ALASKA STATE LEGISLATURE
JOINT MEETING
HOUSE SPECIAL COMMITTEE ON ARCTIC POLICY,
ECONOMIC DEVELOPMENT, AND TOURISM
HOUSE SPECIAL COMMITTEE ON TRIBAL AFFAIRS
April 27, 2021
8:03 a.m.

MEMBERS PRESENT

HOUSE SPECIAL COMMITTEE ON ARCTIC POLICY, ECONOMIC DEVELOPMENT, AND TOURISM

Representative Grier Hopkins, Chair
Representative Sara Hannan
Representative Liz Snyder
Representative Josiah Patkotak
Representative Harriet Drummond
Representative Mike Prax
Representative Tom McKay

HOUSE SPECIAL COMMITTEE ON TRIBAL AFFAIRS

Representative Tiffany Zulkosky, Chair
Representative Dan Ortiz
Representative Zack Fields
Representative Geran Tarr

MEMBERS ABSENT

HOUSE SPECIAL COMMITTEE ON ARCTIC POLICY, ECONOMIC DEVELOPMENT, AND TOURISM

All members present

HOUSE SPECIAL COMMITTEE ON TRIBAL AFFAIRS

Representative Mike Cronk

COMMITTEE CALENDAR

PRESENTATION: SANITATION IN RURAL ALASKA

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

BRIAN LEFFERTS, MPH, REHS, DAAS
Office of Environmental Health and Engineering
Yukon-Kuskokwim Health Corporation
Bethel, Alaska
POSITION STATEMENT: Presented a PowerPoint, entitled "Water & Wastewater in Rural Alaska."

AARON DOTSON
Vice Chancellor of Research
University of Alaska Anchorage
Anchorage, Alaska
POSITION STATEMENT: Presented a PowerPoint presentation entitled, "ARWSWG; Alaska Rural Water and Sanitation Working Group."

JACK HÉBERT, Founder
Cold Climate Housing Research Center
Fairbanks, Alaska
POSITION STATEMENT: Gave a PowerPoint presentation entitled, "Efficient, Healthy Housing for our People."

BOB TSIGONIS, Founder
Lifewater Engineering Company
Fairbanks, Alaska
POSITION STATEMENT: Gave a PowerPoint presentation entitled, "Sanitation in rural and remote Alaska."

DAVID BEVERIDGE, Interim Senior Director
Division of Environmental Health and Engineering, Alaska Native Tribal Health Consortium
Anchorage, Alaska
POSITION STATEMENT: Gave a presentation on sanitation in rural Alaska.

ACTION NARRATIVE

8:03:22 AM

CHAIR GRIER HOPKINS called the joint meeting of the House Special Committee on Arctic Policy, Economic Development, and Tourism and the House Special Committee on Tribal Affairs to order at 8:03 a.m. Present at the call to order from the House Special Committee on Arctic Policy, Economic Development, and

Tourism, were Representatives McKay, Patkotak, and Hopkins. Representatives Snyder, Prax, Drummond, and Hannan arrived as the meeting was in progress. Present at the call to order from the House Special Committee on Tribal Affairs, were Representatives Ortiz and Fields. Representatives Zulkosky and Tarr arrived as the meeting was in progress.

PRESENTATION: Sanitation in Rural Alaska

8:04:40 AM

CHAIR HOPKINS announced that the only order of business would be a presentation on Sanitation in Rural Alaska.

8:05:30 AM

BRIAN LEFFERTS, MPH, REHS, DAAS, Office of Environmental Health and Engineering, Yukon-Kuskokwim Health Corporation, gave a PowerPoint presentation, entitled "Water & Wastewater in Rural Alaska," [hard copy included in the committee packet], during the overall presentation on Sanitation in Rural Alaska. He drew attention to slide 2, "Service Delivery Types," which shows photos of the following types: a pipe system; a honey bucket system for homes with no pressurized water system; a small, closed hole system - usually about a 110 gallon trailer hooked up to an all-terrain vehicle (ATV) that can deliver water to a house; a separate trailer that hauls away about the same amount of waste water; and a large haul system, which can deliver about 3,000 gallons to a house. He added that tanks vary in size but the ones in Bethel are about 1,000-gallon capacity.

MR. LEFFERTS drew attention to slide 3, "Barriers to Water Use," and he remarked that throughout the world, as access to water is increased, consumption of water also increases. He talked about the varying amount of use of water based on the methods of procuring it. He showed slide 4, "Closed-Haul Systems," which gives information gathered from one community in the Yukon-Kuskokwim (Y-K) Delta over the course of a year, as follows [original punctuation provided]:

- Small Closed Haul (120 gal haul tank)
    - 2016/2017 household average
        - 6.7 water hauls (804 gallons per year)
        - 12.1 sewer hauls (1,452 gallons per year)
        - Washeteria usage (3,318 gallons per year)
            - 82,100 gallons for laundry
            - 8,000 gallons for showers

- 1.45 gpcd correction for self disposal and travel
- 2.16 gpcd (YKHC) - 3.72 gpcd (Altiok, 2011)

- Large Closed Haul (3,000 gal haul tank)
  - The median rate for haul customers in Bethel is 1,000 gallons per week.
  - 35.6 gpcd
  - 10 times the amount used in small closed-haul systems

8:09:00 AM

MR. LEFFERTS directed attention to slide 5, "Water Sanitization and Health," which read as follows [original punctuation provided]:

- Handwashing, hygiene, bathing have been shown to reduce spread of communicable illnesses

- These are considered "water-washed" diseases: even though they are not directly transmitted through water, their transmission is linked to water availability and its relationship with hygiene.

