



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Alaska Rural Utility Collaborative Report on Activities 2015





In remembrance, and loving memory of

John William Spriggs

“The Father of ARUC”

*Former United States Public Health Service Commissioned Corps Officer and
Alaska Native Tribal Health Consortium’s Tribal Utility Coordinator*

John was employed with the Department of Rural Utility Management Services as the Tribal Utility Coordinator for 11 years. John was sought out to fill this position due to his knowledge of Alaska, professional skill, and dedication to improving public health. As ARUC’s first employee, John accomplished many things during his time with ANTHC:

- Wrote the book on the Alaska Rural Utility Collaborative: Strength in Numbers: How to Form a Rural Utility Cooperative*
- Assisted with the formation of the Rural Utility Cooperative (RUC)*
- Created the Assisted Billing Program*
- Created the Alaska Utility Supply Center (AUSC)*
- Led the creation of the Alaska Rural Utility Collaborative (ARUC)*

John was best known for his outgoing and caring personality. John was successful as he was a true people person; he had a genuine interest in others’ lives, and often left them with his caring support and guidance. No matter where John went throughout Alaska, he made many meaningful friendships.

John retired from ANTHC in summer 2013 after discovering he had stage 4 renal cell cancer. Unfortunately, after more than two years of treatment, John passed away on October 24, 2015 surrounded by family and loved ones.

John was a great man, one who valued and dedicated himself to improving the lives of those he came in contact with. In John’s honor, the ARUC program, and its staff dedicate this report to John William Spriggs for his vision, and unwavering passion towards ARUC’s success.

Empowering communities in rural Alaska to sustainably provide safe water and sanitation services.

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Background and History of the Alaska Rural Utility Collaborative

Why ARUC was created

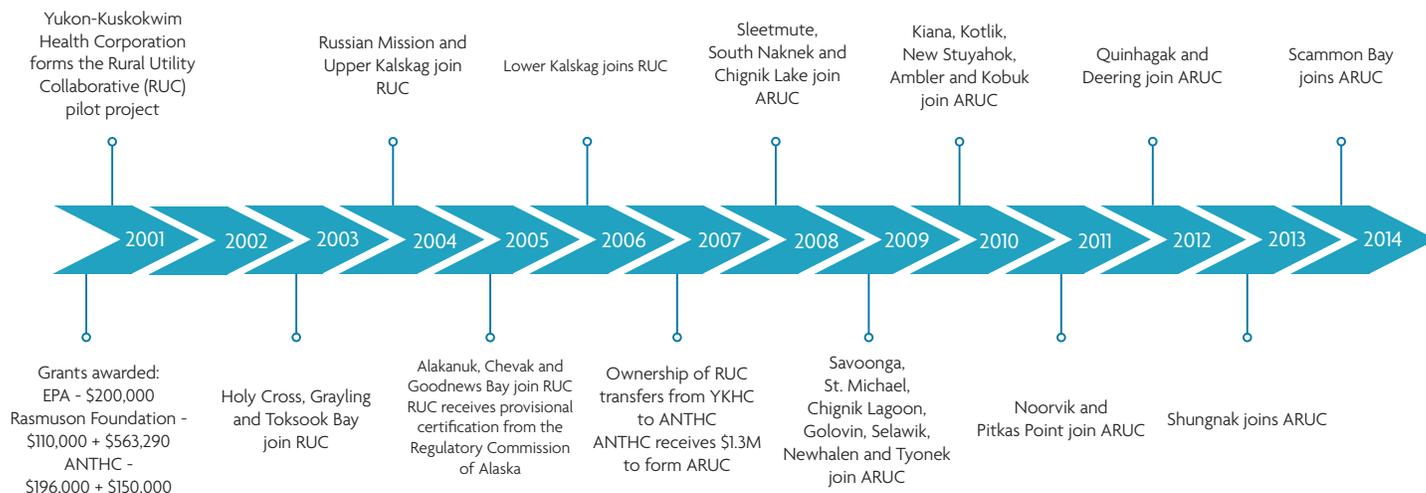
The Alaska Rural Utility Collaborative (ARUC) is a program created to manage, operate, and maintain water and sewer systems in rural Alaska. ARUC provides 'strength in numbers', with 27 villages working together instead of struggling alone.

History

The Rural Utility Cooperative (RUC) began in 2004 as a pilot program of the Yukon-Kuskokwim Health Corporation and served three communities in the Yukon-Kuskokwim region in its first year: Holy Cross, Grayling and Upper Kalskag. The following year in 2005, three more communities joined RUC: Alakanuk, Chevak and Goodnews Bay. That same year RUC received a provisional certification from the Regulatory Commission of Alaska. One year later in 2006, Lower Kalskag joined RUC. The RUC transferred ownership of the program to ANTHC in October 2007, and the program name changed from RUC to the Alaska Rural Utility Collaborative, or ARUC, on January 1, 2008.

