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TRANSMITTAL MEMORANDUM

TO: The Honorable Mayor and City Council

FROM: Lacey G. Simpson, Acting General Manager

DATE: December 8, 2021

RE: **Project Status Reports of the KPU Division Managers – November 2021**

Attached for City Council review are the project status reports of the KPU division managers for the month of November 2021. Should the City Council have questions regarding the division managers' reports, staff can respond accordingly.

MANAGER'S REPORT
SALES, MARKETING & CUSTOMER SERVICE DIVISION
November 2021

Verizon wireless new phone sales in November were 10 times higher this year than last year, and were equivalent to the last few months sales. Sales would have been even higher if chip shortages had not reduced the ability for stores to order phones. Customers had to special order phones to receive models, especially with some iPhones. In addition to sales, more than 100 people requested technical assistance on their mobile devices. Assistance included simple tasks such as turning on roaming for visitors, which is required in Alaska, assisting with upgrades of software, trouble-shooting apps, and fixing settings on phones. The most significant portion of the help consisted of activating devices and transferring data on devices that people purchased elsewhere. They often do not remember their log-ins for cloud services, so staff assists them in resetting the accounts, mostly using KPU owned devices since their own are not working.

In November, both KPU's net internet and TV accounts increased, despite the number of people who were disconnected for nonpayment. A significant number of former GCI customers signed up for KPU service since GCI intends to eliminate standard TV service. Standalone, no phone-line internet accounts increased by a few percentage points from last year, as people cut phone lines in order to save money.

KPU's marketing and KPUTV staff designed and coordinated social media images, social media videos, and radio PSAs the Holiday Christmas Tree Lighting, Letters to Santa and the Santas on Firetrucks tour of the community. The tree lighting video and the Ketchikan Christmas Carol video debuted the Sunday after Thanksgiving at 6 pm on both KPUTV and on KPUtv's Facebook. The Christmas Letters to Santa began November 15th. Santa's elves have already begun to write responses to the children using postcards designed by KPU Marketing.

KPU Marketing also assisted the local health department, and partnered with Peacehealth to produce a series of PSA posts on COVID prevention at the direction of the City, Borough officials and local emergency management.

The KPUtv Crew filmed and livestreamed several Kayhi Volleyball, filmed the live version of Ketchikan Night Before Christmas, as well as the Christmas Tree Lighting. They also were able to film a number of sessions in Juneau while in town during the FAA drone test, including a Taste of SE with Alexandra

Vrabec, Juneau Downtown Association director. KPUTv also premiered the Native Foraging series at the Sealaska and the Juneau Art Walk.

MANAGER'S REPORT

ELECTRIC DIVISION

November 2021

Electric Shop and Meters

- Meters. During the month, there were thirty-one (31) meter exchanges/installs:
 - Eight (8) changes from manual meters to RFN (Radio Frequency Node) meters.
 - Four (4) changes from PLC (Power-Line Carrier) meters to RFN meters.
 - Three (3) changes from RR (Radio Read) meters to RFN meter.
 - Two (2) RFN meter exchanges.
 - Two (2) manual meter exchanges.
 - No changes from RFN meters to PLC meters.
 - No changes from PLC meters to RR meters.
 - No changes from RF meters to manual meters.
 - Seven (7) new meter installs.
 - Five (5) meter removals.
- Operations. Investigated, performed troubleshooting, made repairs, performed maintenance and/or installed equipment at KPU facilities:
 - No. 1 Intake level transducer.
 - Mt. Point Substation 34.5kV breaker.
 - Fawn Lake battery charger.
 - Ward Cove substation totalizing meter.
 - Bailey BAG3 speeder motor/governor.
 - Bailey lighting.
 - Ketchikan Powerhouse outage restoration.
 - Whitman Powerhouse outage restoration.
 - Silvis Powerhouse station service transformer.
 - Silvis Substation rebuild auxiliary work.
 - Silvis Powerhouse outage restoration.
 - Beaver Falls outage restoration.
 - Beaver Falls No. 3 governor.
 - Beaver Falls No. 3 brushes.
 - Beaver Falls No. 3 speeder motor.

Continued the metering upgrade for the Yukon system with Eaton/Cooper. Service disconnects and reconnects, system print updates, and station readings.

- SCADA Operations. Investigated, performed troubleshooting, made repairs and/or installed equipment at KPU facilities:
 - OSI Preparation – Networking, Hardware and Logistics.
 - Optical Meter Hardware and Software.
 - System Outage Support.

