

1/26/12 8:36 Quarter Deck

Present at start:

Mike Black	Susanne Fleek	Greg Magee	Tim Thomas
Carrie Bohan	Bill Griffith	John Nichols	Dennis Wagner
Steve Bolan	Rachelle Hill	Nancy Nix	John Warren
Deb Caldera	Steve Konkel	Denman Ondelacy	Dan White
Steve Colt	Brian Lefferts	Alan Parkinson	Bob White
Nancy Davidian	Eric Lespin	Doug Poage	Emily Menard
Tasha Deardorff	Ed Lohr	Cheryl Rosa	

C. Rosa greeted the group and shared the meeting background. The 2012 USARC Goals Report gives priorities based on input from residents, public, and researchers. One of the five goals is Arctic Human Health, and clean water and sewer is clearly connected to improved health outcomes. As part of the research process, USARC, along with the CDC, convened last year's workshop on water and sewer innovations in rural Alaska looking at potential research strategies to improve residents' health through efficient and effective water and sewer (W&S) systems. Last year was a broad introduction to the issue. This workshop is a focused follow-up.

T. Hennessy thanked Cheryl and said they are hoping for new relationships and new ideas.

Presentation 1: Bill Griffith

Overall Capital Funding Needs for Water and Sanitation in Alaska

Started 8:45

Historical project funding needs, projections, status report.

30 years ago, 25% of homes had running water and flush toilets. Today, 75% have indoor plumbing. However, our centralized approach has been very energy-intensive, with large quantities of water heated during storage and distribution and a household sewage collection process that also requires heat.

We have capital project needs in 3 categories. Benefits/minor needs (\$200M) go unmet because the other two dominate. First service needs (\$300M) is very rough estimate and probably low. Necessary upgrade needs (\$410M) are growing larger all the time.

Of 35,000 rural homes, 83% are served and 17% (about 6,000) are not. 30% of unserved homes are in served communities. Of the 6,000, we only have funding to hook up 1,000, and over 2,000 are considered unserviceable because there's no sustainable way to serve them.

We've made progress on first service need, but it will likely increase again in the future. Upgrade needs are going up with no signs of decrease. With failing pipes and water tanks, water plants not meeting regulations, etc, the need will increase to above \$500M.

The funding situation is getting worse. Although our Congressional delegation had significant influence from 1990-2004, funding has been on the decline since, getting down to \$65M in 2012, well under half of what we got 7 years ago. Funding coming through the State has seen the greatest decrease. Decreasing funding and increasing needs have created an estimated 2013 gap between funding and unmet needs of \$638M, more than double the 2006 gap of \$316M.

Calculating how long it would take to serve all the unserved homes is a paper exercise because

our current estimate is low by 200-300%, we don't have funding for in-depth planning, and we don't know the future of our funding, but we do know it's declining. However, if all factors remain steady and unserviceable homes are served using the same cost per home, it will take 19 years (2031) to serve all homes in Alaska with centralized systems.

Another problem is the cost of water and sewer user fees as a percentage of median household income (MHI). The EPA-recommended sustainability threshold is 5%, and many Alaskan homes are above that. In the lower 48, the average is just 1%.

The bottom line is that existing systems are becoming unaffordable to maintain and we don't have the funding to serve the remaining 6,000 homes and make other essential improvements. We need innovation now to prevent health problems. Innovation might not involve brand-new technologies; it might mean applying our existing technology in new ways.

Panel 1: Commissioner Larry Hartig, Susanne Fleek, Dennis Wagner, Tasha Deardorff, Denman Ondelacy

Q1 to D. Ondelacy: What should the overall objectives be when trying to promote in-home water and sanitation service for optimal public health benefit in Alaska?

I've served for 20 years across the US and in Samoa. The need for sanitation is everywhere, but is certainly most dire here in Alaska. The IHS approach includes these objectives:

1. Ensure enough water and adequate facilities to ensure public health.
The thought of "minimal" public health disturbed me because we are setting the bar low. But we are compelled to do so, considering the circumstances. Those who have been to the villages understand the reality as we face funding decreases and challenges related to capacity building or lack of capacity.
2. Build systems that can be maintained by the communities and are technologically viable and affordable.
3. Ensure that the community wants and accepts the systems and the systems are culturally appropriate. In Kipnuk, for example, systems to allow them to shower and do laundry in their homes aren't things they have decided that they need. They use steam/saunas and they prefer to drink rainwater or ice melt water, so trying to define what they want from our end is not our job. It depends on what they want, to a large extent.
4. Meet basic needs such as washing and bathing. This is complicated by what the community wants.
5. Provide waste disposal.

Q2 to D. Wagner: What policy changes are needed to achieve these objectives?

Many of the policies affecting what we do are based on national guidelines and regulations. When we talk about what Alaska's communities need, we're trying to fit in the box of national regulations, but we need to acknowledge that unserved needs strategies for villages may be different than what would work in Anchorage. Regulations need to be flexible; Anchorage regulations don't fit Kipnuk. We need to operate and maintain safely without being over-regulated.

Have there been attempts to change this in the past?

EPA and the State have discussed it in the past, but it's hard to do. You loosen in one area and end up with this momentum nationally: If Alaska can do it, why can't the Appalachian area do it,

for example? It's very hard to get regulations changed. But there is room for change.

Other panel members' thoughts?

S. Fleek:

Dennis made an important point. Funding is part of the pressure, but we also hear from communities that we need to make culture/community-appropriate systems, sustainable for the long term. It's hard to go outside the box when regulations come from the Washington, D.C., level. When Senator Begich came to office, he wanted to look at regulations restricting agencies from the flexibility they need to implement culturally appropriate infrastructure in rural Alaska of any type – water, housing, education, etc. Rural Alaska really is different. Senator Begich even has a term for it: “Extreme Rural.” Nothing else like it in the US. We've had to educate high-level policymakers about what rural Alaska really looks like. Four agencies' bosses came to Bethel/Hooper Bay in 2009 to see how agencies need to work together to invest in community-wide sustainable infrastructure. No sense building a house that, because of USDA regulations, you can't hook up to W&S. We also need to look at cross-agency regulatory conflicts.

We've asked the Denali Commission to do a survey of agencies, and it's close to final. Senator Begich and the delegation want to take it to Administration, see what we can tackle administratively, and do the rest legislatively. Especially with the funding reality, we need flexibility, loosened regulations, and to build more community-appropriate systems.

L. Hartig:

From a State perspective, this will be a tough nut to crack. It requires national changes to CWA, which realistically won't happen any time soon.

We need to consider not only whether requirements mean spending money without truly addressing health problems, but whether they mean we're getting to other problems.

The Department of Justice on behalf of the PA sued Unalaska last year to force them to secondary treatment. Their waiver is not any different than that of 80 other communities in the State that lack secondary treatment now. Unalaska may be on TV all the time and there's a perception that they have more money than other communities as a result, but in reality, they are trying to respond to drinking water rules, other necessary upgrades, other needs like a landfill, etc. Forcing them to build a \$34M treatment plant means other priorities are wiped off. That secondary treatment requirement is national. If Alaska says, “We are different,” everyone else says, “Us too!” The waiver has been around for over 30 years, and the legal underpinnings are very weak (does EPA even have authority?).