ARUC experienced rapid membership growth during the two years after the program transferred to ANTHC. From 2008 to 2010, 15 communities joined ARUC. The program went from serving six communities from 2004 to 2006, to serving a total of 21 by 2010. This rapid expansion assisted a number of communities in need, but quickly created a financial and operational strain on staff and ANTHC, with losses in 2009, 2010 and again in 2012.

In 2013, ARUC's focus shifted from rapid expansion to improving the quality of management and technical assistance to our existing communities. Since 2013, ARUC has focused on providing improved service to existing customers through additional training to build local capabilities and creating more options for billing and service. Over the past couple of years, ARUC has added two more communities: Shungnak and Scammon Bay. ARUC now has a total of 27 communities.



About the Advisory Committee

The ARUC Advisory Committee serves as the liaison between ARUC and the participating communities, and provides advice and recommendations to ANTHC and to participating communities.



ARUC Staff



What is the Alaska Rural Utility Collaborative (ARUC)?

ARUC's goals are to protect public investments by prolonging the life of each water system, providing good drinking water every day and building local capacities.

As a testament to the effectiveness of ARUC's cooperative approach with small communities, ARUC has grown from six communities in the pilot program to 27 communities today.

ARUC is an Alaska Native Tribal Health Consortium (ANTHC) program created to manage, operate and maintain water and sewer systems in rural Alaska. ARUC treats each community system as a stand-alone nonprofit business. Revenue from local customers, generated from user fees and local community and regional support, must be enough to pay for the system's direct expenses. ARUC services include helping set water and sewer rates in each community, billing local water and sewer customers, providing supervision to local water plant operators, and more.

Through active management and operations and maintenance support, ARUC has pursued its goals of maximizing the public health benefits of sanitation facilities and building local community capabilities. Through reliable sanitation, ARUC focuses on preventive health.

ARUC's community mission is to protect the public health and the quality of life of Alaska Native community residents by:

- Ensuring that qualified staff operate and maintain facilities to provide high quality drinking water and safely dispose sewage
- Providing strength in numbers and emergency response
- Extending the useful life of systems through prevention and maintenance, thereby saving millions of federal and state dollars in replacement costs
- Hiring and training water plant operators and backup staff in each community with good wages and benefits
- Setting rates with community council agreements; each community's rates are set to be self-supporting and rates vary per community
- Providing trained ANTHC engineers, operations and maintenance specialists, utility managers and grant specialists to support the utility at no additional cost to customers

ARUC Benefits and Types of Membership

There are two types of membership within ANTHC's ARUC statewide program: the **Assisted Billing Program** and the **full ARUC membership program**.

Assisted Billing Program

The Assisted Billing Program bills, collects and provides banking services for enrolled communities and returns 94 percent of the revenue collected to the community. This program provides enrolled communities with water and sewer system billing management and collection from customers. Fees are collected and the payments are used to cover a monthly service fee based on the community's size. Each community will pay only its share of the expenses associated with the billing service. The remainder is sent back to the community to operate its water/sewer system.

Highlights

- Manages the billing and shares customer account information with community partners
- Requires only a 30-day commitment from ANTHC and the community
- Builds partnership for potential full ARUC membership
- Provides electrical billing services

ARUC Membership

This program provides management and operations of the water/sewer system, in addition to billing services. The community must

be in the Assisted Billing Program for a minimum for one year before becoming a full ARUC member. ARUC sets rates with approval by the local partners. Community rates are set to be self-supporting, so rates vary by location. Community rates include operator costs. All revenue collected from household fees other than billing, collection and banking fees are spent on that community's operation, maintenance and improvement.