SCADA file server maintenance, system password verifications, and NTP server configurations. Supported SCADA upgrade meetings. Coordinated and worked with the electric shop on SCADA networks. Continuing training in the SCADA system and PLC's (Programmable Logic Controllers). Records management activities and SCADA upgrade planning.

- Water Department. Investigated and performed troubleshooting for the Chlorination Plant back up generation transfer switch.
- Harbors. Conducted repairs to Bar Harbor float and walkway lights and cleared eleven (11) harbor trouble tickets.
- Telecommunications. Assisted with Telephone Vault No. 11 power issues.

Outages and Events

- On Monday November 22, 2021, at 12:53 AM, an outage affected all electric services in Ketchikan. This outage resulted from a system fault and loss of generation from Southeast Alaska Power Agency (SEAPA) due to a 34.5kV phase-to-phase line fault and SEAPA transformer protective relay trip. All 7,647 KPU customers were affected by the outage. Although power was restored to all customers within three hours and twenty-three minutes (3:23), the total-system generating capacity was not restored until 3:22 PM or fourteen hours and twenty-nine minutes (14:29) from the start of the outage.
- On Wednesday November 24, 2021, at 9:06 AM, an outage affected electric services in Ketchikan caused by a loss of generation from Southeast Alaska Power Agency (SEAPA). KPU and SEAPA operators quickly identified the issue and KPU immediately began power restoration. Initially 3,665 customers were affected by the outage. Within twenty-six minutes (0:26), power was restored to all customers.

Powerhouse & Fleet Maintenance

- Continued a heavy focus on Silvis Powerhouse
- Removed No. 1 Intake trash rack for the season
- Troubleshot Whitman Valve 7 operation issue
- Performed numerous winterization tasks in preparation for the change in season
- Responded to outages to run diesel generators allowing for system restoration
- Fleet maintenance

Regulatory and Dam Safety

- Annual dam safety program training for utility personnel.
- Conducted Emergency Action Plan tabletop exercise for the Whitman Lake Project.
- Annual consultation with fish and wildlife agencies re. the Ketchikan Lakes Hydro Project.

SEAPA

- The next regular board meeting is scheduled for December 10, 2021 in Ketchikan.
- For additional information please visit SEAPA's web site at:
<https://www.seapahydro.org/>

Transmission & Distribution Work

- Rebuilt the Silvis Substation
- Responded to numerous storms event
- Contract 21-04 Utility Tree pruning continued
- Completed installation of six (6) poles at Mile 15.5 North Tongass Hwy; further work requires extended outages to be scheduled in spring 2022