Don't forget that not just the smaller communities are affected. It can be Unalaska, Cordova, and larger, maybe non-Native, communities around the state. It's a broader issue than rural Alaska, and we cannot solve it piecemeal.

It'll probably be status quo for awhile, where people look the other way when it comes to rural communities. We may not want to draw attention to unsolvable problems.

Drinking water rules are adding complexity and cost to systems around the state, but are we really attacking the public health needs?

Thoughts from the floor?

T. Hennessy:

Is the panel's thinking unified? Is it our objective to provide water service to every home? Is that a written policy/universal approach? Non-recipients are consigned to a lower health status.

- T. Deardorff: The overall intent is to provide service to all. As agencies, we need to see it

will be maintained when we put it out there, which can be a big challenge. We also look at the cost of O&M. At RD, we would like to provide W&S to every home. Everyone needs it.

- D. Wagner: In an ideal world, all would have W&S, but in reality, they have to be able to afford it. With O&M funding, systems have to be sustainable on their own.
- S. Fleek: I agree, we can't put a burden on an individual that they can't afford. We look at community need and individual need. If individuals can't afford it, it's not a burden to place on them until we find another solution. The political reality for government is that we don't have money and won't any time soon.
- D. Ondelacy: It's the reality all over. On the Navajo reservation, isolated homes have cisterns. It's the largest tribe with a lot of resources, but it can't afford to serve a home 5 miles from a water line. They have acceptance and flexibility in their policy that this is what they can do now.

D. White:

It's critical that treated water is available. People will say I don't want it, but people in every community will need it. Everywhere I've seen, fire protection is provided by the water system. We need to think about ancillary effects. A community with in-home water only can't fight a fire with rainwater off the roof. It's something to consider as we decentralize.

- D. Ondelacy: In policy and practice, IHS doesn't design or fund projects for fire protection, but to meet basic sanitation. Of course if the opportunity avails itself, sure, but we have to focus limited resources on basic needs. We end up providing a lower, but accepted, level of service.
- L. Hartig: I haven't heard that come up in rural Alaska. The main objective is the health issue.

Brian L:

It doesn't make sense to put a W&S system where operation and maintenance of the system is unaffordable. Are agencies discussing how to make O&M more affordable? What are options to reduce O&M costs?

- D. Wagner: We're looking at energy costs, the driving force behind high costs. In Selawik, we replaced existing boilers with more efficient ones. We implemented waste heat in Minto last summer and haven't turned boilers on all year in -40. Alternative energy is big.
- D. Ondelacy: I've never encountered a situation with as much coordination/consultation between agencies as in Alaska, particularly with this level of State support. Much success results from that.

Q3 to S. Fleek: What kind of information or arguments we're not currently using might be provided to people at the Federal Delegation or State Legislative level to support funding requests?

The federal funding decline really started in 2006. We arrived in 2009 facing the worst recession since the Great Depression and a lot of pressure because of the \$14T national debt. The government went through a lot of money on both the tax and spending sides very quickly, leaving the US in a deep hole. The backlash led to our current ban on earmarks, a tool our delegation used well for many years, and we don't expect the financial outlook to change any

time soon. With the government at a stalemate about how we equitably tackle the national debt and annual deficit, Senator Begich wants to see a balance between cuts and taxes. We hope to see more bipartisanship after election.

So, we need to ask, how do we spend the money smarter? We need to make the case to our Senate colleagues that we use our money wisely. Staff on funding committees travel to Alaska and have examples of Alaska not using money wisely and communities not using systems because they're not affordable. A small number of examples last a long time in their memories, especially when they're being pressured by 100 senators. We also have to show that Alaska is unique and faces conditions we don't see elsewhere in the US.

One key federal funding piece is getting in the President's budget. If it's not in the Presidential budget and we ask for an increase, staff will see it as an earmark. We've run into this with the RAVG program and Alaska Native education program – we need a programmatic increase, but our request is seen as an earmark. The second piece is to be sure a project meets community desires and needs, and we can say this will address what they want for the long term.

The entire delegation works closely and shares the same perspective on rural Alaska's needs. When Senator Begich sees a request for something in a community, first he'll ask what is appropriate and wanted. Second, he'll ask if it works community-wide with the health clinic, W&S system, transport system, houses being built, etc., because all the pieces work together. Agencies have a lot of pressure on them. Innovation is key, especially to address costs for energy, transport, and design. It gives us something persuasive to share with funding committees, showing that we will use money in new ways to make systems affordable.

How can we use good economic news in Alaska to bring new sources to rural communities? With the development in Arctic offshore oil and gas, can we pull that stream and put some back into our State and rural communities? Senator Begich introduced a bill to take 37.5% of revenues and bring them back to Alaska with a percent each to the State, local communities, and Tribes.

Other panel members' thoughts?

D. Ondelacy:

W&S is a preventative approach. We prevent disease, we save money in the end. When visitors come, don't just take a day but spend a few nights, using the honeybucket, using the shared wash bowl, getting water a few miles away by snowmachine. Seeing conditions speaks volumes.

D. Wagner:

We need to celebrate and show our successes, making legislators aware. Otherwise, they'll only remember things like when I took the OMB Examiner to Brevig for a new system launch and people were hauling ice to drink (“don't like the taste of treated water”).

T. Deardorff:

Across the nation, people face aging infrastructure. We need to showcase why we are different, why we need the money to replace our aging systems. How do we do that?

S. Fleek:

It really is amazing to take them out there. They are very surprised. You don't get it until you're there – I sure wish we could get them to hunker down for several days. Even a day makes a difference. I haven't had a Cabinet member yet not be really, truly moved. Secretary Sebelius came and ended up giving an all-staff presentation to HHS. We also need to get visitors to come back and to hold them accountable.

Q4 to T. Deardorff: What support is available and what obstacles might be encountered when attempting to fund pilot projects of new concepts?

If it's not a proven technology, it's questionable to spend the money. What if it does not work? The dire condition is back.

We need to see proven technology in community use, either here or in the lower 48, so we can be sure the dire sanitation condition is addressed for long term. We don't want to go back in a year.

L. Hartig:

Yes, the State wants to move forward with technology we know works somewhere, or conceptually looks like it would work in Alaska. The powers that be don't want to fund things that could fail. State agencies don't do R&D; they have no budget for that. Most is done by the University. The money in the Governor's budget this year is seed money. We're hoping to leverage industry, because if they come up with technology that works and has a market, they could mass produce, bringing costs down. But they need to put their own skin in the game to get there. Pilot projects or a test center at the University like with energy pilot projects could work.

Follow-up Q: How easy is it to put a pilot project in a village? Do they accept them?

D. Wagner:

Don't try a pilot on a community as a whole, work with the community and test it in 4-5 homes. Find problems before spending millions. Unserved residents tend to be willing to work with us.

L. Hartig:

That's what we're contemplating on a 10-year horizon. Legislators want to know, how are we going to serve the remaining homes? Harder-to-serve homes, areas struggling with cost, and places needing alternative technologies will take time to explore. The political reality is that either we wait a long time as costs build or we explore.

Thoughts from the floor?

S. Konkel:

Innovation is interesting. We wouldn't want to experiment in a single community and fail, because everyone will know. A fluoride taste issue in one community becomes general knowledge. What if problems shared between villages could be solved in a cooperative framework? Multiple communities could share someone who can fix WTPs? Should piloting be designed to get people working together?