- Other potential impacts: dishwashing, laundry, general cleaning, poverty reduction

- Estimate ranges:
  - 5 (20 L) gpcd essential for short-term survival
  - 16 (60 L) gpcd minimum in CRUM
  - 26 (100 L) gpcd long-term consumption and hygiene needs

MR. LEFFERTS turned to slide 6, a continuation of "Water Sanitation and Health," which read as follows [original punctuation provided]:

- The previous analysis identified that pneumonia/influenza visit rates, skin infection visit rates, and MRSA infection visit rates were lower in areas with water service
- In 2020 we identified the same associations between visit rates and increasing levels of piped water service, with the addition of lower rates for other respiratory infection visits as well.

- Diarrheal disease visit rates were not associated with water service in either study
- Compared to a community with no piped water service:
    - a community with 100% coverage of piped water would have 40% fewer visits for pneumonia/influenza, 20% fewer visits for other respiratory infections, 80% fewer visits for MRSA, and 40% fewer visits for other skin infections
    - a community with 100% coverage of hauled water would have 20% fewer visits for respiratory infections and 30% fewer visits for MRSA

MR. LEFFERTS spoke to further information on the slide, which shows that for every 10 percent increase in coverage, there is a 4 percent decrease in pneumonia and influenza, a 2 percent decrease in other respiratory infection, an 8 percent decrease in MRSA, and a 4 percent [when water is piped] or 3 percent [when water is hauled] decrease in other skin infection. He then showed slide 7, "Barriers to Construction," which read as follows [original punctuation provided]:

Funding, $587 Million YK Delta to address dire sanitation conditions

- State Match
    - Requires Approved Business Plan
- Best Practices Scores
- Federal Requirements
    - IHS Cost Caps
    - EPA Certified Operator Requirements

MR. LEFFERTS referred to a chart on the [right] half of slide 7, which lists funding sources, and he emphasized the necessity of having all of them in order to complete a pipe water project.

8:13:56 AM

REPRESENTATIVE TARR noted that the funding sources total $58.7 million, and the chart in total adds up to $127 million. She asked what that means on an annual basis. She asked where the costs for necessary improvements and new infrastructure are reflected.

MR. LEFFERTS replied that large-scale upgrades would be paid out of the system, while user fees gathered through local operations pay for routine maintenance and upkeep.

8:16:19 AM

REPRESENTATIVE ORTIZ asked whether the $127 million in any way addresses the $587 million needed to address the dire sanitation conditions in the Yukon-Kuskokwim (Y-K) Delta.

MR. LEFFERTS replied yes. He said the $587 "should be broken out into multiple different projects." He added that projects happen in phases and the list of projects fluctuates.

8:18:36 AM

CHAIR HOPKINS asked whether the list is made by the state and has a specific formula.

MR. LEFFERTS answered yes. He added that various systems have their own scoring system, but all projects are captured in the sanitation deficiency system (SDS).

8:19:31 AM

REPRESENTATIVE PATKOTAK, regarding the $587, inquired about operation and maintenance (O&M) costs.

MR. LEFFERTS said any large-scale operation must have a business plan showing how the system will be covered financially.

8:21:13 AM

MR. LEFFERTS returned to the PowerPoint, to slide 8, "Residential Collection Rates," and covered the information that read as follows [original punctuation provided]:

- Business Plans
    - Must meet State Affordability Matrix
    - No piped system would have been constructed under new matrix developed in 2020
    - Average monthly rate $110; Average Highest Possible Rate $49
- FY19 Analysis of 26 ARUC communities
    - Affordability Score had no impact on collection rates
- Published peer-reviewed literature shows customers with the least reliable and poorest quality service were willing to pay the most for improvements to systems

MR. LEFFERTS pointed out that there are high collection rates in communities with a high burden of authority; the collection rate drops when rates are greater than $150 per month; and a much larger impact has been found where systems do not have the ability to shut off service to customers that are not paying. He said the way the system is built has a greater impact on the revenue communities can bring in to operate it than does the maximum cost allowable set by the state for construction of the project.

8:23:35 AM

REPRESENTATIVE ZULKOSKY asked for recommendations on how the legislature could address barriers to sanitation needs related to requirements for qualification of funding.

MR. LEFFERTS answered that in addition to a continued business plan, he would like to see a realistic way for customers to be able to pay. He talked about low median income rates coupled with high percentage of people paying for services, and he indicated that people whose children become sick due to bad water quality know the importance of having a good water source.

8:25:22 AM

MR. LEFFERTS directed attention to slide 9, "Best Practice Scores," which read as follows [original punctuation provided]:

- Small, isolated communities, small labor pools, limited economies, and high rates of employee turnover all make it difficult to achieve strong financial and managerial capabilities.
- In 2017, 46% of rural utilities collected revenues sufficient to cover the costs of their operations
    - Served 83/152 55%
    - Underserved 3/10 30%
    - Unserved 3/33 9%
- A link has also been demonstrated between water system type and managerial support and Best Practices score. In Spring 2021 in the YK Delta:
    - < 30 % piped avg. best practice score: 36
    - 30-80% piped avg. best practice score: 55
    - > 80% piped avg. best practice score: 60

Ritter, 2017; State of Alaska, 2017; State of Alaska, 2021

MR. LEFFERTS said, "We're kind of putting the cart before the horse here by requiring a high best practice score in order to fund a company with a pipe system." He explained that small, isolated communities have small labor pools, limited economies, and high rates of employee turnover. He pointed out that in a community that has only a washeteria, the main source of revenue is "just quarters for a washer and dryer," and that revenue must serve to employ a full-time operator, pay for thousands of dollars in "regulatory samples," and hire a bookkeeper, et cetera. He said this is nearly impossible for these small businesses to pay for all the requirements needed in order to earn a high best practice score. Conversely, a fully piped system has more of an economy of scale, with lots of customers paying hundreds of dollars a month. Referring to the best practice scores shown on the slide, he stated that a best practice score of 60 is required in order to get construction funding for piped water systems.

