



2021 Kotzebue Water Quality Report

We are pleased to present this annual Water Quality Report for the year 2021 to inform you that your water is treated to the highest standards and was tested for approximately 50 contaminants and has been found to meet the EPA standard for all but two of them. Our constant goal is to provide you with a safe and dependable supply of drinking water. To that end we have finished the design process for the new water plant and construction has been underway since last summer. The new water plant, using the latest in state-of-the-art water treatment technology and being designed by world class professionals in the field, is expected to be operational by August of this year. This new water plant has been in the planning stages for over 15 years and we are finally hard at work seeing it through. We want you to understand the efforts we make to provide you with the highest quality drinking water and to protect our water resources. The State of Alaska has provided us with a Source Water Assessment, which identifies, among other things, potential sources of contamination to our water supply. There was nothing unexpected or of concern to the future of Kotzebue's drinking water. The report is available for viewing at the Water Plant Office.

The Kotzebue Municipal Water System (Public Water System ID 340060) was named the ***2011 Water System of the Year*** by the Alaska Rural Water Association, and the current supervisor was named the ***2017 Operator of the Year***, and the previous lead operator was recently named the ***2018 Operator of the Year***. The City employs water plant operators certified by the Alaska Department of Environmental Conservation that undergo continuing education through offsite and onsite training every year. An adequate supply of safe and pleasant water is not just our job, it is our commitment and career. The Water Treatment Plant is manned from 8:00 am to 5:00 pm every day of the year. An operator can be reached during normal working hours by calling the Water Plant at 442-5209. During non-working hours the Kotzebue Police Department (442-3351) can contact the on-call operator. A Water Treatment Plant Operator is always available.

Why Are There Contaminants in My Drinking Water?

As water travels over the land or underground, it may pick up substances or contaminants such as microbes, inorganic chemicals (non-living minerals), organic chemicals (substances derived from living matter), and (in some cases) radioactive substances. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791). 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 persons, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC (Center for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline.

Where Does My Water Come From?

The City of Kotzebue's drinking water is pumped from Devil's Lake about 2 miles east of the city. Vortac Lake is also a source of water for the city and is often used as such during the summertime. We are exploring the idea of installing a drainpipe under the dam for Vortac Lake to maximize the efficiency of using a natural gravity process instead of running the pumps all summer,

and we have been lowering the lake level in anticipation of making this happen. The water is treated at the Water Treatment Plant on Third Avenue to remove certain undesirable, but perfectly natural, characteristics such as color, turbidity, iron, manganese, algae, and disease-causing microbes (if present). The treated water is then stored in the two 1.5 million gallon blue storage tanks next to the plant in the public works yard in the approximate middle of the city. The finished water is then supplied to customers through the water distribution system or by a delivery truck. Our current water delivery truck, a 1700 gallon 1983 Ford, has reached the end of its' useful life and we have finally been able to purchase a 4000 gallon 2021 International that is currently in Anchorage awaiting placement on the next barge to arrive this summer so that we can continue to deliver water to those without running water to their home. Our water distribution system differs from the "normal, lower 48" distribution systems by being made up of five loops instead of a single, branched main. The loops ensure continuous circulation of the water so that it is always fresh. During cold weather heat may be added which, along with the circulation, helps prevent freezing of the water in the pipes.

How Do I Know That My Water is Safe?