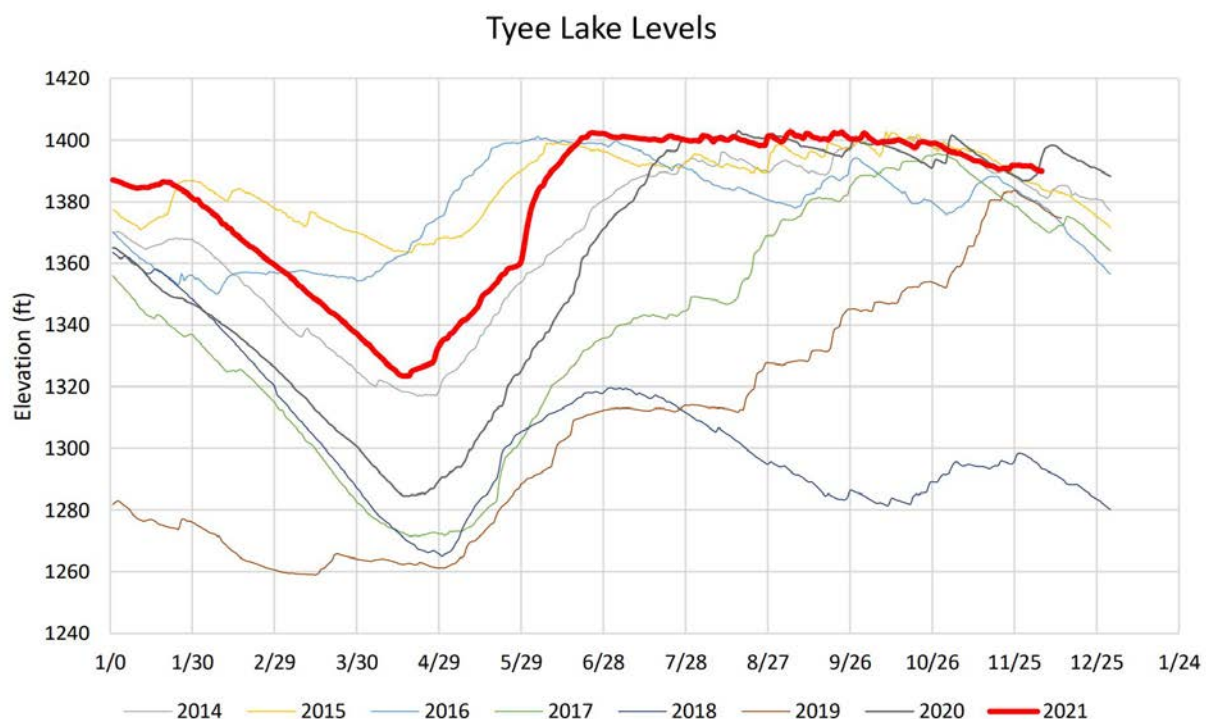
Silvis Substation Rebuild



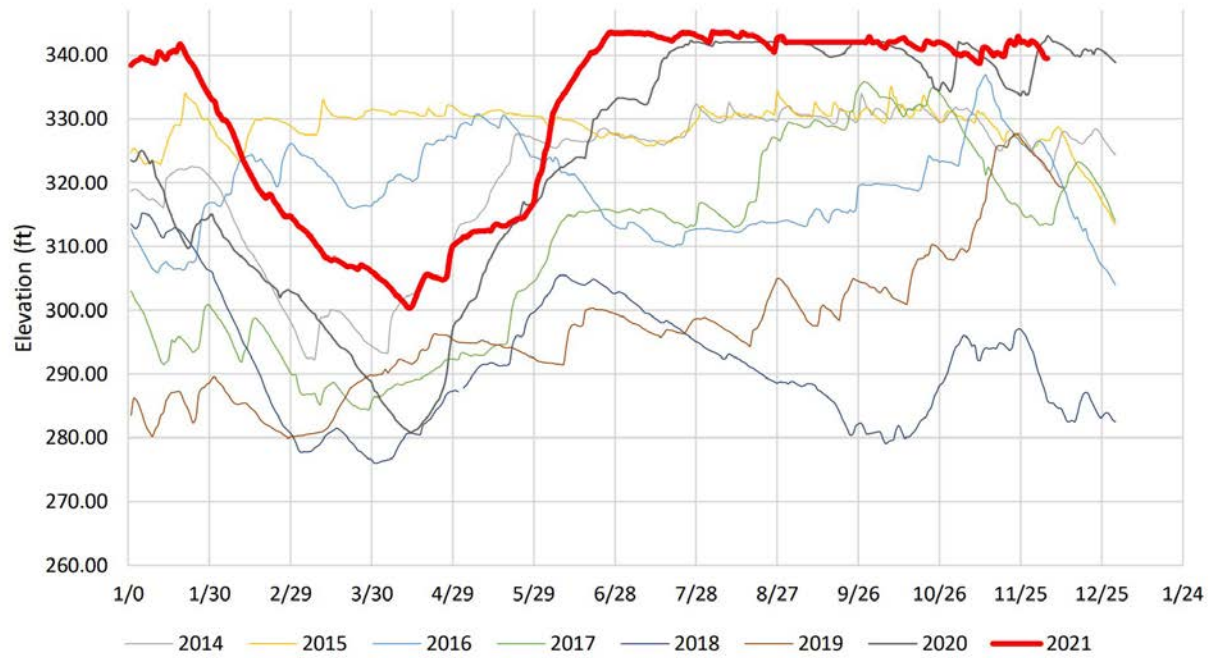
Silvis Substation Rebuild

Water Management/Diesel Supplement

- KPU loads for November were right on average for the month. An average November for Ketchikan is 15.8 GWh. This November the total system load came in at 15.9 GWh.
- Average precipitation for Ketchikan in November runs a little over 17 inches. This November was a wet one with precipitation running from 22 to 34+ inches depending on location. All reservoirs overtopped and spilled this November. One couldn't ask for more water going into the winter months for local generation.
- Local generation for November set another record high at 8.6 GWh. The previous high was 8.2 GWh set last year, 2020.
- Diesel generation for the month was 21.0 GWh, used mainly for outage mitigation. Again, with local hydro generation up, this was among one of the lowest diesel use for a November in Ketchikan.
- Tyee and Swan Lake levels are shown below. All other lake levels and "net" generation are shown in a separate report.