MR. LEFFERTS said the Yukon-Kuskokwim Health Corporation is requesting the requirement to have a best practice score be eliminated for dire sanitation condition projects without piped systems, and that a more realistic affordability matrix be allowed regarding the residential rate from the business plan. He said this would relieve state funding for the state match, as well as help fund a lot of the essential projects addressing dire sanitation conditions in rural Alaska. In response to Representative Zulkosky, he offered his understanding that the best practice score is not in statute, but rather is "just a policy decision that the State of Alaska has made." In response to a follow-up question, he said the Department of Environmental Conservation (DEC), [Division of Water], Village Safe Water imposes the [best practice score] requirement.

MR. LEFFERTS directed attention to the final slide, which depicts a map illustrating the remaining unserved and underserved communities. He explained that the red dots on the map are communities that primarily use honey buckets, and the green dots are communities that have 30-50 percent pipes, with many homes still unserved.

8:29:57 AM

REPRESENTATIVE TARR asked about urban versus rural equity and what would be seen in terms of critical infrastructure investment.

MR. LEFFERTS replied that most of the remaining services [needed] are among Alaska's poorest and with the highest percentage being in Native communities, and health disparities are symptomatic of systematic failure.

8:32:38 AM

CHAIR ZULKOSKY asked whether the best practice score requirement would also be imposed in areas where there might be a desire to allocate some federal relief funds.

MR. LEFFERTS replied that it would depend on how funding comes to the State of Alaska. For example, if it comes through a revolving loan from the Environmental Protection Agency (EPA), then that would require a state match, which has restrictions; currently any project for a comprehensive pipe system requires funding "from all those funding sources." He spoke about a $1 billion federal request being written to address the statewide need for dire sanitation conditions; the $587 million was for Y-K Delta alone. He expressed hope that the money would go to the most important projects.

8:34:58 AM

AARON DOTSON, Vice Chancellor of Research, University of Alaska Anchorage, presented a PowerPoint, entitled, "ARWSWG; Alaska Rural Water and Sanitation Working Group" [hard copy included in the committee packet], during the overall presentation on Sanitation in Rural Alaska. He shared that he is a member of the working group as a representative for the University of Alaska. He began on slide 1 and offered ARWSWG's mission statement, which read as follows [original punctuation provided]:

> The Working Group's mission is to maximize the health benefits of in-home water and sanitation services in rural Alaska.

He noted that slide 1 also includes a list of other ARWSWG team members who also belong to federal and state agencies, universities, and tribal health organizations.

8:36:13 AM

DR. DOTSON continued on slide 2, "ARWSWG Approach", which included a bubble graph depicting, "the core of what we do," which he stated is a focus on maximizing the health benefits of

the in-home water and sanitation services in rural Alaska. He explained that to achieve that goal, ARWSWG focuses on four specific pillars, shown on the slide, which read as follows [original punctuation provided]:

> Promote research and development of innovative approaches to water and waste-water services
>
> Develop innovative strategies for the allocation of capital funds through community-level engagement
>
> Support research on the connections between climate, water and human/environmental health
>
> Improve village level capacity (technical, financial, managerial) and enhance existing O&M via the provision of subsidies and technical assistance programs

DR. DOTSON offered clarification that although members of the House Special Committee On Arctic Policy, Economic Development, and Tourism (AET) are unable to directly change these processes, members of ARWSWG are able to influence the trajectory of those who fund this and support this work, due to ARWSWG members' connections through their respective agencies. Additionally, he stated that through the House Special Committee On Arctic Policy, Economic Development, and Tourism, the opportunity for cross-institutional collaboration can be provided that may lead to the direct approach of any one of the pillars mentioned on slide 2.

8:37:49 AM

DR. DOTSON continued on slide 3, "Alaskan Water and Sanitation Retrospective," which read as follows [original punctuation provided]:

> The purpose of this retrospective was to inform the water and sanitation industry and the general public about technologies deployed in rural Alaskan villages between ~1970 and 2005 and why the majority failed on a technical level or failed to provide adequate water on an as-used basis to improve health outcomes.

He shared with the committee that the retrospective was published in "about 2015" and represented a number of years of work. He explained that the text was predicated on an interview-based approach and created a "really sound document"

that was at the foundation of assisting those that were pursuing an effort, called "The Alaska Water Sewer Challenge". He said that this effort was shaped in some ways by the members of the House Special Committee On Arctic Policy, Economic Development, and Tourism committee.