Highlights

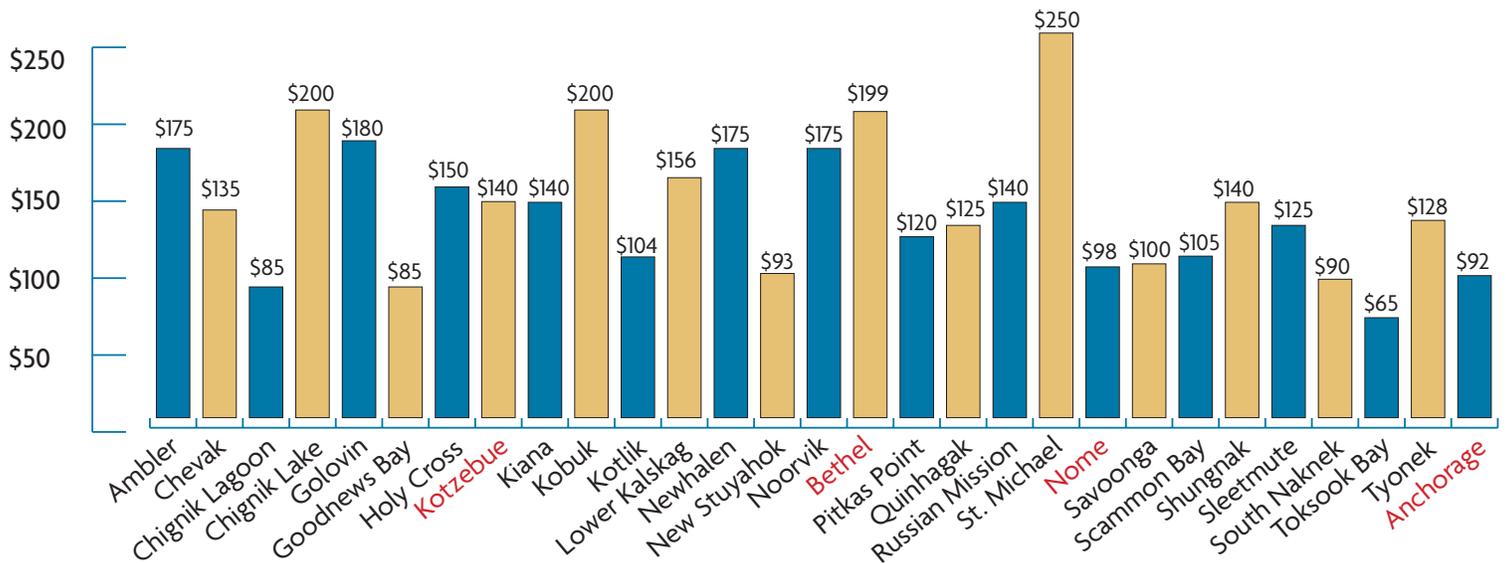
- ANTHC provides engineering, operation and maintenance advice and labor to the community at no cost.
- ARUC supports activities of locally-hired water plant operator(s) (and backup) in each community.
- All fuel, parts, electricity, etc. for water/sewer system are purchased through ARUC.
- ARUC enforces shut-off of non-paying customers.
- ARUC manages applications for grant funding to purchase fuel, supplies and needed parts and repairs for ARUC communities during their first year of membership.
- ARUC membership is a long-term commitment with contracts automatically renewing in most cases.

Summary of ARUC Community Rates

ARUC Community	Monthly Residential Rates
Ambler	\$ 175.00
Chevak	\$ 135.00
Chignik Lagoon	\$ 85.00
Chignik Lake	\$ 200.00
Deering	(Sewer only) \$ 95.00
Golovin	\$ 180.00
Goodnews Bay	\$ 85.00
Holy Cross	\$ 150.00
Kiana	\$ 140.00
Kobuk	\$ 200.00
Kotlik	\$ 104.50
Lower Kalskag	\$ 156.00
Newhalen	\$ 175.00

ARUC Community	Monthly Residential Rates
New Stuyahok	\$ 93.75
Noorvik	\$ 175.00
Pitkas Point	\$ 120.00
Quinhagak	\$ 125.00
Russian Mission	\$ 140.00
St. Michael	\$ 250.00
Savoonga	\$ 100.00
Scammon Bay	\$ 105.00
Shungnak	\$ 140.00
Sleetmute	\$ 125.00
South Naknek	\$ 90.00
Toksook Bay	\$ 65.00
Tyonek	\$ 128.25
Upper Kalskag	(Sewer only) \$ 150.00

How ARUC's Water and Sewer Rates Compare



Accomplishments

Water System Innovations and Improvements

The ARUC operations team is constantly finding ways to improve water and wastewater systems for ARUC communities. Working with local operators, the ARUC team focuses on proper maintenance and operations and identifying opportunities for energy efficiency.

Problems can easily arise in water and wastewater facilities in rural Alaska communities due to the harsh climate and aging systems. Major complications such as freeze ups, vacuum outages, and a shortage of produced water can occur. The ability to minimize and prevent problems requires a thorough understanding of the water treatment plant and innovative solutions. ARUC is fortunate that our engineers and field crew have an opportunity to be creative problem solvers.

These are some of the success stories ARUC community partnerships achieved over the past year with the help of the water treatment plant operators.

Flexible Connections - Responding to Climate Change

Many homes in Alaska have Arctic boxes that house the connections to the community's water and sewer system. Old style Arctic boxes need to be maintained with proper insulation or the homeowner risks a freeze up. Arctic boxes used for home service connections for years can pull away from homes as utility pipe shifts from warming permafrost. This shifting tears at the insulation and allows water lines to freeze. However, our local operators have developed a flexible connection, a more efficient method to prevent line freeze-ups for communities with permafrost and tundra.