Swan Lake Levels



MANAGER'S REPORT
TELECOMMUNICATIONS DIVISION
November 2021
Operational Issues

TELECOMMUNICATIONS DIVISION MANAGER
Summary

KetchCan1:

November 1, 2021 marked the 1 year anniversary / of cutting the new undersea fiber cable (between Ketchikan and Prince Rupert) into service. During its first 12 months of operation KetchCan1 performed flawlessly. Although the submarine cable's flawless performance continues – on November 14, 2021, southern British Columbia experienced a "100 year storm", complete with torrential rains, flooding, and related infrastructure devastation (including loss of roads, railroad tracks, and related utility rights of way) such that all major terrestrial fiber optic routes in southern BC were destroyed. The net effect of the devastation was loss of approximately 50% of KPU' off island Internet connectivity.

To mitigate the outage, Council approved temporary lease of Internet connectivity from GCI.

The temporary lease expires on December 15, 2021.

In the meantime, 2 of the 3 primary southern BC fiber cable routes remain in a state of ruin, with no near term restoration forecast.

Projected restoration of the third route (along a railroad right-of-way) has a day-to-day more promising forecast (dependent upon the railroad's progress in first rebuilding the railroad tracks, after which cable construction crews can proceed to place and splice replacement cables.

In the meantime, we remain in a state of waiting ... with the possibility of the necessity of extending the lease of temporary capacity from GCI.

Personnel:

I continue to be impressed with the Telecommunications Division's employee work ethic and dedication.

At present, the following positions remain vacant:

1 @ Plant Manager (on 'permanent' hold through the end of 2022).

1 @ Customer Support Specialist ('help desk').

2 @ Combination Technicians ('outside' install repair technicians).

Legislative:

As reported last month, I continue to spend time (and will continue to spend time) working with the Alaska Telecom Association - participating in video meetings in Juneau and DC (with Alaska's Congressional Delegation and staff) - regarding Alaska telecommunications / broadband funding issues which may affect KPUTel indirectly or directly. Approximately 29% of KPUTel's annual

revenue is derived from USF (Federal) and AUSF (State) - and the 'ground' under these programs is always shifting, and requires constant attention - particularly now that proposed federal infrastructure legislation has billions of dollars targeted toward broadband - it is critical to ensure that the Alaska Plan is not altered or threatened via the legislative process.

As noted in copious recent press reports – the “infrastructure package” has passed. Although it appears the bill's related broadband funding (as a practical matter the broadband funding in Alaska probably won't 'hit the streets' until 2024) will be dedicated toward small remote/rural Alaska communities – not Ketchikan.

REGULATORY UPDATE

Summary

The Federal Communications Commission has put out a public notice on the Affordable Connectivity Program (ACP). The ACP is a new program to provide financial support for broadband connectivity to low income households. This program will replace the Emergency Broadband Benefit Program which had limited funding starting in January 2022. The ACP will provide up to \$75 in financial support for broadband/Internet service for qualifying households.

Other regulatory issues of interest are as follows:

On November 5, 2021, the Wireline Competition Bureau paused the phase-out of Lifeline support for voice-only services for one year. As such, the basic Lifeline support of \$5.25 remains available to eligible consumers who subscribe to voice-only service on and after December 1, 2021.

The State of Alaska Governor's Task Force on Broadband released its final report in November. The report adopts metrics which align well with the federal infrastructure bill, including prioritizing unserved (<25/3Mbps) and underserved (<100/20Mbps) locations. The report recognizes that Alaska's networks need a variety of technologies, but also recommends fiber infrastructure where possible because of its performance and scalability. It recommends low latency, affordability, local workforce development, reliability, and scalability. The report also goes into some detail in assigning duties to a new Office of Broadband Deployment which will administer federal infrastructure funding.

TELECOMMUNICATIONS PLANT DEPARTMENT

Summary

Outside Plant Construction and Splicing:

Projects Completed in November 2021

- 2433 1st Ave - design complete.
- 4 additional fibers jobs for construction completed.
- KPU Telecom mobile map for Esri loaded for OSP technicians.
- Water Street Trestle project site survey.
- Site visits and research for easement discrepancies and easement vacancy requests.
- Christmas Tree install.
- Whipple pole transfer.
- Ward Cove Admin building terminal migration.

- Mud Bight terminal installation.
- Woodsides MDU project conduit paths in-progress for remaining buildings.
- This month we had to repair several low-hanging lines due to windy conditions.