DR. DOTSON proceeded to slide 4, "ARSWG Recent/Upcoming/Ongoing Projects and Activities," which read as follows [original punctuation provided]:

1) Alaska Water and Sewer Challenge (initiated in 2012)
2) Engineering Atlas supporter
    - Coordinating partners, expect small planning workshop
3) Development of communication strategy for public & legislature
4) ALPHA Conference - Annual Post-Conference Session Organize

DR. DOTSON explained that the Engineering Atlas project is funded by the U.S. Department of Defense (DoD) through the Environmental Security Technology Certification Program (ESTCP) with the University of Alaska Fairbanks (UAF). He expressed that the AET committee has the ability to gather individuals that would best serve the Engineering Atlas. He shared that modernization is necessary to help integrate climate and environmental data with engineering equations and theories. This integration allows for the production of maps of Alaska that provide engineering data in addition to the already available climate data, which would inform engineers on how to design structures and pikes in a way that best fits Alaska's environmental needs.

DR. DOTSON continued by explaining that communication strategy done by ARSWG is available on the group's website for public viewing. He also stated that, since 2011, ARSWG has been organizing a post-conference session in association with the ALPHA Conference in Anchorage, Alaska, which is a public health conference.

8:41:43 AM

DR. DOTSON proceeded to slide 5, "Alaska Water and Sewer Challenge," which read as follows [original punctuation provided]:

- Focused on decentralized water and wastewater treatment, recycling, and water use efficiency
- The primary goal is to significantly reduce the capital and operating costs of in-home running water and sewer in rural Alaska homes
- Project is in Phase 4 – Field System Development and Testing

DR. DOTSON said that the Alaska Water and Sewer Challenge (AWSC) stands as an example of a project that was shaped by ARSWG. He explained that this involved members of ARSWG challenging engineers to come up with an alternative and innovative pipe system. He shared that the project is currently awaiting more funding to be released by the U.S. Environment Protection Agency (EPA).

DR. DOTSON advanced to slide 6, which included a flyer for a conference, entitled "Water Innovations for Healthy Arctic Homes." He shared that this was an international, weeklong workshop held in conjunction with the U.S. Chairmanship of the Arctic Council. He said that this conference was also partially organized by the Department of Environmental Conservation (DEC). He expressed that the conference was well-attended and allowed individuals in Alaska to learn from individuals living in other Arctic countries, as well as to highlight many of the outcomes of AWSC.

8:44:02 AM

DR. DOTSON continued to slide 7, "Annual Water and Sanitation Innovations for the Arctic Workshop: ALPHA Sessions," which read as follows [original punctuation provided]:

- 2011 – State of Water/Wastewater Affairs
- 2012 – Exploring Innovative Ideas
- 2013 – Update on AK R&D & Assessing Metrics
- 2014 – Future of Washeterias
- 2015 –Wastewater Treatment and Disposal
- 2016 – Education & Outreach in Rural Water and Sanitation
- 2017 – Climate Change, Water, and Health • 2018 – Investigating impacts of inadequate water provision in rural Alaskan households
- 2018 – Investigating impacts of inadequate water provision in rural Alaskan households
- 2019 – Alternative Approaches, Focus on Gray Water Recycling Technologies

• 2020 – Prioritizing Water and Sanitation Capacity Needs • 2021 – Tracing the Pandemic in Wastewater

DR. DOTSON shared that this slide offers an idea of the integration that ARSWG does to continue to engage communities in Alaska, involving engineers, scientists, individuals in the public health field, legislators, and community members. He relayed that the "post-ALPHA" sessions have been occurring since 2011 and have been shaped by the needs of the year.

DR. DOTSON concluded his presentation by expressing that ARSWG includes a diverse group of individuals that have the ability to integrate each individual's work and portfolios from federal, state, and university perspectives with the hope to maximize the mission of ARSWG.

8:47:41 AM

CHAIR HOPKINS asked Dr. Dotson how Alaska compared to other Arctic nations in terms of healthy Arctic homes.

DR. DOTSON replied that it varies dramatically; in some ways Alaska proved to be comparatively exceptional, while in other ways funding was too different to compare Alaska's systems to those of other Arctic nations. He gave plumbing as an example of this. Alternatively, he shared that other communities like Greenland are on-par with Alaska when it comes to limited waste-water service. He concluded that Alaska ranks somewhere in the middle of the spectrum when compared to other Arctic regions, but diversity of infrastructure spans from low to high, much like other regions located in the circumpolar north.

8:49:52 AM

JACK HÉBERT, Founder, Cold Climate Housing Research Center, gave a PowerPoint presentation entitled, "Efficient, Healthy Housing for our People," during the overall presentation on Sanitation in Rural Alaska. He shared that he founded the CCHRC and also serves as the Senior Advisor for the National Renewable Energy Lab (NREL).

MR. HÉBERT proceeded to slide 2, "Cold Climate Housing Research Center Joined NREL to Expand Mission Impact", and shared that the building depicted on the slide is the CCHRC facility. He said that the facility is a "stand-alone facility," meaning that it has its own infrastructure built within it, including wastewater and potable water.

MR. HÉBERT advanced to slide 3, "CCHRC Research Areas," which read as follows [original punctuation provided]:

Building Envelopes & Materials
Energy & Mechanical Systems
Social & Economic Analysis

MR. HÉBERT explained that the slide refers to the main research areas on which CCHRC focuses. He added that a new partnership with the National Renewable Energy Laboratory (NREL) has allowed CCHRC to expand its team and resources to better help Alaskans.

MR. HÉBERT moved to slide 4, "Demonstration & Deployment," which included photos of structures that, together with community members, CCHRC has helped design and build.