D. Ondelacy:

The ARUC program is an excellent example of this. It's not about different technology; it's a combined effort led by ANTHC, a paradigm shift that has gained wide attention nationally. IHS provided the seed money to start. We had questions about authority to spend money on O&M, but had success convincing high levels that ARUC is an authorized ANTHC activity. Convincing others of its validity paves the way for us to support programs like ARUC in the future.

Q5 to L. Hartig: If a program similar to Power Cost Equalization (PCE) could be established for W&S utilities, what State agency would be best suited to advocate for funds from the legislature and administer the program? How could something like this get started?

This session, we're seeing a lot of interest in village safe water from the Bush Caucus and its Chair Reggie Joule, Senator Hoffman, Senator Olson, the House Finance Committee, Representative Edgmon, and others. Discussions should start with the Bush Caucus. What are the needs? We have needs related to new systems and aging systems. In Bethel, a school had

problems with frozen pipes, and it's happening elsewhere in Southwest Alaska. The Legislature is paying attention to maintaining aging systems. This presents an opportunity for discussion, keeping other realities in mind – declining revenue, pressure to increase oil production, more competition for less funding, etc. I'm encouraging more holistic. Legislators are inclined to do more this year knowing this could be one of their last opportunities to get needs met in their communities. Also, it's an election year for all but Senator Egan in Juneau, so legislators need to bring things home. Reapportionment means that legislators who formerly had no ANTHC/VSW communities now have them. Still, there will have to be a compromise with urban legislators and the Governor. There's a lot of discussion about increased costs and decreased funding everywhere outside of the main urban centers, so non-Native communities also have problems that come into play.

Regarding what agency, our agency has background on the technical side working in communities. The Department of Commerce, AEA, and others have experience too. One issue out there would be the different categories of maintenance needs. One community may struggle with its school, power plant, and W&S system; more money won't stop the struggle, and the community needs Commerce to help with a holistic look. Another community may need a surge approach with a system upgrade that could knock out its maintenance problems fast and get it back on track. Our agency would do that, and we may need to expand the RMW program.

Overall, declines in funding and maintenance happen over time rather than presenting a crisis moment. Start with Bush Caucus and contact key legislators down there, recognizing that a cap in budget will be negotiated.

Thoughts from the floor?

B. White:

Is anyone putting forward a program like PCE?

- L. Hartig: No. I've discussed its importance, but they are trying to figure out priorities when there are so many unmet needs. Senator Kookesh does have a bill to form a committee to look into issues, but most of the issues are already being considered.
- D. Wagner: This comes up often in EPA meetings, but we can't lobby the Legislature. Traction has to happen via lobbying at grassroots level from someone besides a federal or State agency.
- L. Hartig: Legislature plans to schedule a Bush Caucus info session with ANTHC, RD, and EPA. It's important to consider resources in informed way.

M. Black:

I worry about linking PCE to W&S systems in discussion. Most recognize PCE to be flawed subsidy. It's based on cost: higher costs mean a higher subsidy. This doesn't motivate changes for residents and doesn't help businesses, so we still see a major business exodus. (C. Rosa asked: How would you change this?) It must be a performance-based subsidy with accountability to complete often-ignored maintenance and extend system longevity.

In the past, communities have benefited the most from catastrophic failures. When the system goes down, we replace it. This represents a lot of benefits, such as jobs. In our changed environment, we must do all we can to extend systems' service lives. We need to encourage proper O&M. In our energy program, we've discovered that a large percentage of O&M costs are unnecessary if you enhance efficiencies, including energy. For example, we use heat tape for many things, but not very efficiently, especially when tape heats pipes unnecessarily because operators or homeowners may not understand the overall system. A subsidy could influence

through education on operations and through accountability.

- L. Hartig: They like to build things, not fund O&M. But I agree fully with Mike. O&M extends system life, protecting the investment (proven by studies), and meets our main objective, protecting public health. I have suggested an incentive program requiring an approved O&M plan with schedule etc, and if they fulfill it they receive partial reimbursement.
- M. Black: We had a pilot program called LUMP in NWAB, a \$300K appropriation from Senator Al Adams. O&M of systems improved enormously via a subsidy based on meeting performance criteria. Checks were written by NWAB. Once done, it was forgotten. Unnecessarily! Nobody picked it up as model. We need to resurrect it.

Q6 to D. Wagner: Should O&M costs be a criterion for capital funding consideration?

Yes, as we've discussed throughout this process.

Thoughts from the floor?

D. Poage:

Canadians plan projects based on lifecycle cost. We only consider capital cost.

S. Fleek:

The rural/urban divide is very much there. "Why do we spend so much to build expensive systems in rural Alaska? What about Anchorage?" We have to talk about sustaining communities: economics, creating environments where people want and can afford to stay and businesses can thrive. Economics makes the case to large audience. The Bush Caucus is a minority in the Legislature, clawing for funds facing urban majority. It's the same in Congress.

C. Rosa:

The rural immigration issue is in most recent goals report. Steve Colt's paper was a source. This issue won't go away; things aren't getting cheaper in villages.

J. Warren:

5% MHI as threshold, but Bill showed many operating successfully above the threshold.

D. Wagner:

We developed the guideline with RCA, using 3% for water (EPA national guideline) with 2% added on. Those systems probably weren't above 5% when they were built 20-30 years ago, when fuel was \$1 instead of \$8. They're doing it, but it's not optimal.

Presentation 2: John Nichols

Operations and Maintenance (O&M) Incentives, Needs, and Subsidies

Started 10:35

My perspective on W&S comes from my background serving as Public Works Director for Dillingham, doing design/build for Western Alaska, handling tribal water and sewer in Idaho, and now, focusing on O&M for rural Alaska. I've learned painfully what to say and not say in a City Council meeting, discovered challenges I haven't expected, and worked in Idaho with one of best tribal O&M programs in the Pacific Northwest. The Idaho reservation taught me that O&M is one of biggest keys for W&S success. How do we maximize the health benefit we can give people with the available funding? How do we give people health, but also protect our massive investment in infrastructure?

ARUC is a full-service, nonprofit collaborative. We help set rates, bill customers, employ operators, enforce shutoffs for non-payers, and buy parts/pumps/fuel. We bill at rates set by the village. ANTHC has invested a lot of resources into developing ARUC because we know that engineering is preventative healthcare. It's far cheaper to keep people out of hospital than to treat symptoms of not having W&S.

The foundation of O&M is this: How do we take the system we just built and sustain it for future generations? We do it through three methods.

First is revenue, the basic building block and most fundamental need. Lack of revenue leads to deferred maintenance, a nice way of saying "not fixing things." This leads to emergencies, which require funding, and soon we see more failed systems. In other words, deferred maintenance destroys systems. Lack of revenue also causes operator hours/wages to be cut, causing turnover, and new operators don't know the systems. The Navajo Tribal Utility says the most important thing is to disconnect politics from management; a council member who needs to increase rates to save the utility commits political suicide. Fort Hall had an excellent O&M program. The tribe subsidized rates. When the USDA said rates need to go from \$6 to \$35, the tribe raised rates to only \$8 and all hell broke loose. Politics and utilities don't mix.