When seasons change, the ground shifts during a freeze and thaw period. A flexible connection was developed to adapt to the tundra and permafrost environment without damaging homes.

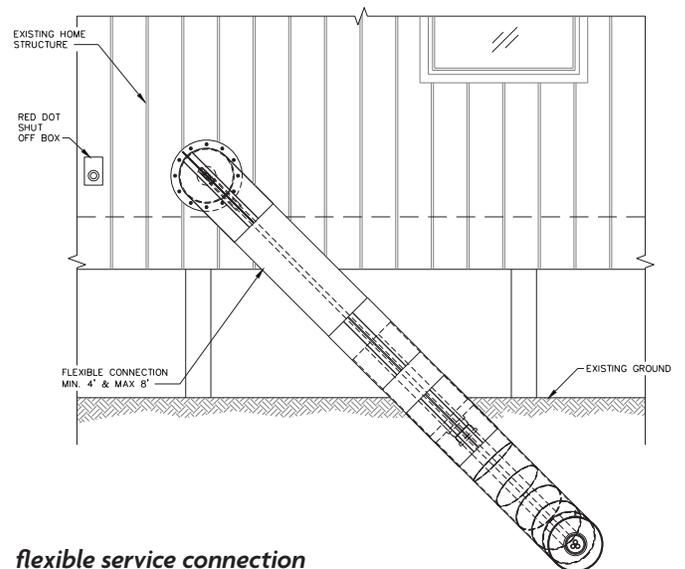
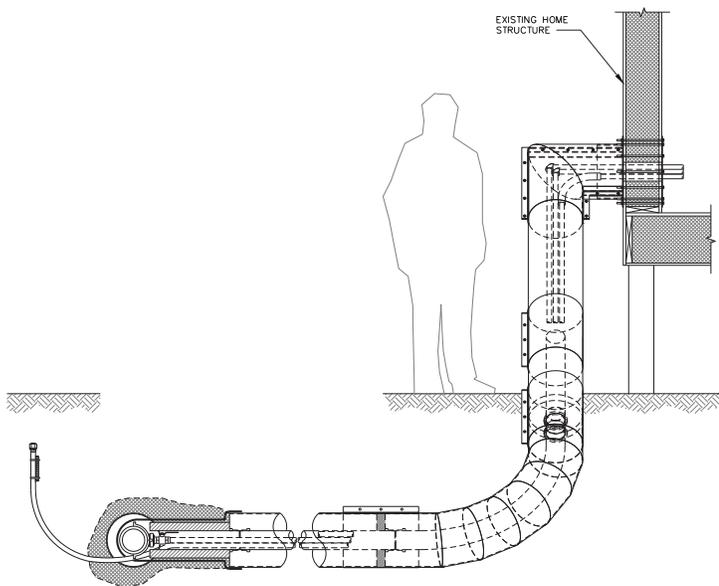
Instead of an Arctic box, a flexible pipe encompasses the home's water and sewer connections and is able to move when the ground moves.

Flexible connections are an ARUC innovation and the new ARUC standard for new service connections. Arctic boxes will be phased out.

Communities that currently have flexible connections: Ambler, Chevak, Kotlik, Noorvik, Russian Mission, Savoonga and Shungnak.



Noorvik operator, Eline Bantatua, constructing a flexible connection



flexible service connection

Automated Vacuum Pumps - Saving Money

Communities with tundra and permafrost also tend to be flat with little changes in elevation and inclination of land. Flat and level land can make it difficult to provide wastewater services since gravity is an important component in the process of moving wastewater away from homes. Vacuum pumps are used in communities with tundra to ensure reliable and effective wastewater service.

The automated vacuum pumps are an ARUC innovation that connects to remote monitoring systems and captures real time data. Old style vacuum pumps are costly to operate and frequently caused fire hazards in water plants.

The new innovative style vacuum pumps are stronger, more reliable and are able to keep a steady and consistent control of the vacuum system and can save upwards of 40 percent on electricity costs.

On top of the reduced energy costs, they do not require frequent oil changes, filter replacement and the amount of labor that the older vacuum pumps needed. An automated vacuum pump was installed in Savoonga, Chevak and St. Michael, with other communities likely to go online soon.



Savoonga operators Scott Kingeekuk (left), Derek Seppilu (middle) and Scott Toolie (right)

Service Line Work

Water service lines are the pipes connected to your house and bring drinking water into your home. All service lines need isolation valves. Isolation valves allow water to each house to be shut off in case of an emergency such as a house fire or a water leak inside the house. Isolation valves also allow water to be shut off and drained when a homeowner plans to leave the house unheated for a time during winter, or to help locate a leak in the water system.