MR. HÉBERT continued to slide 5, "Indigenous Wisdom", which included photos on indigenous community members. He shared that the philosophy of CCHRC is that innovation begins with the wisdom of indigenous individuals due to decades of experiences in "one of the harshest climates on earth." He said that CCHRC attempts to involve indigenous people as much as possible throughout the entire process.

8:54:00 AM

MR. HÉBERT proceeded to slide 6, "21st Century Technology," which included additional photos of structures that CCHRC has assisting in building. He explained that CCHRC combined indigenous wisdom with Twenty-First century technology such as solar power. He shared his understanding that CCHRC has an established reputation in the circumpolar world of success. He stated that the center has approached net-zero in the homes that it has built in Interior Alaska, which is an example of a successful project.

8:55:14 AM

MR. HÉBERT advanced to slide 7, "Sustainable Northern Communities," which depicted a map of Alaska showing the locations of CCCHRC's housing efforts. He explained that this map shows just "some" of the center's efforts as it needs to be updated.

MR. HÉBERT moved to slide 8, "The Need," which read as follows [original punctuation provided]:

32.5% of the housing stock is considered in need of major repair or falling apart.
74.4 % of households are considered drafty.
21.8% of households are unable to maintain 70 F on cold days in the winter.
37.4% of households reported having mold or mildew in the home.

Fuel oil prices reach as high as $10/gallon.
55.9% of households have income less than $20,000.
Arctic is changing, 184 Alaskan communities threatened by erosion
Natural disasters are becoming more frequent

MR. HÉBERT directed attention to a photo on slide 8 of a young girl showing the photographer the condition of her home, which he said was among community homes that were so structurally compromised that "you could push a number two pencil right through the grey beam." He expressed that prioritization can be extremely difficult in these situations because needs are high, and resources are limited.

MR. HÉBERT continued to slide 9, "Sustainable Northern Communities; INNOVATIVE COLABORATIVE HOUSING DESIGN," which depicted photographic examples of some of CCHRC's prototype work in collaboration with rural Alaskans. He said that this work speaks to the kind of success that is possible with creativity and collaboration. Each photo included a caption, which read as follows [original punctuation provided]:

Anaktuvuk Pass Prototype
Average house: 1400 gal/yr - 5300 ltrs
Prototype house: 160 gal/yr – 600 ltrs

Atmautluak Prototype
Average house: 1200 gal/yr - 4600 ltrs
Prototype house: 120 gal/yr – 450 ltrs

Quinhagak Prototype
Average house: 1000 gal/yr – 3800 ltrs
Prototype house: 150 gal /yr – 600 ltrs

North Slope
Average house: 900 gal/yr – 3400 ltrs Prototype house: 132 gal/yr – 500 ltrs

MR. HÉBERT remarked that the indoor air quality and the health of the individuals living in these houses is "as important if not more important" than the energy efficiency of the home itself. He noted that the Atmautluak prototype seen on the slide was a standalone building and not on the sanitation grid, and to hook it up to the water and sewer system was much more efficient than implementing a standalone sewage treatment plant for just the prototype house. He added that the house was so energy efficient that the small wind generator behind the house could heat the house in the winter with an electric hot water heater.

8:58:42 AM

REPRESENTATIVE ZULKOSKY remarked it was appropriate to highlight the infrastructure needs and conditions experienced throughout rural Alaska. She asked Mr. Hébert for a sense of what the annual energy cost might be to heat an inefficient home.

MR. HÉBERT responded that it was a matter of doing the math on the cost of fuel oil and the average house size in the region. He stated that in Representative Zulkosky's region, District 38, this figure would be 1,200 of gallons of fuel per year for an average home. At six dollars per gallon, he continued, this would make the average cost around $10,000 per year to heat a home. He added that the cost is pretty sobering and that Alaska, despite its wealth, experiences similar conditions to Africa. He echoed that there is a necessity to find innovative ways to address these problems.

9:01:17 AM

REPRESENTATIVE FIELDS shared his understanding based on the presentation that a house in Anaktuvuk Pass consuming 1,400 gallons of fuel per year could cut its fuel consumption by almost 90 percent with a more efficient house, and there could be opportunities for weatherization investments that could yield a return if there was such a program to accomplish this. He asked Mr. Hébert whether he would agree that weatherization investments could yield a good return.

MR. HÉBERT replied absolutely. He shared his understanding that the quality of work in the weatherization has been remarkable, but resources have been limited. He noted that if there is not enough funding to correctly implement weatherization, then more problems could be created.

REPRESENTATIVE FIELDS explained that he brought this point up because there is an upcoming debate in a legislative committee regarding the proposal of a Green Bank, and one of the main points of contention is whether a certain amount of investment in "PC" communities in rural Alaska is required. He opined that Mr. Hébert's presentation makes a compelling case that there is no tradeoff, and that there would be a high return.

MR. HÉBERT responded that energy efficient healthy homes are an investment one need not keep making.

9:04:06 AM

MR. HÉBERT continued his presentation on slide 10, "Newtok," and showed a picture of the village of Newtok that had to move to Mertarvik due to unstable conditions. He said that this is the first occurrence of a village moving due to instability and climate change. He explained that the ground underneath Newtok was being washed away due to poor weather and storms.

MR. HÉBERT proceeded to slide 11, "Newtok; Mertarvik" which showed drawn examples of structures in both communities. He then advanced to slide 12, which included a photo of equipment with which to move a house. He explained that the equipment is very stiff and allows for the structures to be moved.

