Ketchikan Public Utilities
2018 Annual Water Quality Report

Public Water System 2120232
2930 Tongass Avenue
Ketchikan, AK 99901

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Ketchikan Public Utilities (KPU) believes it is important to help our customers become better informed about where their drinking water comes from, what is involved in the delivery of safe drinking water, and the importance of source water protection at Ketchikan Lakes. We are pleased to present this, our eighteenth report, for the period between January and December 2018.

This report contains important information about your drinking water. For the benefit of those non-English speaking Ketchikan residents, please have the report translated, or speak with someone who understands it. In Tagalog; Mahalaga ang impormasyong ito. Mangyaring ipasalin ito. In Spanish; Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Ketchikan enjoys one of the purest and most plentiful supplies of drinking water in the world. Nevertheless, many of us who once gave no thought to the water that comes from our faucets are now asking the same question; "Is my water safe to drink?" Our answer remains: Yes, it is!

Why am I receiving this report?
Congress passed the Safe Drinking Water Act in 1974 in response to nationwide concern about the safety of public drinking water supplies. The Environmental Protection Agency (EPA) was authorized to establish minimum standards and requirements for all public water suppliers. Continuing legislation since that time has included the requirement that consumers of water (including those with special health needs) be provided with information, which will allow them to make informed decisions regarding their drinking water.

What if I have questions about my water?
Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

For more information about your drinking water, please call John Kleinegger, KPU's Water Division Manager, at 228-2441. Also, you are welcome and encouraged to attend public meetings of the Ketchikan City Council. They meet on the first and third Thursdays of every month at 7:00 pm in the City Hall's Council Chambers located at 334 Front Street.

Copies of the annual 2018 Onsite Watershed Inspection Report conducted by the Alaska Department of Environmental Conservation (ADEC), the 2016 sanitary survey of the entire

municipal water system conducted by the Alaska Rural Water Association, as well as our source water assessment completed in September 2003 are all available upon request to KPU.

Where does our water come from?
The Ketchikan Lakes water supply includes over 11 square miles of watershed consisting of the drainage area surrounding Ketchikan Lakes and Granite Creek. These two drainage basins feed Fawn Lake through a series of tunnels and penstocks. Leaving Fawn Lake, another series of tunnels then conducts water down to the intake of the water system located on Fair Street across from the City Park. There, the raw surface water begins the disinfection process when thoroughly mixed with chlorine. It then travels a mile along Schoenbar Road to the Ultraviolet Light (UV) Disinfection Facility for additional disinfection. From the UV Facility, an additional amount of chlorine is added to mix with a small amount of ammonium hydroxide injected just before water enters the Bear Valley Reservoir. Within the 3-million gallon reservoir, ammonia combines with the unreacted chlorine to form the final chloramine disinfectant and distributed throughout Ketchikan's municipal water system. Chloramine disinfection began on April 8, 2014 and is now further enhanced with secondary chlorine injection that began on June 14, 2016. Our use of dual disinfectants with extra disinfection time are necessary to ensure that any viruses, bacteria, or any other pathogens that may have been present in the raw water are completely destroyed before ever entering your drinking water.

What contaminants might be in our water?
As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in our source water include:

A) Microbial contaminants, such as viruses and bacteria, which may come from wildlife and human activity.
B) Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from storm water runoff.
C) Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes, and can also come from storm water runoff.

Are there contaminants in Ketchikan's water?
As required by ADEC, we send water samples every year to independent, certified laboratories for analysis using the latest, modern equipment. When tested in 2001, all of the regulated inorganic contaminants were at or below the minimum detectable limits (MDL) of the analytical equipment. Since then, equipment accuracy has increased greatly and, when our water was tested again in 2011, only minute amounts of barium, chromium, and thallium were found present. All of the other inorganic contaminants still remained below the MDL. Note also that the amounts of barium, chromium, and thallium that are present are all well below the EPA maximum allowable levels (MCL) for these contaminants. The next set of inorganic analyses is not due until after 2019.

As an unfiltered water system, we are required to monitor our turbidity continuously. Turbidity is a measure of the cloudiness of the water and we test for it because it is an indicator of microbiological quality. The standard allowable raw water turbidity for an unfiltered water system like Ketchikan's is 5 Nephelometric Turbidity Units (NTU's). The normal turbidity levels in our raw water supply from Ketchikan Lakes generally ranges between 0.2 - 1.0 NTU

although there were occasional turbidity excursions in 2018 above 1.0 NTU but less than 5 NTU's caused by heavy rainfall. These sudden raw water turbidity increases occur primarily in the Granite Basin portion of our watershed not only during the typical Southeast Alaska fall storms that occur every year, but also during periods of heavy rainfall following a dry spell. We have procedures in place to divert the raw water being supplied by Granite Basin Creek during these periods which minimizes the turbidity increase. The incoming chlorine residual may also be increased. Ketchikan Lakes also supplies the Ketchikan Power House hydrogenerators which may be sped up to help flush out the increased turbidity. These approaches allow the total amount of chlorine entering the municipal distribution system as chloramines to be sustained and adequate disinfection is maintained throughout. In addition, further disinfection is provided by the Ultraviolet (UV) Disinfection Facility which remains in continuous operation. Raw and treated water samples are collected that same day for laboratory coliform analysis. In each case, there were **zero (0)** coliform bacteria colonies found in the disinfected, treated water samples. The net result was that the municipal water system remained fully and safely disinfected at all times.