Installation and Repair:

- The installation and repair crews completed:
 - 77 service orders
 - 73 trouble tickets
 - 31 fiber drops

2021	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
SO	62	68	47	65	75	72	73	74	64	70	77
TT	110	93	98	74	72	105	102	100	89	87	73
FD	29	12	15	9	18	22	31	20	20	20	31
Total	201	173	160	148	165	199	206	194	173	177	181

OSP Installation & Repair Scorecard: Nov. 2021	SO	TT	FD
Employee			
Brad C.	1	3	0
Ryan J.	36	5	17
Roger M.	0	0	0
Alan M.	4	53	0
Nate L.	0	0	0
Von D.	0	0	0
Lee C.	0	2	8
Jared A.	0	0	0
Mike P.	0	0	0
Jeremy M.	0	1	0
Zach S.	36	9	6
Sven W.	0	0	0
Total	64	89	20

Safety:

We have resumed safety meetings with the ESCI instructor. Moving forward for 2022, the Telecommunications Department plans on having quarterly safety meetings with the ESCI instructor, and monthly department meetings in between the scheduled quarterly safety meetings.

TELECOMMUNICATIONS ENGINEERING DEPARTMENT

Summary

Engineering:

- 4G/LTE
 - Verizon KPI's good for the month of November.
 - Skagway to Haines Verizon peering completed.
 - High Mountain transmit Antenna realignment planned.
- IP Engineering
 - CO network redesign project ongoing.
 - Security improvements via access-lists implementation in-progress.
 - Project ongoing to add new /19 ipv4 subnet to KPU's public allocation.
 - KGB L3 network design migration 90% complete.
 - Adtran Device Manager and network performance unit upgrade complete.
- Video Engineering
 - Ongoing removal of remaining 150/550 STBs to complete Minerva M10 upgrade.
 - Castus Server upgrade complete.
 - New Cowboy channel, Ch 1182.
 - City Council WebEx broadcast migration to Council Chambers.
- Voice Engineering
 - Broadworks vSAN software upgrade completed.
 - KPULD running over new ClearIP for Stir/Shaken for SIP and TDM.
 - Completed and resolved issues relative to 10-Digit Dialing mandate.
- Systems Engineering
 - Windows AD domain migration project in-progress for MFA.
 - DNS re-architecture in-progress with SCN research.
 - Extrahop software upgraded to 8.6.3.
 - Security access-list updates to address several vulnerabilities.
 - CSS assistance on pivot reports.
- Facilities
 - 3 additional Zhone MALC switches retired.
 - New Adtran cabinet for Ward Cove in-progress.
 - Battery replacement completed at Forest Park.

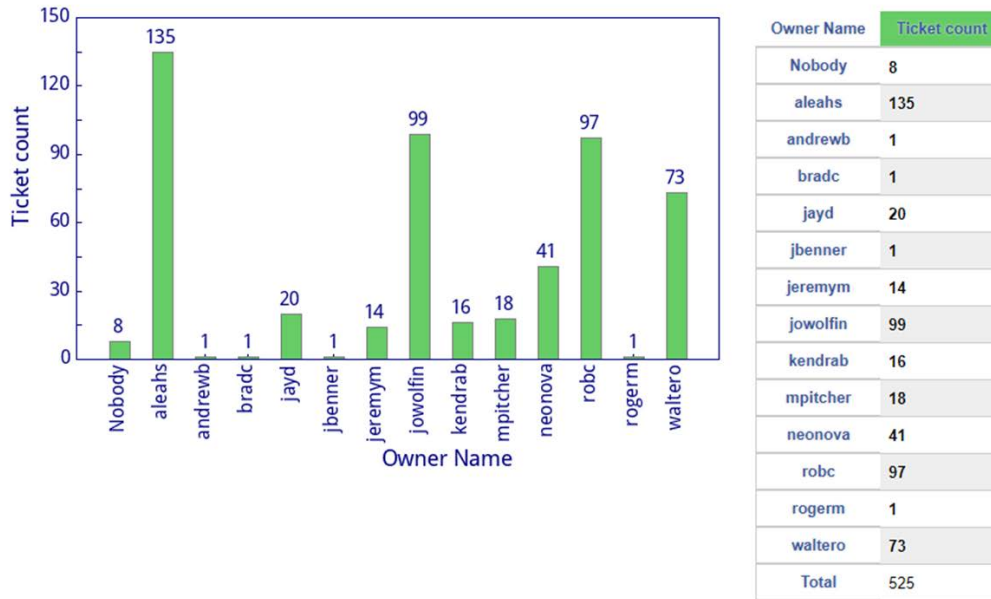
Service Delivery & Network Operations:

- 71 Resolved PBX tickets.
- 6 Service Orders.
- 1 Fiber Upgrade.
- 1 Switch Upgrade.
- 2 Special Circuit Orders.
- 1 Hosted migration.
- 1 New managed router install.
- 1 IPTV site survey for 29 STBs.

