UTILITY ADVISORY BOARD AGENDA

April 10, 2025 at 5:15 PM

Water Utility Shop 2520 Barrett Ave./Zoom Webinar

https://juneau.zoom.us/j/83013202186 or 1-253-215-8782 Meeting ID: 830 1320 2186

A. CALL TO ORDER

B. LAND ACKNOWLEDGEMENT

We would like to acknowledge that the City and Borough of Juneau is on Tlingit land, and wish to honor the indigenous people of this land. For more than ten thousand years, Alaska Native people have been and continue to be integral to the well-being of our community. We are grateful to be in this place, a part of this community, and to honor the culture, traditions, and resilience of the Tlingit people. *Gunalchéesh!*

C. ROLL CALL

D. APPROVAL OF AGENDA

E. APPROVAL OF MINUTES

1. March 13, 2025 - Regular Meeting

F. AGENDA TOPICS

2. Utility Update
3. Annual Report - Due May 31, 2025
4. Discussion: Pyrolysis

G. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

H. NEXT MEETING DATE

5. May 8, 2025 @ 5:15 PM

I. SUPPLEMENTAL MATERIALS

J. ADJOURNMENT

ADA accommodations available upon request: Please contact the Clerk's office 36 hours prior to any meeting so arrangements can be made for closed captioning or sign language interpreter services depending on the meeting format. The Clerk's office telephone number is 586-5278, e-mail: city.clerk@juneau.gov.

DRAFT MINUTES

UTILITY ADVISORY BOARD MINUTES

March 13, 2025 at 5:15 PM

Water Utility Shop 2520 Barrett Ave./Zoom Webinar

https://juneau.zoom.us/j/83013202186 or 1-253-215-8782 Meeting ID: 830 1320 2186

A. CALL TO ORDER

Meeting was called to order at 5:20 PM.

B. LAND ACKNOWLEDGEMENT

We would like to acknowledge that the City and Borough of Juneau is on Tlingit land, and wish to honor the indigenous people of this land. For more than ten thousand years, Alaska Native people have been and continue to be integral to the well-being of our community. We are grateful to be in this place, a part of this community, and to honor the culture, traditions, and resilience of the Tlingit people. *Gunalchéesh!*

C. ROLL CALL

UAB Members Present: Andrew Campbell (Chair), Stuart Cohen, Geoff Larson, Grant Ritter, Buffy Pederson

CBJ Staff Present: Denise Koch, EPW Director; Brian McGuire, Utilities Superintendent; Chad Gubala, Production & Treatment Manager; Nathan Bodenstadt, Utilities Administrative Coordinator

D. APPROVAL OF AGENDA

Approved without comment.

E. APPROVAL OF MINUTES

1. February 13, 2025 - Regular Meeting

   Approved without comment.

F. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

No Public Participation

G. AGENDA TOPICS

2. Utility Update

Chad Gubala reported on recent federal regulatory changes and their impact on utility operations:

- Suspension of regulatory actions by executive order in January 2025
- Utility response includes enhanced focus on best management practices and documentation
- Lead Service Line Inventory (LSLI) program continues despite regulatory uncertainty

Brian McGuire provided an update on current staffing challenges:

- The Wastewater treatment team is currently very understaffed, and many operators with a significant amount of experience are unavailable. The Utility has been working to fill positions.
- One new local hire started this week
- Ongoing vacancy for water treatment operator position
- Field operations supervisor position has two candidates scheduled for interviews
- Source control coordinator position in classification process

Discussion of upcoming water system maintenance:

- Planned Salmon Creek water outage for April-June 2026 due to AELP upper Penstock replacement
- Testing of pressure configurations for water supply system planned. Some questions were raised about adequate water for fire suppression to the community during the outage, which the Utility expressed awareness of. There is little concern of a loss of pressure in downtown Juneau as that area is served by Last Chance Basin. The Utility continues to work on plans to ensure adequate supply for fire suppression and regular use is provided to the rest of the distribution system.
- Suspension of cruise ship water supply during the maintenance period was discussed, and cruise companies are already aware of this restriction.

3. Discussion: Industrial User Rates

Stuart Cohen led discussion on reviewing industrial user rates:

- Current sewer code contains ambiguous formulas for industrial user charges, and are not consistent throughout the code. One section specifies a formula based on waste compounds, while another sets a flat rate.
- The Utilities team has explored rate structures used by comparable utilities to develop a more appropriate approach.
- The group discussed several key considerations, including equitable charging for different types of users, cost implications of lift stations and other infrastructure, and the need for a fair rate structure for cruise lines and waste haulers.
- Some next steps including extending the CBJ SCADA system into the collections system, reviewing administrative and permitting issues, and developing improved monitoring processes.