Second is long-term employees, because constant turnover precludes success. Less complex systems would be great, but the reality is that complicated systems are all over Alaska, and well trained operators decrease cost and increase system life. At ANTHC, we've seen that when our basic operator training is full every year, we don't see progress in O&M success. We end up with status quo at best: we have emergency avoidance, not efficiency or financial improvements.

Although coordination between managers and operators could greatly improve consistent O&M that extends system life, I can't think of a single community where the manager knows how the system is operated and operator knows the budget and how his actions influence it. This lack of knowledge prevents efficiency. If you don't know how much fuel a plant burns, you can't know if an energy efficiency project is worth it. Very few communities can state how much of the City's fuel use is at the WTP. Operators need to know that turning up the water temperature from 42 to 46 degrees could cost \$50K/year.

To succeed as a state, we need to improve efficiency using the three basic building blocks, and we need to tackle them in this order.

Discussion

M. Brubaker:

Between cost of living increases, decreased funding, and climate issues, this is the most difficult period W&S infrastructure communities have faced in recent history. We need greater cooperation between agencies cross-discipline – housing, infrastructure, W&S – because there may be broad failures in a community affecting boardwalks, bridge, homes, water, etc. In addition, climates are changing rapidly in vulnerable areas, such as with permafrost, and we need more rapid responses to ongoing surveillance. Even water operators have not been closely monitoring all parts of systems, so we see major erosion issues, line breaks, and going unnoticed. Regarding water sources, the systems we have designed today were based on certain environmental parameters and expectations. Some areas are seeing very rapid changes in surface water, turbidity, chemistry, river systems, algae blooms, water level changes, and sediment levels, creating new challenges for WTP operators and increasing the surveillance need.

J. Nichols:

If you have a system, make it last, because you won't get money for a new one. If there are

changes, it'll only get more complicated because regulations are getting more complex. Regarding M. Brubaker, one thing would be for VSW and ANTHC to work more closely with agencies like housing authorities, clinics, and school districts during their planning and construction to design their W&S system connections. They tend to hire consultants unfamiliar with how the core W&S system works, so they design things that become a huge maintenance headache. I want those connections to work. They may belong to a given entity, but if they freeze up, they become mine.

J. Warren:

We talk about how expensive these systems are to run, but the bigger question is, are they operated properly? Operators aren't trained on the cost of turning up the water temperature. In many cases where homeowners complain about freezing, the operators turn up the heat to forestall complaints, but the problem is in a three-foot arctic box.

D. White:

On the other hand, we saw an operator turn the system down too far to save money, and it ended up costing a lot more due to lower efficiency.

Panel 2: Bob White, John Nichols, Carrie Bohan, Mike Black, Ed Lohr, John Nickels

Q1 to Nickels: Are there additional challenges to O&M the panel is aware of?

RUBA does assessments. First, we see smaller challenges like no lists for critical spare parts, no inventory, no preventative maintenance plan, SNC listing, and regulatory compliance issues. But the other problem is buy-in. Communities with buy-in seem to take better care of the systems. Ones that don't are more dysfunctional. We see a loss of interest in management capacity when communities use regional management. When policymaking boards for communities (tribal and city councils) lose interest in utility management, they lose interest in managing budgets, taxes, etc.

Other panel members' thoughts?

E. Lohr:

Communities I've seen that run it like a business are far more successful than run it as a program. One challenge is to treat it as a business.

Thoughts from the floor?

M. Brubaker:

Communities are so different. We may have a few standard ways utilities around Alaska are run. Are there model communities that highlight how locally/regionally run systems work well?

- J. Nichols: Savoonga is an ARUC community with huge buy-in. They have a vacuum system with a lot of disadvantages, but they are very successful and operate in the black.
- M. Black: It's difficult to generalize about rural Alaska. Some communities are more than capable and they problem-solve. Tanana was using too much energy, bankrupting the school system. The City Manager got one of the first renewable energy grants out of D.C. Successful communities usually have managers and public works directors solving problems, but most rural Alaska communities don't have either.
A model that seems to work? Paid management separated from politics, and engineering and operational expertise. Each community may have a different O&M solution.

S. Konkel:

Given politics, and the way of delivering service, is there an innovative approach to build cooperation or capacity in the community?

- Nichols: We see an operator paid 4 hrs/day and an administrator paid 6 hrs/day. Administrator is the worst job in Alaska. You're expected to know everything! How to run the system, what samples to take, what the operator does, police responsibilities, everything in the village – all on 6 hrs/day. ANTHC has a building full of 300 people only doing W&S, and no two people in our building could run a complicated system by themselves, but we expect two people in a village to do that as an additional duty in their spare time. It's patently unfair.
Selawik joined ARUC because AVEC was going to shut power off due to a huge power bill. Though reticent to join, their view completely changed in a year. Why? For all these years, all their energy and concentration went into making W&S work. Now they have time and money to do all these other things they always knew they needed to do but didn't have time to do. Even for ARUC communities where we manage, communities with a strong relationship with their RUBA advisors are much stronger. We want to be partners with the community and RUBA.

Q2 to all: Funding agencies have established a sustainable threshold of 5% of MHI. Is that too high, too low, or appropriate?

J. Nichols:

It's about right. Rates go higher and communities subsidize to get roughly to that.

C. Bohan:

That depends on the priority for community residents.

B White:

I pay 4% in Bethel and I'm trying to shave it all the time. I haul my own water in summer and when I can in winter. 5% seems high to me. In many villages, operators pay \$200/mo in rent and \$128/mo in W&S. This almost needs to be from a more individual view. What are the high/low extremes in a village? Is one part of the village driving the MHI up?

M. Black:

Still, we need a benchmark number. It's fine as a benchmark upward limit. When homes pay more, you end up with honeybuckets back, and lose public health benefit.

In general, we don't understand what's behind the numbers. Ask this group, who knows as much as anyone. Outside of ARUC communities, you can't find any real numbers about what/why it's costing to run these systems, even for 10% of the communities out there. We don't have data, and we don't understand what data we do have.

E. Lohr:

We operate 24 communities. Of these, 5 are above 5% and 4 of those have subsidized through other means. We don't suggest it, they do. Only one of 19 communities below 5% subsidizes. The median rate is 3.4% MHI in 24 communities.

Q3 to E. Lohr: Besides providing funding to offset operational costs, what services could improve the sustainability of existing and planned systems?

One is collections. Correct, routine outside billing takes out politics and increases payment rates.

B. White:

I see many issues to solve at management level; politics of management are a huge issue. We need to give them education and options. Many managers' qualification? They applied for the job.

E. Lohr:

If someone has knowledge in the position, you're successful. That person leaves, and within months, RUBA's in there, we're in there, RMW is in there.

B. White:

It takes time to develop a good operator, but we don't look for another operator or administrator until that one just quit.

J. Nickels:

We could include high school students in training to get them interested.

M. Black:

We have to pay adequately to get more qualified people. Take St Mary's: It's remote with not a lot of money, but the salary for professional management is good. Their system generally runs better than neighboring communities. When we talk subsidies, maybe we should consider a regional manager for, say, 5 communities, subsidized with local contributions. This person could act as a professional manager and public works director for these communities. We have boroughs in this State, but they aren't charged with caring for their communities. If they choose to, great. But many functional regional governments don't take a hands-on approach to helping communities run W&S or other utilities. Write into borough charters that they are either required or subsidized to take care of it. (Cheryl asks: Do Native corporations help?) Rarely. There's concern about regional for-profit corporations involved in local politics and management. Some corporations provide money for capital projects; others may or may not take an active role in helping communities operate services.