MR. HÉBERT advanced to slide 13, "PASS- Portable Alternative Sanitation System," and explained that the photo included on the slide depicts an early iteration of a stand-alone system that is proving to be a successful option. He shared that this system was installed for the first time in a home in Mertarvik and is being installed in more homes in Mertarvik. It does not require a hookup to a water and sewer infrastructure, he continued, and although it is not the most ideal system, it functions and helps improve health standards.

MR. HÉBERT continued to slide 14, "PASS- Portable Alternative Sanitation System," which depicted an image showing how PASS works.

MR. HÉBERT moved on to slide 15, "PASS- Portable Alternative Sanitation System," which included photographs of what he deemed as "kind of a vented honey bucket" but claimed is a more healthful system than a honey bucket and also provides water for handwashing. He noted that a benefit of this system is the fan positioned above the toilet, which provides continual

ventilation and can help improve indoor air quality in the homes.

MR. HÉBERT moved on to slide 16, "Mini-PASS Handwashing Cabinet," which included a photo of a system that brings fresh air into the house while incorporating warm air into the fresh air stream. He said that Mertarvik has these systems in place. He then moved on to slide 17, "BrHEAThe- Warm and healthy air," which showed an additional image of a system in place in Mertarvik.

9:09:44 AM

REPRESENTATIVE PRAX asked Mr. Hébert whether the systems could be maintained by individuals in the village were something to go wrong.

MR. HÉBERT replied yes, they are simple systems that just require routine maintenance such as changing the filters once a year. He added that the system has been well vetted, and individuals are comfortable with it.

REPRESENTATIVE PRAX asked Mr. Hébert whether there was enough training to maintain proficiency should something go wrong with the systems.

MR. HÉBERT replied that local training is important in all systems in operations of a home or building. He explained that the idea was to simplify them so they could keep up with maintenance. This would also be a way to keep the money localized, he added. He continued that the parts are lightweight and units that need maintenance could even be shipped out on a plane if required.

9:12:42 AM

MR. HÉBERT continued by showing more photos of housing in Mertarvik on slides 18 and 19. He then proceeded to slide 20, "On Site water and wastewater," and explained that in the community depicted that is adjacent to the the University of Alaska Fairbanks (UAF) campus, the water was installed both inside and outside of the home: an insulated tank outside of the home and an uninsulated tank inside the home for water delivery purposes. He directed attention to the sewage treatment plant seen in the photo, outside of the building, and shared that it is DEC approved for surface discharge. He relayed that there would need to be training to maintain these systems, but

expressed his certainty that the individuals who are responsible for utility system maintenance in rural communities would be able to learn how to maintain these systems as well.

MR. HÉBERT proceeded to slide 21, "Sustainable Northern Communities; A HOLISTIC APPROACH," and shared that a big part of the success of Alaska and "finding our way" is to begin with the people of Alaska as the greatest resource. He expressed that "if we work together, this really can be done." He stated that approaching the situation in an intrusive way does not allow for a full understanding of the compromised nature of the housing. It is inefficient to attempt to input a "several hundred thousand dollar per home" water and sewer system into homes in which a toilet is not mountable due to the structural instability of the home.

MR. HÉBERT advanced to slide 22, "Sustainable Northern Communities; A HOLISTIC APPROACH; SECURITY, RESILIENCY, SUSTAINABILITY," and stated the importance of acknowledging the challenges that are experienced by rural communities. In 2017, he said, there were 20 Alaska communities that needed to be relocated within 10 years, according to Federal Emergency Management Agency (FEMA). He noted that in the latest Denali Commission Report, there are now 29 communities that need to be relocated, and another 158 that are threatened to a lesser degree by erosion and flooding. He expressed that the resources are simply not available to be throwing money at these issues without also making progress. He concluded that it's going to take collaboration towards the goal of a better future for the people of Alaska.

9:17:56 AM

REPRESENTATIVE TARR asked Mr. Hébert whether there could be a policy that requires new construction and whether the legislature should consider a policy directive that would require a certain percentage of Alaska's energy portfolio to come from renewables.

MR. HÉBERT replied yes, and shared that Alaska State Homebuilders has been working on getting a state energy and building code. He said that the Alaska Housing Finance Corporation has also been working on this for years, and it even requires these energy standards for anything that it finances. He emphasized that it is important to understand that any new regulations that are implemented need to make economic sense as well. He gave the example of weatherization in Alaska, and said

that although the return for individuals living in these newly weatherized houses is immediate, it is important to also consider the long-term return for improvement of communities.

9:20:14 AM

BOB TSIGONIS, Founder, Lifewater Engineering Company, gave a PowerPoint presentation, entitled "Sanitation in rural and remote Alaska," during the overall presentation on Sanitation in Rural Alaska. He explained that he has been involved with water and wastewater treatment in Alaska since 1974 during the construction of the Trans-Alaska pipeline.

MR. TSIGONIS began on slide 2 of his presentation, which included photos of piped water and sewage systems in Alaska, a type of system that he claimed is considered to be the "gold standard" in terms of convenience in public health. Village safe water and the Alaska Native Health Consortium have brought systems to as many villages as they can, he continued.

MR. TSIGONIS advanced to slide 3, which included photos of broken and malfunctioning pipe systems. He said that, unfortunately, pipe systems are expensive to construct and maintain, but there are alternatives to pipe systems that are being implemented in various locations in and around rural Alaska. In 1998, he continued, he founded Lifewater Engineering Company as a consulting company. At that time, designing a residential sewage system for permafrost meant little more than specifying a mounded leachfield to achieve the required six-foot separation from the bottom of the leachfield to the top of the permafrost.

