—RD)
U.S. Environmental Protection Agency
U.S. Housing and Urban Development (Funding Housing in Villages)
U.S. Indian Health Service (major source of funds for infrastructure)
U.S. Internal Revenue Service—Rural Alaska Pilot Project (RAPP)




 This Regional Utility Cooperative Project is Supported and Financed by the Denali Commission and its Partners
 

August 2003
 