Your drinking water is routinely monitored for contaminants according to Federal and State laws. Each month samples are collected and tested for Total Coliform Bacteria. These bacteria inhabit the intestinal tracts of all mammals and so are routinely found in all surface water supplies around the world. Nearly all strains of coliform bacteria are harmless to people, but we test for them because they are everywhere, and they are more resistant to disinfection than those which cause disease; and so a negative coliform test indicates that pathogenic organisms have been inactivated, if there were any there to begin with. These samples are collected by plant personnel and tested by the Maniilaq Environmental Health Laboratory. We have not had a positive Coliform sample in many years, except for one in 2017 caused by a sampling error. The immediate retest was negative. A positive coliform test would not necessarily indicate the water was unsafe, it would only indicate the possibility that it might be. The first indicator of a disease-causing microorganism in our water would be the loss of residual chlorine, and so we measure chlorine levels in the lab every day and report those levels to the state. We also have instruments that continuously monitor and record chlorine levels both going into the tanks and coming out with digital readouts that the operators frequently walk by during routine tasks. There is also an alarm system to notify the operators if chlorine levels fall outside of acceptable limits. Routine samples for chlorine, fluoride, pH, temperature, turbidity, color, and iron are collected and analyzed by our certified operators every day. We test for manganese, alkalinity and hardness on an as needed basis (usually 1-2 times per month), and we measure the corrosion potential of the water monthly. Regulatory samples for volatile organic chemicals, disinfection by-products, alkalinity, total organic carbon, inorganic chemicals, arsenic, nitrate, and radionuclides are collected by our operators and analyzed by an ADEC certified laboratory. Samples for lead and copper testing are collected by various homeowners in the community, and very soon lead and copper samples will be required from schools and daycare centers. The sanitary survey is done every three years by the Alaska Rural Water Association with the last one having been done in September 2021. This Sanitary Survey noted two deficiencies: the backwash water supply line has only a single check valve instead of the required dual check valve, and the other backflow prevention devices in the plant are not being tested annually. The new water plant and planned training will address these matters.

In 2017, 2018, 2019, and 2021 certain customers were given a Boil Water Notice as required by ADEC via a Public Service Announcement read on the air by the local radio station in response to a loop shutdown that was necessary to repair a leak in the water distribution system. As there was no way to repair the damage with the pipe under pressure, the loop circulation pump was shut off and the water main shut off valves were closed. After repairs the affected section of pipeline was flushed with fresh water from the tanks and all flush water was disposed of. There was no evidence that the water was ever contaminated from these events. Coliform testing confirmed the water was not ever contaminated, but the loss of pressure allowed for that possibility. Loss of pressure can create a siphon condition causing backflow of contaminants wherever a cross-connection exists. For example, if one were to use a garden hose to clear a frozen sewer line that would be a cross-connection. This is why backflow prevention devices, such as the hose bib vacuum breaker now found on many outdoor spigots, are so important. For the safety of everyone's water understand that the water system ends at the faucet, and the wastewater system begins at the sink overflow, and so any bridging of the air gap between those two points is a cross-connection that can potentially contaminate the water supply. In the future, any time there is a shutdown for repairs that cannot be done with the pipe under pressure the city plans to post a Boil Water Notice detailing those affected and their options, to flush the loop with fresh water from the tanks, dispose of the return water in the loop at the time of the shutdown,

monitor chlorine levels, and take coliform samples to ensure the water is safe to drink. This process should take about 1-2 days. Water loop maps can be consulted at City Hall, Public Works, the Water Plant, and www.cityofkotzebue.com to determine if you are on an affected loop during a Boil Water Notice. We have also spent considerable time mapping out the locations of main line shut off valves to minimize those affected by these events.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. Although many more contaminants were tested for, only those substances listed below were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old. In this table you will find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the following definitions:

MCL: *Maximum Contaminant Level* - The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.

MCLG: *Maximum Contaminant Level Goal* - The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

ppm: *Parts per million* - Corresponds to one part in one million parts. This unit is equal to one milligram per liter, which is the same as one penny in ten thousand dollars or about one tablespoon in a railroad tank car.

ppb: *Parts per billion* - Corresponds to one part in one billion parts. This unit is equal to one microgram per liter, which is the same as one penny in ten million dollars or about one tablespoon in 500 tanker trucks.

NTU: *Nephelometric Turbidity Units* - A measure of the amount of suspended particulates.