MR. TSIGONIS continued on slide 4, "CRITERIA," and explained that a year later in 1999, a former colleague asked if he could design a sewage system for his house on permafrost. The slide listed this colleague's criteria, which read as follows [original punctuation provided]:

- No buried tanks or leachfield
- Approved by ADEC
- Easy to operate & maintain
- Spare parts & support available in Fairbanks
- Not too expensive
- Work above ground at -60°F

MR. TSIGONIS shared that he completed a design over a period of four months and discovered that in order to be cost-effective

for his client, Mr. Tsigonis would have to build the system himself. He said that it was at this point that Lifewater Engineering then transitioned from a consulting to a manufacturing company. He relayed that a second person soon heard about this new residential sewage treatment plant and told Mr. Tsigonis that he wanted a plant as well. He said that the temperature did drop to -60°F that winter, and was at -50°F for two weeks, and his two sewage treatment plants made it through the winter with no issues. He stated that the next residential sewage treatment plant was purchased by Luke Hopkins, as seen on slide 5. He told Chair Hopkins, "Yours is a family of early acceptors," and he thanked Chair Hopkins for his contribution to the success of his company.

9:24:12 AM

MR. TSIGONIS continued on slide 6, "Wastewater Treatment Plants," and shared that Lifewater Engineering has now manufactured 338 systems.

MR. TSIGONIS proceeded to slide 7, "2014," and expressed that one of the most fulfilling projects in his life has been working with Alaska Native Tribal Health Consortium (ANTHC), Cold Climate Housing Research Center (CCHRC), and two other companies to develop, test, and deploy what he said has been determined a portable alternative sanitation system (PASS). He noted that the other private companies are Camp Water Industries and Silverline, both from Delta Junction, Alaska. He shared his understanding that even before Lifewater Engineering began working with these companies, every team member was familiar with the unsanitary conditions often found in rural communities that did not have piped water sewage systems. Every team member was already working to alleviate those conditions, he said.

MR. TSIGONIS continued on slide 8, "Needed," and explained that what brought the companies together were three things, which read on the slide as follows [original punctuation provided]:

- Hygienic way to wash hands in running water
- Sanitary way to collect & dispose of human waste
- Way to ventilate homes

MR. TSIGONIS advanced to slide 9, which depicted a bubble chart suggesting collaboration between various organizations, and he added that his efforts in the development of PASS began before the outbreak of COVID-19, but became especially relevant after the outbreak. He recognized the staff of ANTHC, in particular

John Warren, Jackie Schaeffer, and Mia Heavener, who led the charge to develop PASS. He explained that each organization covered its own brainstorming, design, and prototyping costs, which meant that no contract needed to be negotiated and no payments needed to be made, apart from the units that were sent out to the villages for testing and use.

MR. TSIGONIS proceeded to slide 10, which depicted two flyers for PASS. He explained that early in the process, Lifewater began building prototypes for water-less toilets, and CampWater Industries (CWI) began building prototypes for drinking water systems for PASS and handwashing stations for a Mini-PASS.

9:28:56 AM

CHAIR HOPKINS asked Mr. Tsigonis how training, maintenance, and up-keep works in far-flung areas of Alaska.

MR. TSIGONIS replied that there are two types of technology for Alaska wastewater treatment systems: residential/village level, which is simplistic and has readily available materials, and commercial, which is a high quality system. He shared that the implementation is always the toughest part in rural Alaska, and requires a lot of work cross-culturally and educationally. He said that Lifewater has worked with several housing authorities, which have employees who educate homeowners on the systems at the same time as they maintain and monitor the systems. He added that Lifewater services over 100 systems in the Fairbanks and North Pole, Alaska, area twice a year and welcome the opportunity to work with organizations to come up with creative ways to ensure the systems get the necessary maintenance. He emphasized that maintenance is very simple, but individuals simply need to be encouraged to do it.

9:32:37 AM

DAVID BEVERIDGE, Interim Senior Director, Division of Environmental Health and Engineering, Alaska Native Tribal Health Consortium, discussed sanitation in rural Alaska during the overall presentation on Sanitation in Rural Alaska, and categorized many rural communities as unserved and underserved. He began by speaking to the high level of collaboration that takes place across Alaska. He agreed that there is no one entity which has all the answers, so it's really important to work together. He put forth it was difficult for some individuals in villages to comply with COVID-19 mitigations because they couldn’t even properly wash their hands. He

relayed that Alaska Native individuals consistently represented about 27 percent of hospitalizations throughout the pandemic, and almost 37 percent of the deaths related to COVID-19 were Alaska Natives and Native Americans.

MR. BEVERIDGE continued by elaborating on the PASS unit. He shared that the idea for PASS started at ANTHC, and the board of directors funded an initiative that provided the funding to develop the project. He said that the PASS unit is now installed within around 80 homes in Alaska and, mentioning the relocation of Mertarvik, noted that the PASS unit is what is allowing the individuals in the village to access hygiene needs. He shared that ANTHC was provided $2.2 million from private non-profit donations to fund 100 Mini-PASS units, which he said they are actively working on implementing.