E. Lohr:

Some regional corporations get involved in emergencies only.

C. Bohan:

I wonder if subsidizing the cost of the operators might be effective because often, operators get paid for only a few hours, and probably are either not spending enough time in the plant or not being paid for all the time they spend. They never get ahead and can do the bare minimum, so there's low incentive to stay. On the operator certification side of my job, they don't provide much incentive to keep operators. While decent pay could create competition and encourage forward thinking, the current setup can encourage hopelessness.

E. Lohr:

Based on surveys from the 80s, 96, and 06, six of the communities have never changed rates. We will do a survey this summer. Most don't charge the necessary rate to cover system operation, and most don't collect the rate they do charge. The bottom line is to collect user fees before we can start paying people.

Thoughts from the floor?

G. Magee:

In the 24 ARUC communities, what are the rates?

- E. Lohr: The minimum is \$75, and we have 6 in that range. The maximum is \$200. A rough average is \$110-120 for the full W&S system. We are charging the appropriate rate for all expenses incurred but not for our management costs, which are funded partly

through grants. The biggest increase was \$40 last year. We run these to break even. Every expense from a community is paid by that community.

B. Lefferts:

Enforcement is hard in non-piped communities. You can't shut someone's honeybucket off.

- Ed: Honeybucket is the hardest. We tried to run one and weren't successful.

D. Caldera:

Does a community have only one operator?

- J. Nichols: ARUC communities have 1 main operator and 1-2 backup operators.
- B. White: My communities sometimes have two operators, but they trade off (2 weeks on, 2 weeks off). Only 2 of 15 communities have more than one operator available at a time. Also, I have to talk to the administrator ahead of time if I need more than their 6 hours, since overtime isn't available.

D. Caldera:

With subsistence pressures, living pressures, etc., putting all O&M responsibility on one person is difficult. What about an itinerant regional operator?

- J. Nichols: NSB does that. Operators from Anchorage spend 3-4 weeks traveling, find problems, and fix them. They spend \$50M/year on 7 villages versus my 4M/year on 24.

Q4 to B. White: How can we more effectively incentivize more effective O&M?

Stop rewarding failure! In a couple of my villages, the best option would be to do nothing and let it freeze. They'll get a new system. They're behind on RUBA, have poor management, and can't get money to save their lives.

If we could tie the O&M subsidy to actually *doing* the O&M, it would be better. We have no carrot. We need a checklist: Do you have an O&M plan, spare parts, etc.

C. Rosa: How did this happen? Why do we reward for failure?

B. Griffith:

There's no reward for best practices. They either understand the benefits of proactivity (long lasting, less cost) or they don't. Usually they don't.

M. Black:

We have reverse incentives. Your system freezes, and you get a new one. You get jobs. Maintain the system, extend it, and you get nothing. When RUBA was created 25 years ago, we couldn't ask the State to incentivize maintenance. The only incentive we have is capital dollars: meet the essential indicators, get capital dollars. We have no subsidy for O&M and extending system life.

E. Lohr:

This discussion is not new. S. Colt has written several papers on it. His papers from 1994 and 2003 argue that current subsidies, etc., are poorly structured and reward the wrong behavior. This has been a known problem for 25 years.

D. White:

Operators get some training in a village to reach Level 1, then move to a Level 2 job in Barrow and a Level 3 job elsewhere. The key is getting good feeder programs. For years, Job Corps has been training operators. What programs could be grown or subsidized to supply Level 1 ops?

- C. Bohan: Job Corps is relatively successful. I've also heard the Veterans' Administration

is major player to work with. They can subsidize to bring veterans in as trained operators. High schools are a great idea but require intense work.

- B. White: I work with 15 villages personally and 48 or so in the YK delta. I haven't met one Job Corps-trained operator. (D. White: They only graduate 5 per year or so, but we could grow a State component of the federal program). I like the idea of this concept; we've talked in Bethel about that type.

Whenever you pull someone out of region, they get trained, they will take a good job elsewhere. I don't blame them. We need regional training centers or curriculum that can be taught locally. Could high schoolers get certified?

D. Wagner:

We've been looking at this same issue since 1979. Why? Nobody has the authority to fund the no-brainer option!

- C. Rosa: We can't pass costs to users because of the MHI issue, right? We could incentivize with retention bonuses, etc., but how would it be covered? Adding money to monthly bills? Could local communities do that?
- M. Black: They can do what they choose, but there are tensions. Jobs are scarce. Making a job attractive means certain individuals will get it, and they may not be the best. We still need accountability. Without a regional career ladder approach and accountability, increasing pay won't improve operations. The State is going through this with Village Public Safety Officers. They're the least paid in their careers with no career ladder.

T. Ritter:

This is not a good selling point for being an operator. How do we get high schoolers excited about a job that is underpaid, underemployed, overworked, and undersupported? Make it a good job, and you'd get more qualified people.

M. Brubaker:

Despite the poor salary and lack of security, it's a critical role for public health. It's interesting that with all the positions embraced by the federal system, water operators are off on their own and vulnerable, sometimes not even paid. Community health aides are covered. RHOs can allocate funds towards clinical and environmental health activities. Often, the W&S needs get overlooked. Has the federal government engaged on the local level?

- E. Lohr: The BIA program has subsidized water operators in some communities. That's the only one I know of.
- D. Ondelacy: There's a degree of authority for IHS under 86.121.437.2 to provide O&M assistance, but Congress has never appropriated for it and Alaska speaking alone is not allowed in the structure. Tribes formulate an overall annual budget request and provide it to the President/Congress, and they've never requested O&M funding. If Tribes at a national level requested that funding, in theory it could be provided, but W&S were #10 on the priority list in FY11/12 under things like diabetes and cancer.

S. Konkel:

Some people show me their certifications with pride. Would a benefits program help retention?

- J. Nichols: ARUC provides retirement program, but results on that are mixed.

Q5 to M. Black: How could we get a subsidy similar to PCE off the ground?

Comparisons to PCE are problematic.

Because Congress and the State Legislature have abhorrence to getting involved in O&M and assume local responsibility, we need to create an education program demonstrating the overriding need for proper O&M, that it makes fiscal sense, and that \$2B in infrastructure is at risk. Subsidies can extend system life. 15 or 20 years ago, S. Colt determined what it's worth to extend system life just one year: \$2.4M at that time. That gets attention.

Q6 to C. Bohan: How would a subsidy be distributed among communities?

Each system has a different complexity level, cost, and community ability to pay. Maybe we should have a larger subsidy where O&M costs are higher and economics are lower.

Thoughts from the panel?

B. White:

Because MHI is a project stopper, existing systems over the limit should get a larger subsidy. We also need to incentivize better O&M with bonuses for completing O&M and for meeting certain objectives to extend system. We need to direct the money straight to O&M with a reimbursement-style program that offers some money up front.

We talk about the rural/urban divide. Well, when we spend a dollar in the village, \$.90 goes back to Anchorage. We need help people make that connection. It's not dumping money in rural Alaska. We are subsidizing engineering firms and others – we're subsidizing Anchorage!

Questions from the floor?