Many older service lines have isolation valves which were placed in poor locations, such as inside or under the home. Valves located in these locations cannot be quickly shut off by water operators in case of a fire, leaking pipes inside the home, or when water leaks need to be located. One leaking water service line without an isolation valve can drain all the water in the entire water system, causing a community-wide water outage or freeze up.

In order to minimize these risks, ANTHC began developing plans to install proper isolation valves in communities. In the summer of 2015, 27 homes in Tyonek received isolation valves. Now all homes in Tyonek are able to be shut off in case of emergency. Last year, water plant operator Sam Bartels was integral to finding and repairing a buried leak that was losing 40 percent of all the water produced in Tyonek. The isolation valves installed will allow operators to find and repair such leaks much quicker in the future.

In 2015, ARUC also started a plan to replace five to 10 service line isolation valves per year in Toksook Bay. Based on the success of efforts in Tyonek and Toksook Bay, we will begin to install isolation valves where they are needed in other ARUC communities in the coming years.



Tyonek operator, Sam Bartels, installing a service valve

ARUC Start-Up

The most recent community to join ARUC was Scammon Bay in 2014. Water treatment plants and the wastewater sanitation system can require a significant amount of work to be completed when joining ARUC. ARUC start-up funds are typically used for repairs, energy audits and remote monitoring of the community's water and wastewater system.

Some of the Scammon Bay start-up work included upgrades to the low pressure sewer system and upgrades to the water treatment plant such as insulation and re-piping. In addition, circulating pumps were installed in some homes. To finalize the start-up work in Scammon Bay, the ARUC operations team will: finish installation of circulating pumps in homes, perform service line weatherization and repair, and complete slope stabilization near the water tank.



Toksook Bay operators Richard Curtis and Jeff Curtis with ARUC assistant engineering project manager John Street working on service line rehabilitation.

System Solutions

Deering vacuum system

During the first six months of 2015, ARUC's operation team made several trips to Deering to diagnose and make repairs to the vacuum system with local water plant operators. The Deering vacuum system failures were resolved through carefully isolating possible causes of air leaks in the wastewater vacuum system. Prior to the repair, Deering experienced failures of their wastewater vacuum system. The system was unreliable and would go down for several days at a time.

Kiana force main

In September 2015, the operations team, alongside local operators, was able to make improvements to the force main in Kiana and installed high density polyethylene (HDPE) pipe clamps. Through the use of remote monitoring and the use of HDPE clamps, Kiana has not experienced any further problems with their force main. Before the improvements were made, Kiana had experienced problems with fuel and jetting in their force main. There were also instances of sewage backing up and causing an environmental hazard in the community.



ARUC Utility Operations Specialist Elmer Rokook and Deering Operator Bruce Barr work on the vacuum system

2015 Energy Efficiency Projects

Energy costs are the second highest expense for community water treatment and wastewater systems in rural Alaska. With work that focuses on energy efficiency and cost savings in our utilities, a natural partnership has developed between ARUC and ANTHC's Rural Energy Initiative. The ANTHC Rural Energy Initiative began in 2010 as a way to identify opportunities for energy efficiency and renewable energy implementation in communities throughout Alaska.

Over time, more sustainable water and wastewater systems could result in a decrease in the utility rates for communities.

ARUC operators often lead these project activities with assistance from the ARUC operations team.

Ambler Energy Efficiency

In December 2015, ANTHC completed energy efficiency improvements to the lift station and training in Ambler to help the community's system run more effectively. Improvements include new controls, new lighting, weatherization, and additional customized energy efficiency efforts. In the Ambler lower lift station, controls were fixed to prevent the pumps from running 24/7 and fixed a leak in the upper lift station. The project was funded by the U.S. Rural Development Rural Alaska Village Grant, the State of Alaska and the Denali Commission.

Kobuk Biomass

ANTHC worked with Kobuk to install a Garn 100 biomass boiler in spring 2015. It is estimated to save Kobuk \$25,000 in diesel costs per year. About \$15,000 of this savings will go towards paying for cord wood from local wood cutters, providing a new source of income for people in Kobuk. An energy audit of the sanitation system was conducted in December 2014. Energy efficiency improvements in 2015 included controls replacement, new lighting, minor weatherization and other energy efficiency improvements in the sanitation system.



Kobuk Operator Kris McKay loading the biomass boiler



Quinhagak operator Frank Jones at the water treatment plant

This project is estimated to save the community \$8,000 in energy costs per year. A remote monitoring system was installed in spring 2015 to remotely identify problems and help in preventing catastrophic failures such as freeze-ups. This project was funded by the U.S. Environmental Protection Agency (EPA).

