

**Ketchikan Public Utilities
2017 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 seventeenth report, for the period between January and December 2017.

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?” Despite the presence of a particular group of disinfectant byproducts (discussed in greater detail on page 3 of this report) that are higher than EPA standards, 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 2017 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, 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 2017 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 chlorine disinfectant injected at the primary site followed by minimal secondary chlorine injected downstream of the UV Disinfection Facility.

The 2017 running quarterly average results HAA5 results at those two worst-case sites for those four specific months were 45.5 ppb and 49.1 ppb respectively. Similarly, the TTHM's 2017 overall running average, expressed at the same Stage 2 DBPR averaged quarterly basis, found both sites were averaging the same 29.5 ppb; which is well below the 80 ppb MCL.

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

The risk of disease for drinking water that is not disinfected is much more immediate than that of getting cancer for drinking water over many years containing disinfection byproducts. People who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. The U. S Environmental Protection Agency (EPA) defines this additional increased risk as statistically greater than 1 extra chance in 10,000 and less than 1 chance in 1,000,000. This information is published by the EPA, Risk Assessment Forum, Guidelines for Carcinogen Risk Assessment, Washington DC, p.1-17.

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, illustrations of just how small a part per million (ppm) is are the following examples; a ppm is equal to one minute in 2 years or 1 penny in \$10-thousand dollars.

Parts per billion (ppb) or Micrograms per liter – corresponds to one part per billion parts. Similarly, illustrations of just how small is a part per billion (ppb) are the following examples; a ppb is equal to one minute in 2000 years or 1 penny in \$10-million 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.

TEST RESULTS						
Contaminant	MCL Violation	Level Detected	Unit Measurement	MCL G	MC L	Likely source of contamination to the best of our present knowledge
Microbiological Contaminants						
Turbidity (2017) Note (1)	No	2.15	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.						

Inorganic Contaminants							
Copper (2015) 90 th percentile reporting	Note (2)	No	0.266	ppm	1.3	AL= 1.3	Corrosion of household plumbing
Lead (2015) 90 th percentile reporting	Note (3)	No	8.14	ppb	zero	AL= 15	Corrosion of household plumbing
Note (2) None of the twenty samples exceeded the current action level of 1.3 ppm. Next test cycle is due in 2018.							
Note (3) One of the twenty samples exceeded the current action level of 15 ppb due to incorrect sample collection. Next test cycle is due in 2018.							
Volatile Organic Contaminants							
TTHM (Total Trihalomethanes) (2017) Note (4)	No		29.5 & 29.5 ppb	n/a	80		By-product of water chlorination
HAA5 Haloacetic Acids (2017) Note (5)	No		45.5 & 49.1 ppb	n/a	60		By-product of water chlorination
Note (4) In 2017, a total of eight samples were taken at two specific distribution sites. The TTHM individual analytical results ranged between 21.9 and 45.7 ppb.							
Note (5) In 2017, a total of eight samples were taken at two specific distribution sites. The HAA5 individual analytical results ranged between 35 and 67.7 ppb.							

Disinfection Byproducts (DBP) Contaminants:

Beginning in 2014, 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 for Ketchikan to remain consistently below the 60 parts per billion (ppb) maximum contaminant level (MCL) of disinfection byproducts collectively identified as five different haloacetic acids (HAA5).

As reported in prior Consumer Confidence Reports, since 2003 KPU has been working with CH2M Hill, a nationally known engineering firm, to develop an optimum solution that will reduce the amount of haloacetic acids present and bring Ketchikan into compliance with the EPA regulations. Beginning in 2013, extensive full-scale testing demonstrated that the creation of haloacetic acids can be reduced by lowering the amount of chlorine added at the Chlorination Plant while adding the remainder needed for chloramine formation downstream of the UV reactors and just before the Bear Valley Reservoir. The design of this new facility was quickly completed by CH2M Hill early in 2015. After design review and approval by ADEC, the construction contract was advertised for bid and awarded to BAM LLC. Construction began immediately and the 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 the recent February and May 2018's results into the running four quarter computation, the LRAA for haloacetic acids at the two specifically selected sites is now 44.5 ppb and 47.5 ppb. Both of these sites are continuing to average below the EPA's MCL for haloacetic acids of 60 ppb.

For the past 1½ years Ketchikan has remained in compliance with the Stage 2 DBP Rule for both haloacetic acids and total trihalomethanes.

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. 2015's samples were the last taken and the results are reported in Table I above. The next set of samples will be taken during 2018's summer. 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 pH and NDMA content of our water:

The EPA has established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for 15 contaminants including pH. EPA does not enforce these "secondary maximum contaminant levels" (SMCLs) and for pH the SMCL guideline range is from 6.5 to 8.5 pH units and are not considered to present a risk to human health at the SMCL. Ketchikan's drinking water averages 7.8 pH and can range between 7.3 to 8.2 pH. It has remained about the same after chloramination began on April 8, 2014.

In acknowledgement to concerns expressed by some citizens before Ketchikan began disinfection with chloramines, water samples were analyzed by independent labs for N-Nitrosodimethylamine (NDMA) content. The results were the same both before and after chloramine disinfection started; Ketchikan's potable water doesn't contain any NDMA's; at least at the detection limit of the analytical equipment used which is 2 nanograms/ liter or 2 parts per trillion.