CSS Overview:

Total CSS Calls:

- Calls to Customer Support in November 2021
 - Total Calls to 225-2111 = 493
 - Calls forwarded to NeoNova 984-244-5721 = 266
 - Calls Answered by Customer Support = 227



Query: Status != 'SPAM' AND Status != 'rejected' AND Queue != 'OSP' AND Queue != 'CompHQ' AND Queue != 'CustomerService' AND Queue != 'MSM' AND Queue != 'Maintenance' AND Queue != 'BattRepl' AND Queue != 'Support_Level3' AND Queue != 'Billing' AND Queue != 'CustAtRisk' AND Queue != 'TESTT2' AND Queue != 'Support_Level2' AND Resolved < '2021-11-30' AND Resolved > '2021-11-01'

Users



**MANAGER'S REPORT
WATER DIVISION
November 2021**

FILTRATION AVOIDANCE

At their meeting of May 20, 2021 the City Council approved the draft Compliance Order by Consent (COBC) prepared by the Alaska Department of Environmental Conservation (ADEC). It contains provisions that KPU must demonstrate in order to qualify for a Limited Alternative to Filtration (LAF). They are:

- a. The system has “uninhabited, undeveloped watersheds in consolidated ownership.”
- b. The system has control over both “access to, and activities in, those watersheds.”
- c. The system’s source water quality and the alternative treatment requirements established by the state must ensure greater removal or inactivation efficiencies of pathogens than would otherwise result from the treatment requirements stipulated by regulations.

Jacobs Engineering’s proposal for an amendment to their existing Contract 19-44 for professional services supporting Ketchikan attaining a LAF was approved by the City Council. Their proposal summarized the necessary documentation needed to meet the requirements of four of the tasks that are described in the COBC. They include preparations of a Watershed Control Program, a Source Water Control Study, the Provisions for Public Involvement in the COBC as set out by the EPA, and a report demonstrating how Ketchikan’s present disinfection process already exceeds the requirements of national drinking water regulations. The fifth task, Consolidated Ownership Status of the Watershed, was felt to be entirely a legal matter and best handled by the municipal attorney with support as needed provided by Perkins-Coie, a legal firm who are already familiar with the consolidated property ownership that has been questioned earlier by the EPA.

Ketchikan’s long-sought issuance of a LAF will depend on submittal of these studies and reports to demonstrate that each of the five Action Items listed in the ADEC’s draft COBC have been met. Ketchikan’s Source Water Quality Study is a critical Action Item component which, at the request of ADEC, will continue reporting the results of raw water fecal colony sampling throughout the remainder of 2021.

EPA regulations require that, on a 6-month running average, at least 90% of the raw water samples that are collected must contain 20 fecal coliform colonies or less. Any failure on Ketchikan’s part to meet the EPA’s 90% raw water fecal coliform limit would have created an almost insurmountable situation that could have cancelled any possibility of a LAF. Although raw water fecal colonies are always the highest during the fall months while migratory waterfowl are passing through our watershed, the additional bird deterrents installed over the grassy flats around Fawn Lake by KPU personnel successfully kept them flying southward. Despite a few high raw water coliform results occurring in September and October, no further samples exceeded EPA permissible limits during November. As a result, Ketchikan remained in compliance with EPA requirements with a running 6-month average of 95.0%.

Jacobs Engineering has prepared a draft report containing all of the Action Items’ studies and reports that were identified in the COBC requirements. Only December’s raw water fecal colony results are still outstanding. Once those are received, the entire final document will be prepared and delivered to ADEC well before the COBC document specified date of May 31, 2022.

DISINFECTION BYPRODUCTS SAMPLING

When the EPA's Stage 2 Disinfection Byproducts Rule (Stage 2 DBP Rule) went into effect in October 2013, the required DBP sample points changed. The month that the samples must be collected is now specified and KPU can no longer average the results over the entire distribution system. Instead each sample point (identified as Sites 5 and 8 on the attached Table I) must stand on its own merits and when averaged over the mandatory February, May, August, & November samples, these become the official results that are measured for compliance and must unequivocally be below a 60 parts per billion (ppb) average for haloacetic acids (HAA5) and 80 ppb for total trihalomethanes (TTHM). Compliance with the Stage 2 DBP Rule is determined by the locational running annual average (LRAA) of the previous four quarterly samples from each site.

Beginning in June 2016, by reducing the amount of chlorine at the Chlorination Plant, then adding just enough chlorine at the Two-Point Facility to form monochloramine after adding ammonia has had the effect of almost completely quenching further formation of haloacetic acids within the distribution system. In addition, after the higher than expected HAA5 results occurred in August 2020, KPU has continued to take extra care to ensure the effect of a reduced initial chlorine residual set point was thoroughly distributed throughout the water system before collecting August's samples for HAA5 analysis. As a result, for the past 4 years Ketchikan has remained in compliance with the Stage 2 DBP Rule for both haloacetic acids and total trihalomethanes.