Quinhagak Recovered Heat

ANTHC worked with the Native Village of Quinhagak, to capture recovered heat from the Alaska Village Electric Cooperative (AVEC) power plant for use in heating the utility building and community washeteria, with funding from the State of Alaska's Alaska Energy Authority Renewable Energy Fund and the EPA. Construction began in August 2015 and was funded by Rural Development, the Denali Commission and the State of Alaska.

The Quinhagak heat recovery system is estimated to save the community 14,200 gallons in heating fuel annually.

Savoonga Improvements

Energy efficiency improvements and operator training were conducted at the Savoonga sanitation system in November 2015. The energy efficiency improvements included boiler tuning, weatherization, interior lighting, exterior lighting, and controls improvements. This energy efficiency work has an estimated savings of \$8,000 per year, and almost no fuel was needed for the Savoonga water treatment plant since the project was completed. This project was funded by Rural Development, the Denali Commission, and the State of Alaska.

ARUC Training and Technical Assistance

ARUC operators have the opportunity to attend trainings that help them manage water plant operations more effectively and efficiently, saving more energy costs for communities each year. Trainings provide operators an opportunity to become certified in a number of areas related to water treatment and wastewater treatment or maintain certificates through continuing education units.

ANTHC's Division of Environmental Health and Engineering offered two trainings geared for water plant operators through a grant from the State of Alaska Department of Labor and Workforce Development. Water Treatment Level I/Water Distribution Level I and Sanitation Energy Efficiency took place at the Alaska Vocational Technical Center in Seward.

The Water Treatment Level I/Water Distribution Level I training is designed to prepare operators for the provisional exam to become certified water plant operators. The Sanitation Energy Efficiency training covered a broad range of topics including boilers and heating principles, heating controls and electrical energy usage.

The goal of the training is that operators have a better understanding of operations and maintenance of their community's water plant and how to save energy and heating costs.

In addition to these classroom learning opportunities, ARUC field staff also provide training and technical assistance to operators when they travel to their communities on the operation of their water treatment plant.



Pitkas Point operator Paul Lamont during a United States Department of Agriculture Rural Alaska Village Grant training



Twelve operators from across Alaska attended the first ANTHC energy training

2015 Training Sessions

Anchorage

- Alaska Rural Water Association Training Conference
- ARWA (October 2015)
- Electrical Controls and Water Distribution (December 2015)

Bethel

- Intro to Small Water Systems (October 2015)
- Level 1 Water Systems Training (November 2015)
- Cross Connection Control class (September 2015)

Dillingham

- Small Water System Treated/Untreated (April 2015)

Kotzebue

- Small Treated Water Systems/Wastewater lagoon (April 2015)
- Wastewater collection/Wastewater lagoon (December 2015)

Seward

- Water Treatment I/Water Distribution I (May and August 2015)
- Sanitation Energy Efficiency (June 2015)

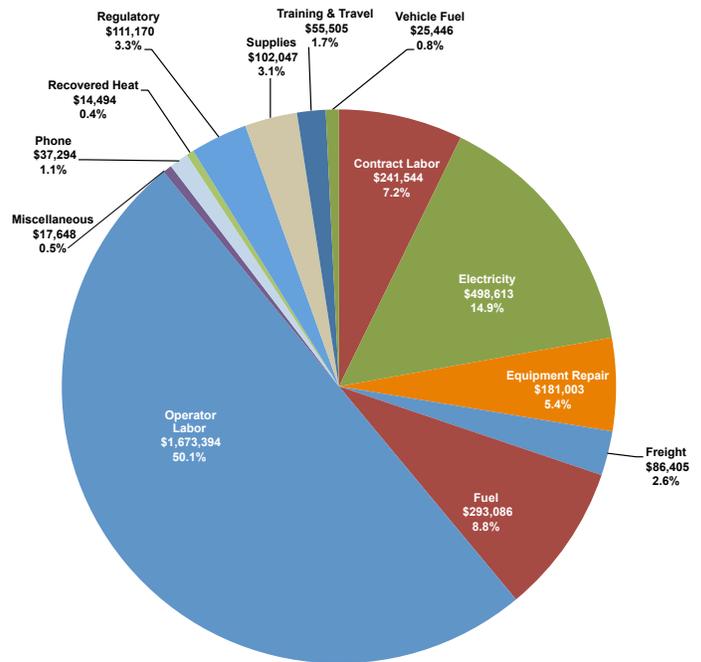
ARUC Community Financial Information

The Alaska Rural Utility Collaborative’s partnership with 27 communities continued to make significant financial improvements throughout 2015. In fiscal year 2015, community revenue was about \$1,082,000 higher than expenses, meaning more ARUC communities collected adequate revenue to pay system expenses, and put money into their reserve accounts. This was an improvement over FY14, revenue was about \$637,000 above expenses.