| 2021 TEST RESULTS | | | | | | | |
|-------------------------------|-------------|------------|---------------------|-------|------|----------|-----------------------------|
| Contaminant | Sample Date | Violation? | Amount | Units | MCLG | MCL | Most Likely Source |
| Inorganic Contaminants | | | | | | | |
| Arsenic | 1/13/2020 | No | 0.0 | ppb | 0.0 | 10.0 | Erosion of natural deposits |
| Antimony | 4/8/2014 | No | 0.161 | ppb | 6 | 6 | Erosion of natural deposits |
| Barium | 4/8/2014 | No | 0.063 | ppm | 2.0 | 2.0 | Erosion of natural deposits |
| Fluoride | Daily | No | 0.30 – 0.93 | ppm | 4.0 | 4.0 | Dental Health Additive |
| Nickel | 4/8/2014 | No | 3.54 | ppb | N/A | N/A | Erosion of natural deposits |
| Radium 226 and 228 | 5/8/2018 | No | 0.46, 1.40 | pCi/L | 0 | 5 | Erosion of natural deposits |
| Lead | 11/16/20 | No | 2.3 | ppb | 0.0 | 15.0 | Corrosion of home piping |
| Copper | 11/16/20 | No | 420 | ppb | 1300 | 1300 | Corrosion of home piping |
| Organic Contaminants | | | | | | | |
| Haloacetic Acids | Quarterly | Yes | 71.6 (54.0 – 88.2) | ppb | N/A | 60.0 | Disinfection by-product |
| Trihalomethanes | Quarterly | Yes | 96.7 (80.7 – 115.1) | ppb | N/A | 80.0 | Disinfection by-product |
| Distribution System Chlorine | Continuous | No | 0.01 – 2.42 | ppm | N/A | 4.0 | Disinfectant |
| Total Organic Carbon | Monthly | No | 1.82 – 9.74 | ppm | N/A | Variable | Naturally present |
| Turbidity | Continuous | No | 0.04 avg. | NTU | N/A | 0.3 | Soil runoff |

For Haloacetic acids and Trihalomethanes, the number listed is the highest locational running annual average and the numbers in parenthesis are the range of samples throughout the distribution system. For turbidity, 99.7% of samples were below the Treatment Technique value of 0.3. A value less than 95% constitutes a treatment technique violation. The highest single measurement was 0.39. Any measurement exceeding 0.30 is a violation unless otherwise approved by the state. A treatment technique is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant.

Violations

We exceeded the limit for Haloacetic Acids and Trihalomethanes. These are disinfection by-products and are the result of the reaction of chlorine with natural organic material such as humic and fulvic acids. Some people who drink water containing Trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. The City of Kotzebue has begun the process of replacing its current water plant with a new one that contains the latest and most effective water treatment technology. All other state and federal requirements were met.

Description of Water Treatment Process

Our water current water treatment process includes oxidation, coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, pH adjustment, and taste and odor control. Oxidation uses potassium permanganate to make the dissolved iron and manganese insoluble and it breaks apart the larger organic molecules that cause color and turbidity. Coagulation removes contaminants by adding alum and treatment polymers to form a “floc” (snowflake-like particles in the water made up of the contaminants and treatment chemicals). Flocculation is the gentle mixing of the water with a large paddle wheel to ensure that all treatment chemicals are evenly mixed. Taste and odor control is accomplished by using powdered activated carbon to adsorb various organic compounds that cause an objectionable taste or odor out of the water as the floc begins to form. Sedimentation allows the floc to settle out, and filtration removes smaller particles that did not settle out. Disinfection kills or inactivates pathogenic microbes with chlorine, and fluoridation promotes dental health by hardening tooth enamel. Almost half of the fluoride in your water is naturally occurring. Sodium carbonate is added for pH adjustment to assure that the water will not leach lead or copper out of home plumbing. The water is then stored in the two large, blue tanks until it is distributed to homes in the community. The new treatment plant will use oxidation, screening, ultrafiltration, nanofiltration, disinfection, fluoridation, and pH adjustment. The distribution pumping system will also be replaced and upgraded.

Additional Information for Lead

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. The Kotzebue Municipal Water System 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 or at <http://www.epa.gov/safewater/lead>.

Community Involvement

We at the Kotzebue Municipal Water System work hard to provide top quality water to every tap. We ask all of our customers to help us protect our water sources at Devil’s and Vortac Lakes by being aware of the importance of a clean water source and the many modern conveniences that can pose a threat to it, such as the oil and gasoline that run our snowmachines. In the summer of 2020 the trail over Devil’s Lake was moved to protect the lake from spillage of oil or gasoline, and we ask you to follow the trail markers for the new route from now on. These lakes are the heart of our community, our way of life, and our children’s future. Also, please be aware that vandalism and tampering with public water supply facilities are violations of Alaska and Federal Law. The FBI may investigate such violations. If you observe anyone vandalizing or acting in a suspicious manner around any of the water facilities, please contact the Kotzebue Police Department or the Alaska State Troopers immediately.

Further Information

If you have any questions about this report or concerning your water utility, please contact Matthew Lazarus, Water Plant Supervisor at mlazarus@kotzebue.org, or any water treatment plant operator at 442-5209. We want our valued customers to be informed about their utility.