This conversation led to a discussion of the biosolids pyrolysis project:

- $2 million grant application in process for design phase to process biosolids.
- Potential to save $2-3 million annually in biosolids transportation and disposal costs
- Implementation would require an additional $4-5M after the design phase.
- Project will complement existing biosolids crusher project
- The project received assembly approval on March 3rd. The next steps include securing DEC approval and navigating CBJ procurement processes. Implementation would follow other ongoing engineering projects, including the Utilities Crusher.
- Mr. Ritter raised questions about cost comparison between pyrolysis and standard incineration methods. Discussion was tabled for a future meeting due to time constraints.
- Potential benefits of the pyrolysis unit include producing biochar and carbon black that could be a revenue source for the CBJ. Additionally, removing PFAS from biosolids through the pyrolysis could eliminate the need to ship biosolids out of state, which would have a significant annual savings.

4. UAB Terms and Annual Report

Mr. Bodenstadt shared with the UAB that one member, Ms. Pederson, had a term ending in May 2025. He also reminded the UAB that an annual report was due in May 2025.

H. NEXT MEETING DATE

5. April 10, 2025 at 5:15 PM

I. SUPPLEMENTAL MATERIALS

6. Congressionally Directed Spending Letters- Approved & Signed 2/13/2025

J. ADJOURNMENT

Meeting adjourned at 6:26 PM.

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Information from C. Gubala regarding Plasma Technology

The latest estimated costs of using plasma technology to treat biosolids for PFAS removal varies based on several factors, including the specific plasma system used, the scale of the operation, and energy costs. However, general estimates from recent research and pilot projects suggest:

• Capital Costs: A full-scale plasma treatment system runs between $5 million to $20 million, depending on capacity and technology sophistication.

• Operational Costs: Estimated at $500 to $1,500 per ton of biosolids treated, primarily driven by electricity consumption.

• Energy Consumption: Plasma arc and other high-energy plasma methods typically require 300 to 600 kWh per ton of biosolids, translating to significant electricity costs.

• Disposal Savings: Plasma treatment can reduce the need for landfill disposal or incineration, potentially offsetting costs.

CBJ Utility Biosolids Brief
Waste re-processing and reuse via pyrolysis processing

Chad P. Gubala, Ph.D.
Brian McGuire

2/23/25

Executive Summary

In order to affect a significant reduction in its O+M costs for secure biosolids disposal CBJ Utility staff prepared, submitted and was recently awarded ~$2M of a 100% forgivable loan through ADEC's SRF program in 'Emerging Contaminants.' This loan/grant provides funding to conduct a design phase for a BioForceTech, (BFT; https://bioforcetech.com) biosolids pyrolysis project in Juneau. BFT pyrolysis is a multi-staged thermal processing method recently shown to process biosolids into a beneficial product (biochar) while also destroying and/or containing PFAS emissions to safe levels. Once this step has been completed, the CBJ will make a determination as to project readiness, seek funding for a full installation and construct/consign this addition to the biosolids processing system.

1.) Background

a. Municipal Biosolids:

Sewage from households, businesses, and industries dischargers are biologically treated as a combined waste at public-owned wastewater treatment plants. Once wastewaters have been processed to acceptable levels, the liquids are separated from the residual solids, sanitized and safely discharged to receiving water bodies. The residual solids are separated and treated physically and chemically to produce nutrient-rich, semi-solid materials known as biosolids, which are comprised of remnant organic materials and other substances that are not affected by biological treatment processes.

At lower latitudes and in warmer climates, municipal biosolids are most commonly recycled as a fertilizer and soil amendment provided that they are sufficiently free from hazardous substances (i.e. metals, fuels and synthetic organic compounds). Other common uses for biosolids include bricks and construction material, vitrification (glass manufacture), bio-fuels, and fuel substitutes (cement works).

b. PFAS:

Since the 1940s, a new and large (<15,000) class of fluorine-based chemical compounds, known as PFAS (Per- and polyfluoroalkyl substances) had been developed and introduced into a range of popular consumer products including:

- cleaning products, paints, fire-fighting foams, water-resistant fabrics, and nonstick cookware, and
- shampoo, dental floss, nail polish, and eye makeup.

In 1998, the EPA was alerted to the health effects of PFAS, exposure to which at very low levels has now been linked to cancer, liver and kidney damage, cardiovascular diseases, obesity, and diabetes. Further, PFAS compounds do not readily degrade in any sector of the environment (air, water, land), earning them the moniker of 'forever chemicals.' The combination of their toxicity and longevity have made PFAS compounds a major environmental problem, rife with legal and regulatory liabilities.

The ubiquitous presence of these compounds in domestic and industrial waste streams has also created a crisis for biosolids reuse and/or disposal, since PFAS is not broken down in municipal waste treatment facilities and becomes concentrated in the remnant materials. Traditional biosolids reuse/disposal methods, in particular, agricultural land application, has been significantly affected across the U.S., as communities and regulatory bodies have sought to limit the redistribution of PFAS into foods and potable waters. Other reuse/disposal methods, including thermal processes, have been similarly curtailed due to the refractory nature of PFAS compounds.