Volatile organic contaminants are also found. These are created when the naturally occurring organics are produced during the wood decay process and are carried by rainfall runoff into the Ketchikan Lakes. As expected, the greatest amount of these HAA5's and TTHM's occurs during the warmer and drier summer months when Ketchikan Lakes warms up and the amount of dissolved organics in the water increases. Both Total Trihalomethanes (TTHM's) and haloacetic acids (HAA5) are created as disinfection byproducts when naturally occurring organic matter combines with the chlorine disinfectant added to kill microorganisms. The maximum contaminant level (MCL) for HAA5's is 60 parts per billion (ppb) and for TTHM's, it is 80 ppb.

The EPA's Stage 2 Disinfection Byproducts Rule (Stage 2 DBPR) that went into effect in 2014 requires sampling only at the two worst-case scenarios within the distribution system and just at specific months. Ketchikan began disinfecting with chloramines instead of chlorine on April 8, 2014 which substantially reduced the previously high amounts of haloacetic acids present. This was further enhanced on June 14, 2016 after installing additional equipment to begin a two-part program of reducing the amount of chorine disinfectant injected at the primary site followed by minimal secondary chorine injected downstream of the UV Disinfection Facility.

The 2018 running quarterly average HAA5 results at those two worst-case sites at the four specific months were 41.9 ppb and 45.1 ppb respectively. Similarly, the TTHM's 2018 overall running average, expressed at the same Stage 2 DBPR averaged quarterly basis, found both sites were averaging 29.4 and 29.7 ppb respectively; which is well below the 80 ppb MCL.

Ketchikan is now in compliance with all Federal drinking water standards.

Is our water safe for everyone?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

In the Table below, you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Non-Detects (ND) - laboratory analysis indicates that the contaminant is not present.
Parts per million (ppm) or Milligrams per liter (mg/l) – corresponds to one part per million parts. For ease of comparison, a ppm is equal to one minute in 2 years or 1 penny in $10,000 dollars.
Parts per billion (ppb) or Micrograms per liter – corresponds to one part per billion parts. A part per billion (ppb) is equal to one minute in 2,000 years or 1 penny in $10-million dollars.
Parts per trillion (PPT) – corresponds to one part per trillion parts. A part per trillion (PPT) is equal to one minute in 200,000 years or 1 penny in $10-billion dollars
Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
Action Level - the concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.
Treatment Technique (TT) - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
Maximum Contaminant Level - The "Maximum Allowed" (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
Maximum Contaminant Level Goal - The "Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
Maximum Residual Disinfectant Level (MRDL) – The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG) – The level of a drinking water disinfectant below which there is no known or expected risk to health. *MRDLGs* do not reflect the benefits of the use of disinfectants to control microbial contaminants.

TEST RESULTS						
Contaminant	MCL Violation	Level Detected	Unit Measurement	MCLG	MCL	Likely source of contamination to the best of our present knowledge
Microbiological Contaminants						
Turbidity (2018) Note (1)	No	3.86	NTU	n/a	5	Soil runoff
Note (1) turbidity is a measure of the cloudiness of the water. We test it because it is an indicator of microbiological quality.						
Chemical Contaminants						
Chloramines (2018) Note (2)	No	2.10	ppm	MRDLG=4	MRDL=4	Water additive used to control microbes
Note (2) The 12 or more distribution samples that are collected monthly throughout the community to confirm zero (0) coliform colonies are present also include the Chloramine disinfectant residual. It generally runs around 1.90 ppm. Occasional samples may be 1.0 ppm or less and none exceeded 2.10 ppm.						

Inorganic Contaminants						
Copper (2018) Note (3) 90th percentile reporting	No	0.200	ppm	1.3	AL= 1.3	Corrosion of household plumbing
Lead (2018) Note (4) 90th percentile reporting	No	4.80	ppb	zero	AL= 15	Corrosion of household plumbing
Note (3) None of the twenty samples exceeded the current action level of 1.3 ppm. Next test cycle is due in 2021.						
Note (4) None of the twenty samples exceeded the current action level of 15 ppb. Next test cycle is due in 2021.						
Volatile Organic Contaminants						
TTHM (Total Trihalomethanes) (2018) Note (5)	No	29.4 & 29.7	ppb	n/a	80	By-product of water chlorination
HAA5 Haloacetic Acids (2018) Note (6)	No	41.9 & 45.1	ppb	n/a	60	By-product of water chlorination
Note (5) In 2018, a total of eight samples were taken at two specific distribution sites. The TTHM individual analytical results ranged between 19.9 and 48.7 ppb.						
Note (6) In 2018, a total of eight samples were taken at two specific distribution sites. The HAA5 individual analytical results ranged between 32 and 53.2 ppb.						