MR. BEVERIDGE proceeded to discuss the interplay of cost and energy, and shared that ANTHC discovered that energy made up about 40 percent of the cost of operating a water and sewer system. He noted that the water must be heated so that it doesn't freeze and must be kept moving so that it is recirculated for the community, which requires pumps, electricity, and typically, diesel fuel. He noted that the two biggest ways that ANTHC has discovered to cut costs is to make simple energy efficiency improvements, and conduct larger projects in developing renewable energy infrastructure, and estimated that this has resulted in an over $20 million in savings to date. He added that the current estimate is that communities are saving an average of $3 million per year in energy costs through the program. He pointed out that the project also creates local jobs, so in addition to saving the community money, it also circulates additional funds into the economy through wages.

9:39:32 AM

MR. BEVERIDGE continued by remarking that in many cases, ANTHC has been able "to heat up a heat recovery system" to the power-plant in the community. He gave an example of one community where this was successfully implemented and the effort reduced the water plant heating fuel usage by 90 per with a savings of 8,800 gallons per year, and over $40,000 in savings for the community. Additionally, he continued, in some communities that have turbines to generate or supplement electricity, the turbines generate such an excess of electricity when running at full speed that the excess can't be taken advantage of because a sufficiently advanced battery system doesn't yet exist.

MR. BEVERIDGE added that a number of years ago ANTHC founded the Alaska Rural Utility Collaborative, which comprises about 27 communities managed by ANTHC. He said that this gives ANTHC the opportunity to try new approaches to utility management and incorporate best practices. A few years ago, he said, ANTHC started a project with the Northwest Borough called the Community Utility Assistance Program, which helped provide reduced costs. Some of the funding for this program pays for fuel, training, and salaries, he said, and the water and sewer costs in those communities were reduced by two thirds due to the efforts of the program.

MR. BEVERIDGE explained that ANTHC is trying to protect infrastructure that is in rural Alaska, and there are lots of communities that are threatened due to environmental factors, such as flooding and permafrost. He said some of these situations are deemed "slow-moving disasters" because it is the result of a slow failure in a system that has been put in place to keep some infrastructure in place called thermosyphons, and he said that these are not functioning like they used to due to climate change. He explained that ANTHC is developing refrigerated columns to strap on to the thermosyphons, and using solar energy to activate the system.

MR. BEVERIDGE circled back to the earlier conversation about funding and said that the list of needs that is maintained for rural Alaska consists of $2.2 billion of need. Of that, about $1.5 billion is needed to take underserved communities to a fully served status. Other needs include aging infrastructure that needs to be updated. He noted that the state provided funding for infrastructure protection in the recent past, which he said was a quick way to get money out to the necessary communities. He estimated that investments like this could result in a significant savings by prolonging the need to replace a system in the future. He explained that ANTHC is collaborating with partners in an attempt to remove some barriers to receiving more federal funding, which includes limits on how much funding can be provided per home. He said that when a community has only 600 or 700 residents and is reliant on a small water source, oftentimes a new water source needs to be identified that can meet the needs of a fully piped community. Waste solutions also need to be identified, he continued, for generation of wastewater that will be significantly higher than what the community sees currently. Systems in existence for funding don't recognize these factors,

he said, and for this reason, removing barriers for funding is important.

9:49:18 AM

REPRESENTATIVE ZULKOSKY asked Mr. Beveridge to remind the committee of the definition of and statistics on unserved and underserved communities.

MR. BEVERIDGE replied that there are 32 communities unserved, and in these communities, fewer than 55 percent of the homes are "hooked up." There are 17 communities that are underserved; some of these have flush tank systems that do not achieve the same level of public health benefits, and there are "communities that have less than 85 percent of the home" covered. He said that this means that more than 20 percent of the homes may not have service. He explained that there are some communities that have been piped, but there are clusters of homes within the community that do not have pipes, and these would also be referred to as underserved.

REPRESENTATIVE ZULKOSKY asked Mr. Beveridge what type of health research ANTHC is conducting on past systems' impact on "water washed diseases." This would allow for broader acceptance on the federal side to implement these systems, he claimed.

MR. BEVERIDGE replied that the research department of ANTHC is working to look at the impact of the past.

REPRESENTATIVE ZULKOSKY asked Mr. Beveridge whether he anticipates that research being made available as the team at ANTHC assesses the impact.

MR. BEVERIDGE responded yes.

REPRESENTATIVE ZULKOSKY expressed that the lack of sanitation in one of the wealthiest states seems to her to be one of the most staggering and egregious inequities. She noted that the COVID-19 pandemic highlighted to another degree the significant disparity for sanitation facilities in Alaska homes. She opined that it seems like an appropriate time to make an investment in sanitation.

9:52:35 AM

REPRESENTATIVE PRAX asked Mr. Beveridge how ANTHC was interfacing with individual villages and shared his understanding that a "cookie-cutter approach" doesn't work.

MR. BEVERIDGE expressed agreement that the "cookie-cutter" approach doesn't work in this situation. He noted that some federally implemented policies that work in other states don't work in Alaska. He said that attempting to apply systems that work in the "Lower 48" simply does not work in Alaska; there is a huge disparity in cost, and construction windows are much smaller in Alaska. He explained that ANTHC works closely with communities and partners to identify the types of projects that are the best solutions for those communities. He emphasized that the solutions are specified for each community and are not a "cookie-cutter" approach.

9:56:02 AM

ADJOURNMENT

There being no further business before the committee, the joint meeting of the House Special Committee on Arctic Policy, Economic Development, and Tourism and the House Special Committee on Tribal Affairs was adjourned at 9:56 a.m.