M. Black:

The State does revenue sharing with communities using a formula based primarily on population. In the past, it used to have some basis on services provided, like how many miles of road the community maintained. Right now revenue sharing is \$60M/yr through an endowment. With some support from the federal government, we could likely make a convincing argument to Alaska to add a W&S component to revenue sharing.

T. Hennessy:

Has an economic argument for an O&M subsidy been developed?

- M. Black: If everyone read S. Colt's work they would be educated about the value of subsidies. But it's buried now, and it needs to be updated for 2012. Updating it would be the first step towards a subsidy.

Break for lunch at 12:06.

Reconvened at 1:03 p.m.

Presentation 3: Troy Ritter

Water & Health in Alaska: Considerations for Water Quantity

Water service has been proven to lower acute respiratory infections, skin infections, and invasive pneumococcal disease, and Alaska has the highest rates of these three diseases in the world. A third of babies are hospitalized in Alaska every year with acute respiratory infections. These three diseases have something important in common: while some diseases are waterborne, these are water-washed. In other words, their transmission is interrupted through hand washing.

I have done a lot of water-following. In a Nunam Iqua "field test," I hauled two loads of water in a 15-gallon container. It took the better part of an evening. In a home with six people, they do this a couple times a week and not more because it's hard and time-consuming. We say, "Go get a lot of water and use it." That's much harder than it sounds. Think about physical limitations and people who have to rely on others.

So, how much water do we need for optimal health? Some external entities have developed guidelines using only a few recycled studies. Those with internal fixtures require 26.4 gpcd according to WHO and 15.9 according to CRUM (which assumes a large haul tank). Those without internal fixtures require either 13.2 (Gleick and WHO) or 4-5 (Sphere Project and UN Refugee Agency, both calculating for emergency needs only). Internal fixtures are not as efficient; a toilet uses 10 gpcd easily.

With all these different numbers, we can't come up with a good, consistent guideline for Alaska. The needs are specific to each system type and each community.

In a study collaborating with T. Hennessy and T. Thomas, we collected comparative data on 4 villages that started with self-hauled water and ended with pipes. We've observed water use in self-haul households, in households transitioning from self-haul to piped, and in fully piped households. The study wraps up in April 2012.

We found that self-haul homes use 2 gpcd, maybe 3 in summer, with a large percent of the use from the steam bath. There are obvious signs of water rationing: Residents use river water instead of treated water and the same water in the washbasin over and over for 3 days. The water in these washbasins has similar bacteria counts to wastewater. The washing machines also use the same bucket of water over and over. In extreme cases, residents use the washbasin until the water is too dirty, then pour it into the washing machine. Staph lives through scenarios like this.

Soap and water use aren't important on their own, but they are good proxy measures for what we really want to study: hand washing and bathing. To study soap use, we weighed soap dispensers and refilled them each day for 3 years. Liquid soap use increased by 300% over the course of the study.

When we map data on changes in water and soap use over time, the lines go up at the same rate at first, but diverge at a certain point. The point where they diverge is a key indicator of how much water a community's residents need for optimal health. It starts to happen at 26 gpcd of water and 8 grams pcpd of soap. Interestingly, 26 gpcd is the WHO standard.

Feedback from residents of our study villages was consistent: when they got piped systems, they started bathing and washing their hands more. Some even drew direct connections to health.

The single most interesting thing we've learned comes from our data on change in water use by village. It resulted from something we tried to avoid. Three of four transitioned to a WHO-optimal water use level. One stayed low. The first three used a flat rate for water service. The last

one was a metered system, charging per gallon. Use stayed low because humans naturally limit use when doing so will directly lower their bills.

Regarding washeterias, studies in one village showed that for about half the people, nobody in the household had gone to the washeteria for any purpose in the last 2 months.

Preliminary data on self-haul and small-haul systems suggests no difference in water use between the two. Water use stays at 2 gpcd and practices are similar. Small-haul may address the mechanical side of sanitation needs, but it doesn't deal with human/behavior aspects.

The faucet in the house doesn't help until someone turns the water on and uses it right, so we've spent a lot of time with education and promoting use. We went to a popular opinion leader, the Chief's wife, in a community where 30% drank treated water and where we've been handing out info for a long time, but 60% of the people were still afraid of the treated water. We involved her in water testing, and when she told the community, they believed her. The rate is now over 70%.

Ultimately, there's no magic number for Alaska. But a simple modeling approach could do better than a health research study. We know how often people need to wash hands and bathe, and we know how much water each takes in a given system. We can achieve optimal health through an integrated approach that includes provision of infrastructure, proper O&M, and education to encourage healthy water use behaviors. Affordability is crucial, and user fees shouldn't be tied to use even if the rate seems affordable. Education can have huge impacts. We've seen small haul systems with teacher housing work well using flat rates per haul.

Questions from the floor?

D. White:

Decentralized systems' feasibility assumes the ability to haul. Has there been a study looking at what percent of the population in a given type of community could haul?

- No. We could probably look at general studies on physical disabilities for our 4 villages. So far we have analogies, like an older woman who drinks treated water in winter and untreated in summer because her son is gone at fish camp during the summer.

D. Poage:

Do metered systems start at gallon 1?

- I believe it's a flat rate up to 5 gpcd or so. For this community, it was an equity issue: why should a home with 2 people pay the same as a home with 10? Stepped rates are better than metered, but people are still thinking about use and relating that to cost.

T. Hennessy:

Another condition on the list is dental caries/cavities in kids; we see higher rates in communities with non-fluoridated water. To have fluoridation, you need pipes. Rural Alaska kids have the worst dentition of any kids in the USA.

I appreciate your nuanced approach to water quantity. For example, J. Warren talks about how not every use of water is efficient. We could use lower-flow faucets, etc. The danger with no number, though, is that engineers can't use it as a design parameter for a system. A community may be "served," but a haul system is the same as being unserved if they're using the same amount of water. Some water volume quantity is important to include in design and construction.

- Yes, there needs to be a number for a given community. Before we build, we have years of planning and ask lots of questions – but we haven't asked them about water use and needs. When building a multi-million-dollar W&S system, we should design specific to the community by developing a number during the planning stage.

Presentation 4: Aaron Dotson (UAA)

Novel Technology in the Alaska Situation

I'm here to describe how "novel" technology fits in the scheme of Alaska W&S. Novel ideas could get National Science Foundation funding.

Many trendy novel technologies aren't good for rural Alaska, like nanoparticle impregnated sorbents/ion exchangers, advanced oxidation processes, hydroxyl radical promoters, etc.

Novel technologies have risks. You have O&M unknowns like an e-beam system in SoCal, which grayed out half the base. Novel systems are hard to learn, and we haven't tested them in extreme cold or the wide source water quality variations found in Alaska.

We need to find realistically novel options. For example, we could use proven technology from other fields or existing technologies in innovative combinations.

Two technologies proven in other industries could work well here. For water, Tubular Membranes are robust, create good water, and are easy to operate, but do use a little more energy. For wastewater, Subsurface Injection takes away open access to a lagoon.

We should look at other industries like industrial engineering, which has technology to treat fluids far more challenging than water. We should also ask some questions: Does washing water need to be same quality as drinking water?

Very robust, advanced point-of-use systems can be more cost effective, as in one 100-home area with arsenic in the well. We may also want to consider whether a shorter design life for things like pump stations would allow for better quality. We could have online monitoring for particle counters/bacteria, use UV for organic matter, etc.