ARUC tracks the percentage of villages with fully funded reserve accounts ensuring each system has sufficient funds saved for emergencies, parts and repairs. In FY15, 55.6 percent of the 27 villages met this goal. We continue to improve financial management so all ARUC communities have money in reserves for replacement parts, fuel and emergencies throughout FY16.

Fiscal Year 2015 Revenue	
User Fees - ARUC	\$ 4,329,995.43
Community Subsidies	\$ 90,000.00
Subtotal Revenue	\$ 4,419,995.43
Fiscal Year 2015 Expenditures	
Contract Labor	\$ 241,544
Electricity	\$ 498,613
Equipment Repair	\$ 181,003
Freight	\$ 86,405
Fuel	\$ 293,086
Operator Labor	\$ 1,673,394
Miscellaneous	\$ 17,648
Phone	\$ 37,294
Recovered Heat	\$ 14,494
Regulatory	\$ 111,170
Supplies	\$ 102,047
Training & Travel	\$ 55,505
Vehicle Fuel	\$ 25,446
Subtotal Expenses	\$ 3,337,649.84

ARUC FY 15 Annual Expenses

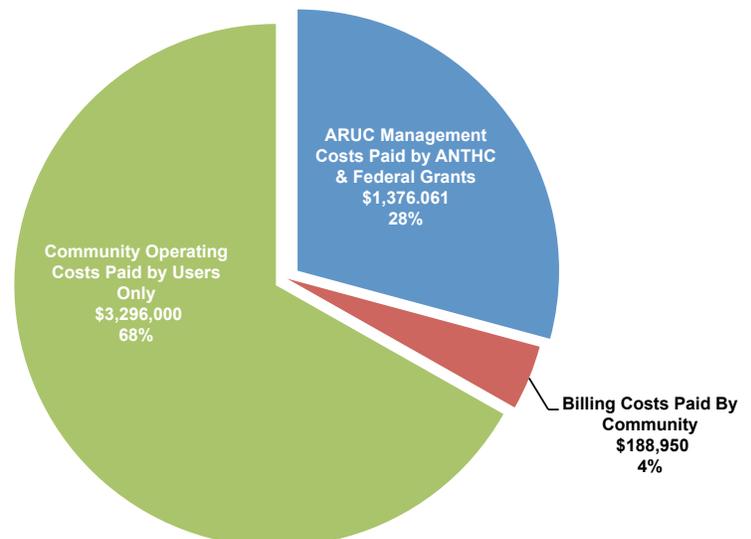


ARUC FY15 Operating Revenue and Expenses

Revenues collected from each community are used to pay that community’s system expenses only. Some included expenses are water plant operator labor, electricity, fuel, parts, supplies, regulatory testing, billing service fees, and so much more.

ARUC management staff costs are funded by ANTHC and federal grants only.