By maintaining the chlorine residual set point at 0.3 - 0.4 milligrams/ liter and as low as practical during the month of November, the quarterly haloacetic acids (HAA5s) results for both Sites 5 & 8 continued to be some of the lowest ever measured for this month. As illustrated in Table I, the analytical results were 41.2 ppb and 46.6 ppb, respectively. The present LRAA for haloacetic acids at Site 5 is 41.2 ppb and for Site 8, 36.4 ppb which continues the LRAA within the same EPA allowable range that it has been since May 2017. While not part of the EPA regulatory requirements, KPU also samples the disinfected water leaving the Bear Valley Reservoir before it enters the municipal distribution system for our own information. At 45.5 ppb, it too is in the same range.

OPERATIONAL ISSUES

Contract 21-01 - Ketchikan Raw Water Transmission Main Replacement

DOWL Engineers, who have already completed the earlier design work for the replacement for Schoenbar Road's distribution water and wastewater mains have designed a replacement for the failing portion of the 36-inch raw water transmission main in Schoenbar Road. It will be a single, permanent 42-inch HDPE pipeline to be located between the southwesterly edge of Norman Walker Field (adjacent to Park Avenue parking area), and the Ketchikan Charter School. Beginning at the westerly edge of Norman Walker Field, it will cross above Schoenbar Creek adjacent to where Schoenbar Creek's 96-inch multi-plate culvert begins, and then remain buried under Schoenbar Middle School's driveway, passing beneath the School District's Maintenance Shop parking area and the Ketchikan Charter School's playground before reconnecting to the remainder of the existing raw water transmission main.

DOWL's design is complete and has been approved by ADEC for its construction. After advertisement and receipt of bids, Contract 21-01 was awarded to BAM Construction by the City Council at their meeting of October 7th. The contract has been fully executed, and notice to proceed was issued to BAM on October 25th. Submittals for the necessary construction materials are being received from BAM and after their approval, their orders for materials are being placed. Just like the

long-delivery valves and other items ordered earlier in 2020 by KPU in anticipation of providing those with Contract 21-01, a number of items being ordered by BAM will also have long-delivery times. Once their material's estimated delivery dates are received, BAM will prepare a construction schedule. It will likely begin with the difficult installation of the two 42-inch HDPE connection points and probably not start before early 2022. In addition to the two massive reconnection points to be made to the existing 36-inch raw water ductile iron transmission main, this project includes the installation of 1670-feet of 42-inch HDPE pipe weighing about 200 pounds/ foot in a trench that will be about 10-feet deep. This will be a massive undertaking by the contractor and is not likely to be completed until 2023.

Further complicating this difficult project, in July 2021, our former Utilities Inspector tendered his resignation and thus far, we have been unable to hire a qualified replacement for this position. Consequently, once BAM Construction begins installation of the new 42-inch HDPE pipeline in early 2022 and until a replacement Utility Inspector is hired, it will be necessary for other members of the Water Division staff to provide the critical daily construction inspection services in addition to their usual customary operating and maintenance duties.

Contract 20-25 – Continuation of Water Meter Design / Build – Business & Commercial Customers

Ketchikan Mechanical Inc. (KMI) was awarded Contract 20-25, the installation of another 50 water meters using the same design-build contract method as before, by the City Council on February 4th. KMI's first task is to conduct individual audits of each of the businesses that were identified in the Bid Documents and from these audits, then prepares a simplified design for each individual meter installation for review and approval by KPU. After KPU's approval is issued, the contractor begins installation of the new meter. Since its inception in 2019, this step-by-step method of installing water meters has proven to be entirely satisfactory for everyone involved.

Like so many other manufactured items affected by the coronavirus pandemic this inadvertent delay required an extension to KMI's Contract 20-25's completion date to October 9th and was approved by the City Council at their meeting of July 1st. As before, this contract was completed on-time and under budget. With a total of 183 meters now installed, it is apparent that using the design/ build concept for meter installation has been both cost-efficient and successful, with minimal difficulties encountered. Issuance of a contract in early 2022 is planned to install meters in the remainder of the approximately 225 unmetered businesses, commercial buildings, and large residential apartment complexes.

KPU's supply of Cooper Power nodes remaining in inventory is exhausted. Until these new nodes arrive and are installed by KPU employees, most of the 50 new water meters that KMI has installed in this contract won't become fully functional and begin reporting. The reporting procedure itself consists of each node interrogating its associated water meter hourly and reporting the results to one of KPU's nearby Cooper Power "smart" electric meters which then in turn transmits the water flow measurements to the Electric Division. Ultimately, this water consumption information will be transmitted to Finance's New World Financial Management System for the purpose of preparing monthly billings to our ratepayers.