Can we connect treatment processes within a region to build a more robust regional system?

To take advantage of novel technologies, we'll need applied research, which may not always result in construction, and pilot tests/demonstrations to see how real systems work in real situations.

[No questions from the floor.]

Presentation 5: Brian Lefferts

Ensuring R&D Addresses Local Considerations

T. Ritter mentioned the community whose opinion leader boosted water system use from 30% to 70%. D. Wagner mentioned Brevig's ice buckets in use the day piped water came into service. And these are not new technologies! Now we're talking about novel technology, never used in rural Alaska, and we hope that people will have an immediate high adoption rate. As D. Ondelacy said, the community must want and need a system for us to have success with adoption rates.

Stakeholder input is crucial, and everyone should be involved throughout the process, including local end users, RUBA, ARUC, RMWs, etc., to bring all opinions together in planning. The Charette Institute found that we need 4 days together in the planning stage to get the buy-in needed with concepts, alternatives, refinement, and final plan. This would be a departure from our norm for capital project planning in villages.

The Oscar Alexie Conversation Diagram was developed by a Yupik Eskimo instructor at Bethel's Kuskokwim Univ. The right-side-up pyramid is our usual practice: start with the issue and build the argument wider and wider, looking at O&M, health benefits, etc. The Yupik way

inverts the pyramid, starting with the issues and building up to the topic. Keep that in mind. We will leave with a plan, but we need to take the time to go back, listen to community stories, and ensure that what we design meet their needs and wants.

To maximize health, systems must be sustainable, and designs must involve all stakeholders. They must be culturally relevant, wanted, and needed.

Questions from the floor?

D. White:

We talk about what the community wants. In Fairbanks, we had a 5-year fight over fluoride in water. People were very divided. What's your experience with arriving at a consensus, especially if they are divided in a variety of ways?

- Education is very important, with an argument and opinions that people can trust. We're not there to sell something, just to provide the facts. One possible problem with fluoride is that anti-fluoride views play on fears and spin half-truths. The same happened with our old haul system arguments. We weren't fully honest about the O&M expenses, so the community would agree to a system and only realize the reality later on. In Napaskiak, the half with FT&H are basically at same level as the half with honeybuckets. We need all components together: wanted, sustainable, health benefits, cultural.
- Mike B: If you say you want to do what they want and need, you have to be ready to accept their opinions. One community didn't want to look downhill at their lagoon, so they put it uphill and have to pump sewage uphill – very expensive. They didn't understand that at the time. Then you have communities saying they don't want service because it's expensive. What then? It's an interesting challenge for agencies with very limited, narrow missions and objectives.

C. Rosa:

What happens when what the village wants is inconsistent with maximized health outcomes?

- T. Ritter: Take the community with metered water. I felt it was a bad idea and approached it from an education standpoint. In the end, the community decision makers said thank you, we're metering. Our obligation is to provide sound, scientific information. In the end, this is their health. We're here to support them with good information.
- T. Hennessy: We've learned things on how people actually use water that we could incorporate it into the way we design systems. A better understanding of how communities use and value water/raw sources, how they feel about rainwater as a resource, etc. could lead to designs/systems that go the direction where people will use the water.
- B. Lefferts: We need to involve key stakeholders in the early stages.
- S. Konkel: These are dynamic situations with a lot of history and promises that weren't kept. Look at the local history in places without pipes or considering sanitation options.

Breakout Session intro: Cheryl, 2:13 p.m.

Feedback last year said cross-pollination was very beneficial, and we are building on that. Our 3 presentations set the stage. This afternoon's goal is for 3 groups, in parallel, to formulate a plan to find decentralized solutions that provide in-home water in appropriate quantity and quality and remove waste at affordable capital and operating costs. Today, we are finding collaborative strategies for how to move forward on solving the problem, not the solutions themselves.

The three groups tend to apply for different pots of money. Group members are a mix of people from all perspectives.

The ultimate goal is to improve health outcomes. R&D can include social and economic research. Assume available funding.

1 University - Dennis Wagner

Mike Brubaker, Steve from UAA, Tom Hennessy, Ed Lohr, John Olofsson, Doug Poage, John Warren, Deb Caldera, Dan White, Mike Black

2 Agencies - Bill Griffith

Carrie Bohan, Jay Butler, Aaron Dotson, Jack Hebert, John Nichols, John Nickels, Brian Lefferts, Alan Parkinson, Troy Ritter

3 Tribal - Cheryl Rosa

Steve Bolan, Steve Colt, Tasha Deardorff, Eric Lespin, Greg Magee, Nancy Nix, Tim Thomas, Bob White

Group Summaries

Q1: Lay out an approach your group could follow to advance R&D to find decentralized/sustainable solutions (see Charge to Group).

1. First, look back. What have we done? What were our successes and failures and why? We must define where we've been, or we'll repeat mistakes or see proposals for what works in the lower 48 that doesn't work here.
2. Complete a current state of affairs assessment, define patterns of use, and compare them to similar systems. Use the information to define needs/outcomes/goals from a public health perspective in an RFP encouraging cross-pollination and multiple parallel projects.
3. Being realistic, most tribal groups don't have capacity to come up with an R&D idea de novo. ANTHC has the overall capacity, but not specific R&D capacity or funding. And some villages won't be getting a piped system, so we need to set realistic expectations. We should develop approaches to bringing in the private sector, improving communication of needs between communities and ANTHC, and connecting R&D opportunities with ANTHC. We should improve ANTHC's capacity for R&D if they are the vehicle. Regarding University partnerships, ANTHC is the most promising route for tribes. We should team with RuralCAP and corporations to get funding and increase the visibility of local needs. We hope to better incorporate local needs into the process.

Q2: List specific collaborative relationships/partnerships that may be beneficial to your effort.

1. Universities, agencies, and groups outside the W&S world – housing authorities, communities, RHOs, for-profit and nonprofit corporations. Take a holistic community view and involve everyone.
2. All stakeholders, ANTHC, VSW, SOA, EPA, UAF, UAA, drinking water labs, international partners like Water Canada, end users, community partners, RHOs, and THOs.
3. There's not a lot of collaboration now in the normal course of business, but in catastrophic failures or large, immediate problems, groups come together. The University could collect/analyze/synthesize the data key to making informed decisions, complete long-term

monitoring and analysis, and summarize historic viewpoints to counter the lack of long-term memory all of our groups have identified. Agencies are funding sources, but not partners right now. They can assist with planning, the Charette process, applications, master planning, feasibility studies, and directing tribal groups to the right entities for assistance. Tribes should collaborate with local/regional corporations and ANTHC for funding and capacity.

Q3: How would you best organize your group?

1. This should not be a group, but a program run by someone who runs it full time, not as an ancillary responsibility. It will not get as far as fast as it needs to be if it's ancillary. One organization that might be well suited to contain this position is the Denali Commission. The program would seek many grants over time for designing, constructing, monitoring, etc.
2. We suggest a small committee of stakeholders who would put out the RFP with some rules and scoring. A larger group would provide review, while the smaller group would keep things moving and make final decisions.
3. This needs a central organization with regional common groups to determine needs and solutions. How do we present community needs to ANTHC? A local person from the tribe or RHO working on behalf of a village would contact the ANTHC/VSW project manager.