Disinfection Byproducts (DBP) Contaminants:

The Long Term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfectants/ Disinfection Byproducts Rule (Stage 2 DBPR) placed additional responsibility upon Ketchikan to meet these increased water quality requirements in order to remain as an unfiltered system. On April 8, 2014, chlorine and ultraviolet light (UV) began to be used as dual disinfectants followed by ammonia injection to create chloramines to reduce the formation of disinfection byproducts. Although chloramination reduced the amount of haloacetic acids being created by about half, it was still not enough. Earlier full-scale testing had demonstrated that the creation of haloacetic acids could be further reduced by lowering the amount of chlorine added at the Chlorination Plant while adding the just the remainder needed for chloramine formation downstream of the UV reactors and just before the Bear Valley Reservoir. The necessary equipment was installed and the Two-Point Chlorination Facility became fully operational on June 14, 2016. Under the Stage 2 DBP Rule, compliance is based on the locational running annual average (LRAA) of previous four quarterly samples from each site. Including both the recent February and May 2019's results into the running four quarter computation, the LRAA for haloacetic acids at the two specifically selected sites is now 41.4 ppb and 45.7 ppb. Both of these sites continue to average below the EPA's 60 ppb maximum contaminant level (MCL) for haloacetic acids.

For the past 2½ years Ketchikan has remained in compliance with the Stage 2 DBP Rule for both haloacetic acids and total trihalomethanes.

Monitoring Waivers:

ADEC granted Statewide Use Waivers in 1994 for Asbestos and Dioxin and a Waiver by Rule was issued for Cyanide. They also granted a Susceptibility Waiver for Synthetic Organic Chemicals (SOC) after 1993 sampling; all of which were below the detection limit of the analytical equipment. This Waiver has continued to be granted and was most recently reapproved for the 2017-2019 period.

Concerning radioactivity in our water:
Samples of Ketchikan's water are collected for analysis by an independent laboratory to determine if our water contains any radioactive isotopes. In the 2016 and 2005 samples, the emitted alpha and beta particles from these regulated element isotopes were found to be either at or below the minimum detectable threshold of the laboratory's analytical equipment. Similarly negative results occurred in 2001 when our water was tested only for radon. The next set of samples is due to be taken between 2017 and 2025.

Concerning lead in our water:
If present, elevated levels of lead can cause serious health problems especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. KPU is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30-seconds to 2-minutes before using the water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at http://www.epa.gov/safewater/lead.

The EPA requires lead and copper samples to be collected every 3 years during the summer months from twenty residences constructed during the final years when lead soldered plumbing was legal. 2018's samples were the last taken and the results are reported in Table I above. The next set of samples will be taken during the summer of 2021. As far as the water delivered from KPU's water mains is concerned, it has always been much less than the EPA's lead MCL. Three samples that were collected in 2008 from KPU's water mains ranged between 0.50 and 0.71 ppb lead.

Concerning arsenic in our water:
Nationwide, there was significant discussion during 2002 concerning the amount of arsenic permissible in drinking water and the Maximum Contaminant Level (MCL) was lowered by the EPA from 50 ppb to 10 ppb. Ketchikan's arsenic level has been tested for years by independent laboratories, most recently in 2012 and was not detected even at the 1 ppb level. With Ketchikan's consistently low arsenic results, the next sample analysis is not due until after 2019.

Concerning per- and polyfluoroalkyl substances (PFAS):
Nationwide, more and more concern is being expressed about the increasing problem of PFAS contamination of groundwater supplies through the earlier US manufacture of heat-resistant, non-stick coatings and their continued usage in fire-fighting foams. Although it is not enforceable as a mandate, in 2016 the EPA released a **70 parts per trillion (PPT)** lifetime health advisory guidance for combined PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonic acid) exposure. In addition to PFOA and PFOS compounds, there are three other common PFAS with similar abbreviations also appearing in literature. All are heat-resistant, able to repel water, and close to indestructible. States are beginning to set their own regulations as they criticize the EPA for moving too slowly. As an example, Vermont has just adopted a cumulative limit of **20 PPT** for all five of these PFAS. KPU has collected samples of our potable water as it enters our distribution system and sent them off for analysis of all five of the common PFAS. We have every reason to expect the results will be non-detectable and will advise you of the results once they are known.