2.) <u>Juneau's biosolids disposal strategy</u>

a. Current status:

Until 2010, the CBJ Utility had disposed of its biosolids through thermal destruction in an incinerator located at the Juneau/Douglas treatment plant. The CBJ decommissioned its incinerator in 2010 due to systemic failure. The Utility now barges its biosolids to Seattle and then transports them by train to Arlington, Oregon, where they are disposed into a secure landfill.

Cost and logistic issues associated with transport and disposal of 'wet' biosolids subsequently prompted the Utility to add a biosolids dryer to its treatment train, which reduces shipping weight and handling constraints. Currently, the Utility spends between $1.2-2.8M/year for biosolids shipping to Oregon (disposal costs are separate). A biosolids crusher is now also being added to further reduce shipping costs through volume reduction. The drier/crusher installations at the CBJ Utility were logical steps in addressing the biosolids disposal issue, but provide only an interim solution to this matter.

Concurrent with the CBJ Utility's use and optimization of shipping and secure landfill disposal of its biosolids, the PFAS matter had become increasingly problematic. A series of Federal regulatory actions commenced ca. 2002 through the EPA and have been becoming steadily more stringent with improvements to PFAS monitoring methods and an increasing understanding of human health effects.

Following the decommissioning of the CBJ incinerator, the Utility began to monitor for PFAS in its biosolids to determine the potential suitability for alternate reuse/disposal methods. The CBJ detected PFAS in its biosolids and continued monitoring has shown that this is now a persistent issue. Coincidentally, the biosolids processing and disposal methods that the CBJ currently uses also provide the best interim solution for controlling PFAS emissions or release from biosolids processing and limiting the CBJ's PFAS liabilities. Fugitive emissions from the dryer are passed through activated carbon, which

captures gaseous materials, including volatilized PFAS. And the recipient landfill is certified for receipt and disposal of hazardous materials, including PFAS. These control and disposal mechanisms are currently adequate to manage biosolids and PFAS. But, this de facto approach is costly and is unsustainable over the longer term due to secure landfill limitations.

b. Objectives and Desired Status:

A principal objective for the CBJ Utility is provide safe and adequate services to the community in a cost-effective manner. A major and recurring cost component for the Utility is the secure reuse/disposal of its biosolids. There are several components to the biosolids process that factor into the cost equation:

1.) Processing, Handling and Packaging
2.) Transportation (intermodal)
3.) Disposal fees
4.) Beneficial product offsets product and heat

For Utilities located in the continental US it had been relatively easy (until the advent of PFAS) to minimize these cost components through the beneficial use of processed biosolids for soil and agricultural supplements. Biosolids need only be dewatered (not dried) prior to transport. Transport distances are relatively short. Landfill disposal fees are not required. And in some instances, biosolids may be of monetary value to a consumer.

Conversely, the circumstances for Juneau add significant costs to the Utility's operations. Climate and landscape conditions do not allow for the beneficial use of biosolids as soil/agricultural supplements. Biosolids need to be dewatered, dried and crushed for optimal transportation. The nearest location of a secure landfill able to accept Juneau's biosolids is 2000 miles away and requires multi-modal transport venues. Disposal fees at secure landfills are costly, there are no consumers willing to pay for any of Juneau's biosolids products and we cannot even recover the heat capacity from these carbon by-products.

The desired status for Juneau is to find the means to reduce or eliminate the costs associated with items 1-3 and realize cost offsets through item 4. PFAS makes realization of this goal much harder, but not impossible.

c. Next Steps:

Given the circumstances, Juneau's most attractive option for addressing the biosolids disposal cost issue is to reintroduce a local thermal destruction method for those materials. Eliminating transportation and disposal fees alone would reduce O+M costs by $2-3M/year. Unfortunately, the increasing presence of PFAS in biosolids has complicated thermal processing options since fugitive emissions of PFAS are likely under typical combustion temperatures and gas resident times.

Fortunately, a multi-staged thermal processing method recently been shown to process biosolids into a beneficial product (biochar) while also destroying and/or containing PFAS emissions to safe levels. A California-based company, BioForceTech, (BFT; https://bioforcetech.com), has developed a pyrolysis-based technology for this purpose and now has 14 installations in place with 32 systems operating under strict Federal and State regulatory control (https://bioforcetech.com/equipment/installations).

CBJ Utility personnel has personally visited and inspected BFT installation and has been closely monitoring the development of BFT's pyrolysis product for over 4 years. The system is fully compatible with Juneau's existing biosolids processing train and would radically change items 2-4 of the biosolids cost component issues identified above. And with BFT's increasing success in addressing the regulatory considerations for PFAS, this approach now looks suitable for use in Juneau.
To facilitate the introduction of this biosolids 'solution' for the CBJ Utility, staff prepared, submitted and was recently awarded ~$2M of a 100% forgivable loan through ADEC's SRF program in 'Emerging Contaminants.' This loan/grant provides funding to conduct a design phase for a BFT pyrolysis project in Juneau, locking down construction methods and costs for a complete installation and securing regulatory approval. Once this step has been completed, the CBJ will make a determination as to project readiness, seek funding for a full installation and construct/consign this addition to the biosolids processing system.