ARUC FY 15 Operating Costs

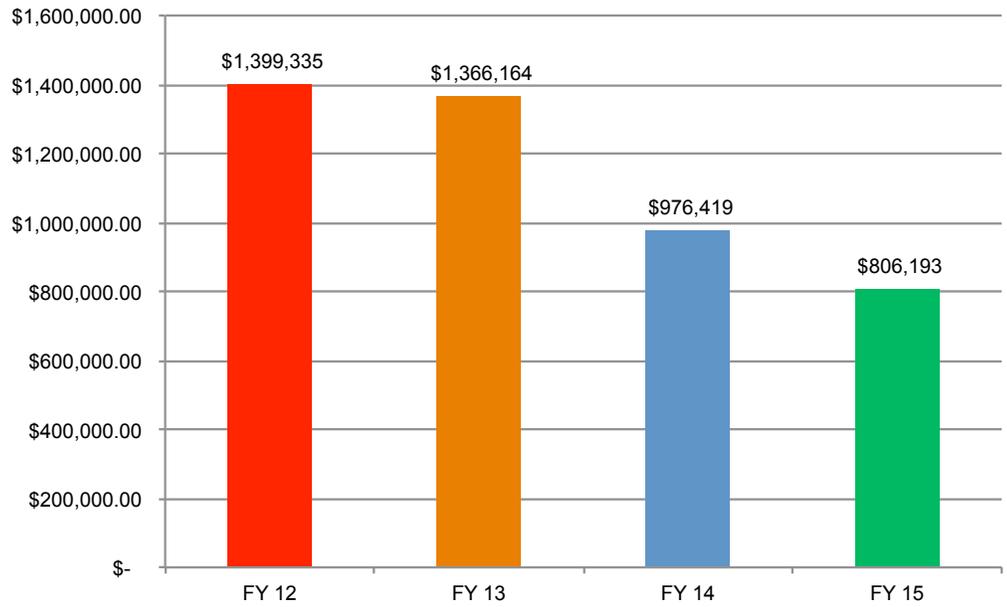


Improved Energy and Operational Efficiency

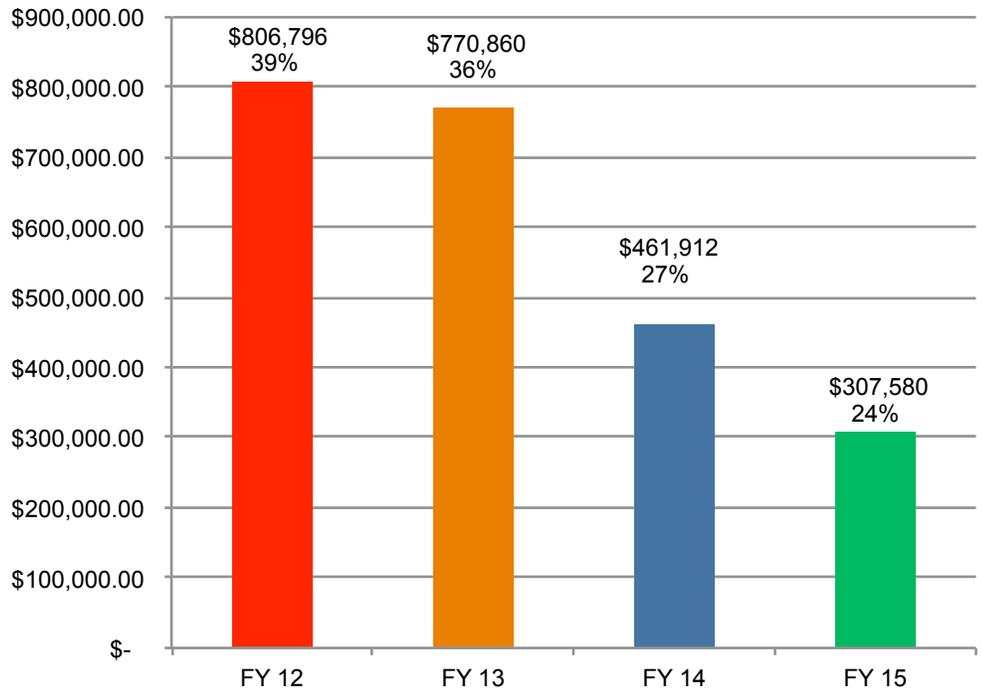
In FY14, energy accounted for 27 percent of ARUC village water/ sewer expenses. In FY15, energy expenses were reduced to 24 percent of total expenditures. This decrease in energy usage is the result of our work with ANTHC's Rural Energy Initiative on energy efficiency projects. Energy efficiency upgrades include installing waste heat, wind-to-heat, and biomass systems.

These projects utilize sustainable sources of energy to offset fuel and electricity consumption. Minor upgrades such as converting lights to LED, installing precise controls and optimizing operations have also aided in reducing energy consumption.

ARUC Energy Costs By Year



Cost of Purchased Heating Fuel By Year



Quyana/Taikuu!

The Alaska Rural Utility Collaborative would like to thank the many cities, Tribes, regional health corporations, borough offices and funders for partnering with us to ensure that communities receive safe water and sanitation services every day. It is our belief that through partnerships and collaboration, our work can empower communities in rural Alaska and create sustainable systems for future generations.

Alaska Energy Authority (AEA)
Alaska Rural Water Association (ARWA)
Alaska Vocational Technical Center (AVTEC)
Bristol Bay Area Health Corporation
Bristol Bay Borough
Chignik Lake Traditional Village Council
City of Ambler
City of Chevak
City of Deering
City of Golovin
City of Holy Cross
City of Kiana
City of Kobuk
City of Kotlik
City of Lower Kalskag
City of New Stuyahok
City of Newhalen
City of Noorvik
City of Quinhagak
City of Russian Mission
City of Saint Michael
City of Savoonga

City of Scammon Bay
City of Shungnak
City of Toksook Bay
City of Upper Kalskag
Department of Environmental Conservation (DEC)
Indian Health Service (IHS)
Lake & Peninsula Borough
Maniilaq Association
NANA Regional Corporation
Native Village of Chignik Lagoon
Native Village of South Naknek
Native Village of Tyonek
Northwest Arctic Borough
Norton Sound Health Corporation
Pitkas Point Village Council
Rasmuson Foundation
Sleetmute Traditional Council
State of Alaska Rural Utility Business Advisor (RUBA)
United States Department of Agriculture (USDA)
Village of Goodnews Bay
Yukon-Kuskokwim Health Corporation



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