Q4: What would your group's research priorities be?

1. Put together a historical summary of efforts, successes, and failures (University). Develop a plan to conduct R&D addressing users' needs and wants, as B. Lefferts presented. Economize on water use, decreasing it in acceptable ways. Plan to gather ongoing performance data. Define parameters up front for a system – quantity, energy use, cost, etc. Evaluate the options in responses to the RFP (University).
2. Develop a system to meet local needs and considerations, optimize health, and be sustainable.
3. Conduct background research on water use, behaviors around water, and how to make research presentations credible (we need to restore trust). Study overall energy use and system needs. Consider the core values and cultural values of each specific community; not all are the same. Figure out how to increase R&D capacity for ANTHC and VSW, who are the logical next-step connections for local entities.

Q5: How would you take local users' needs and issues into consideration?

1. Define priorities for local users prior to doing any research or preparing an RFP. Engage them on finances, water usage, etc. early on before we go out.
2. Consider spending a longer time with the community at several key points in the design process.
3. (This group represents the local user.)

Q6: What are your group's ideas for strategies to approach long-term data collection and local monitoring?

1. We see several approaches. Establish specific parameters and ways to fund them. Study test scenarios in a controlled environment, like a University model house. Then, complete village-based pilot testing of the black box, system, and process, taking into account health behaviors by the family, economics, and weather. Performance data could include remote monitoring

approaches. Use testing scenarios to gather data on external factors like climate, weather, precipitation, water quality, etc., to bring climate change issues in. Create an endowment modeled after the mining industry to fund ongoing student research and long-term monitoring. Develop a research center, probably University-based (AEA includes in new awards that data must be sent to the Center for Energy and Power for performance feedback to AEA).

2. Conduct local monitoring. Identify partners in community, such as part-time local residents we hire. Install remote monitoring devices in projects.

3. The group expressed reluctance with tribal groups engaging the University because it often doesn't go well. It's better for the tribe to contact ANTHC to act as liaison with the University.

J. Warren: ANTHC has the Center for Climate and Health, working with UAF. We have MOUs and collaborative research projects. With UAA, we have the Institute for Circumpolar Health.

Q7: What initial steps need to be taken to get this effort off the ground and keep it going?

1. The last great policy advances in sanitation happened 20+ years ago. Until a range of groups come together and they understand the whole issue, nothing major will change. First, we need to bring together stakeholders including Native corporations, our delegation, agencies, organizations, and the Legislature to educate them on the need for R&D, the health benefit of serving unserved places, and what is at risk. Then we need to sustain the effort. This is presenting a great opportunity to innovate rather than stagnating. It has commercial interest and national interest.

C. Rosa: Why isn't the University already doing this?

D. White: We have the structure, like with the AEA/CEP partnership. Our faculty work based on grants and need the funding to pay for the research and staff.

B. Griffith: So all this money has to come from outside the University system, and can't be generated through University effort?

D. White: In some cases, we can ask the Legislature for capital requests and operating requests. The CEP was created by University request as top priority. They fund the director and some staff, but all project money (99% of our budget) comes from outside sources.

S. Colt: The climate change excitement a few years ago fell flat on its face. The University could do a better job of packaging some requests in terms of immediate State needs. This is arguably neglected in favor of seemingly sexier topics. Multiple collaborators from many fields help, but it's not clear how to get the State's attention other than through political lobbying efforts.

C. Rosa: Someone needs to talk to Sen. Kookesh.

D. White: You can't hire personnel for capital improvements, which are 5 years or less, but you could offset a professor's time for a course waiver or summer salary.

M. Brubaker: If I wanted ideas, I'd go straight to the RMWs. They have low turnover and long-term firsthand experience working on real-life problems with W&S systems. They're the group we rely heavily on for fixing problems, but we don't approach them enough about their ideas for how to fix the larger problems. They have a wealth of knowledge we could tap into.

2. We need money. Identify a pre-project group. People at this meeting would go back and start working on Step 1 and start defining goals and parameters for the RFP.

3. We need to create better communication between communities and ANTHC, a better arrangement for ANTHC to do R&D, and a better overall relationship between ANTHC, the University, and communities. We need honest communication between ANTHC/VSW and the

communities. If they're not getting pipes, have an honest discussion about where to go from there. Convene communities that will not get pipes to start a dialog and encourage central organization.

Q8: What ideas do you have for funding an effort like this?

1. We didn't see this coming from any one source. It requires a broad-based effort to piece funding together from many sources with sustained organization, leadership, and vision. A long-term commitment is necessary if we want to attract the University to evaluate, to engage our communities, etc. It will take much more than the initial \$1M.

[Groups ran out of time to discuss.]

M. Black: Thinking strategically, the Commissioner could only request \$1M, but the dynamics of the session are such that there's an opportunity for more than that. Questions will come up if we suggest a higher number: How would you organize the effort? What are you doing with this money? How will you address the needs of *my* constituency? We need to clarify what the Commissioner wants to do and how the communities fit in.

C. Rosa: Besides B. Griffith as our conduit, how do we best inform the process? A one-page, executive summary with group outputs?

M. Black: If we have consensus, whatever comes out of this group must be offered to the Legislature. We have to show that there's more support than just DEC asking.

Bill G: Let's find themes and show them that we received wide input. We want to see not just this one effort by this one appropriation, but other things growing and long-term efforts. Let's distill this meeting's outcomes to share with the group.

D. Caldera: The common themes I hear include assessment of need, reaching out to engineers and problem-solvers, evaluating, and monitoring.

T. Hennessy: Another theme is to engage the University.

B. Griffith: Another is concurrent efforts. This won't be about a single process to find The Answer. It will require ongoing, collective efforts that cross-pollinate to provide different solutions to different problems.

T. Hennessy: A task force can provide some oversight from a bigger picture using their broad-based, collective wisdom and experience to move discussion forward. This will be a sustained effort.

B. Griffith: "Sustained" is the tough part. Nobody's ever paid to do that job. It's a bimonthly meeting with homework.

M. Black: Think of the budget request as evidence of State and Commissioner's interest, but challenge other organizations like Denali Commission and our delegation. We're talking about a fairly small amount of money, really. Just like the Center for Climate and Health, we need a Center for Sanitation. It's a bit ironic that we're talking collaboration after \$2B, but it was needed back then and it's still needed. The Governor still has 6,000 households unserved and facing the consequent health issues, so this issue should be a key issue for the State.

D. Caldera: We need to explore how to extend system life and be strategic in preventing catastrophes.

J. Warren: The Center for Climate and Health is a model of sorts, overseen by a wide range of people who its efforts. It has a web site sharing info, works closely with communities, completes assessments and plans, and collaborates with the University and other agencies. We need

something similar at ANTHC/EPA/Denali Commission/DEC; someone has to take the lead with the support of a group.

D. White: We are often asked to do basic research, but we have the ability to do more complex research as well. We've been monitoring groundwater levels in Nome wells for 7 years. We have a web site for operators, and they call us all the time. If we had a program to remote monitor/collect data, we would have a body of data they could when they need it.

C. Rosa: Thank you to the Steering Committee. We will work to get a product together soon, within a couple of weeks, and provide some alternatives for input.

Meeting adjourned at 5:08 p.m.

DRAFT