Complicating the matter, the 80 additional nodes that were ordered back in October 2020 continues to experience further delays in their estimated delivery date. Cooper Power's management has stated that the manufacturing problems have finally been resolved and the factory will begin node production after the Holidays. Cooper Power's latest estimate is that at least the 80 nodes ordered in 2020 should be available for shipment beginning in March, 2022 with the possibility of

simultaneously shipping the additional 160 nodes that KPU had ordered in February and March, 2021. Once received and installed, the remainder of Contract 20-25's meters that are now lacking nodes will begin reporting their daily water consumption. The additional nodes received will be placed in inventory and ready to install while the remainder of the unmetered businesses, commercial buildings, and large residential apartment complexes are receiving their individual water meters in the next meter contract.

Achieving the goal of having all of these business and commercial buildings and large residential apartment complexes fully metered before the end of 2022 will still require continued significant effort as there are still approximately 225 unmetered businesses, commercial buildings, and large residential apartment complexes remaining. In addition, the 2016 Water/ Wastewater Rate Study will need to be updated as well as amendments made to the Ketchikan Municipal Code.

Contract No. 21-10 – Programmable Logic Controller Upgrade – Phase II - UV Disinfection Facility

Although Jacobs Engineering has completed earlier Contracts which made the initial upgrades to our SCADA server and program software, there still remain a number of outstanding automation and cybersecurity risks existing within the disinfection system that also need to be addressed. Contract 21-03 – Water Cyber Security Evaluation was recently completed and identified areas in urgent need of cybersecurity improvements including the planned multi-year project to replace all three of our present Allen-Bradley Programmable Logic Controllers (PLCs) which have reached the end of their useful service life. Collectively, KPU has three Allen-Bradley Programmable Logic Controllers (PLCs) installed at the UV Facility, the Chlorination Plant, and the Ammonia Addition Facility. They are each providing continuous supervisory control over specific critical components within KPU's complex, computer-controlled, disinfection process.

Although this project had been approved for construction in the division's 2020 CIP program, by that March everyone suddenly found themselves in the midst of the worldwide coronavirus pandemic and all that entailed. Accordingly, to minimize the Utilities' annual operating expenditures during 2020, KPU elected to defer any planned PLC upgrading until 2021. Included in Water's 2021 CIP Budget, Contract 21-10 will be the first phase of this project and was approved by the City Council at their meeting of July 15th. The PLC replacements will be the new Allen-Bradley ControlLogix PLCs which have long-term manufacturer and industry support. They use a modern control system infrastructure that offers several improvements for communications, stability, ease of maintenance, and reliability. This is the reason when the Two-Point Chlorination Facility was being designed in 2015, the latest ControlLogix PLC's were chosen instead to operate the two new ClorTec sodium hypochlorite generators.

It will be followed in 2023 by replacing the PLC located at the Old Chlorination Building (CP-300), and replace the third and final PLC at the Ammonia Building (CP-400) in 2026. This will allow all these critical PLC's to migrate to the modern Allen-Bradley ControlLogix PLC platform while spreading the expenditure over several years.

TABLE I

HALOACETIC ACID & TOTAL TRIHALOMETHANE ANALYSIS
STAGE 2 DISINFECTION & DISINFECTION BYPRODUCTS RULE

DATE	No. 2 Fire Station 3352 Tongass Ave. (Site 8 - High TTHM)		Buren & Bailey Boulevard (Site 5 - High HAA5)		Bear Valley Reservoir Special Purpose Samples	
	HAA5 formation, ppb	TTHM formation, ppb	HAA5 formation, ppb	TTHM formation, ppb	HAA5 formation, ppb	TTHM formation, ppb
8 April 2014	Chloramination Disinfection Begins					
14 June 2016	Two-Point Chlorination Begins					
January 2020	Chlorine Residual Setpoint Reduced from 0.7 to 0.4 mg/L					
1 Feb. 2021	33.3	21.0	33	22.0	26	15.9
10 May. 2021	40.4	24.8	44.5	28.9	34.7	21.8
2 Aug. 2021	25.2	30.2	45.9	30.0	29	26.1
1 Nov. 2021	46.6	37.2	41.2	34.2	45.5	37.2
Four Quarter Running Annual Average at Individual Sites	36.4	28.3	41.2	28.8	33.8	25.3

First Quarter Sample

Second Quarter Sample

Third Quarter Sample

Fourth Quarter Sample