



City of Danville 2017 Water Quality Report

PWSID # 5590100



Each year, the City of Danville compiles and distributes this report to comply with state and federal requirements. The purpose of this report is to provide you an overview of last year's (2017) drinking water quality. It includes details about where your water comes from and what it contains. We hope this report will provide the facts and perspective you need to make an informed evaluation of your tap water.

In this report, you will find a table showing the City of Danville had no violations of water quality standards during the 2017 calendar year. The substances detected were all well below the levels allowed. This does not happen by chance. Your drinking water is carefully protected from its source, the Dan River, through our treatment plant, and to your tap. Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) is responsible for setting national limits for hundreds of substances in drinking water and for specifying treatment processes to remove them. The Water Plant Lab is a state-certified water quality lab. The plant personnel perform over 4,000 tests of the water as it is being processed each month. Our treatment and distribution facilities are periodically inspected by the State.

We hold ourselves accountable to the public. Opportunities for increased understanding and involvement in water-related decision and policy making include attendance at the Danville Utility Commission Meetings, held at 4:00 p.m. on the fourth Monday of each month on the fourth floor at City Hall. Utility Commission meetings are broadcast on River City TV (Comcast cable TV channel 10), and the Danville City Council Meetings held at 7:00 p.m. on the first and third Tuesday of each month at City Hall. City Council meetings are also broadcast on River City TV (Comcast cable TV channel 10). If you have questions about this Water Quality Report or want more information about your drinking water, contact the Water Treatment Plant on Monday through Friday between 8:00 a.m. and 5:00 p.m. at 434-799-6473. To report leaks or tank over flows please call 799-5284 at any time, day or night. For customer service, please call 799-5155. If you have billing questions, please call 799-5159. Tours of our facilities are scheduled during business hours. Not only does the water plant produce drinking water to the City residents, we also supply small portions of Pittsylvania and Caswell counties.

TREATED WATER CHARACTERISTICS	
PARAMETER	TYPICAL VALUES
pH, standard units ⁽¹⁾	6.7-8.4, avg.=7.3
Alkalinity, mg/L	7-38, avg.=28
Calcium, mg/L	12.8
Total Hardness, mg/L ⁽¹⁾	24-120, avg.= 72
Fluoride, mg/L	0.56-0.73, avg. 0.67
Sodium, mg/L	4.71
Zinc, mg/L	<0.01
Aluminum, mg/L (SMCL ⁽²⁾ =0.05-0.2)	<0.05
Iron, mg/L (SMCL ⁽²⁾ =0.3)	<0.05
Manganese, mg/L (SMCL ⁽²⁾ =0.05)	<0.01
Water temperature, °F Winter	41-73, avg. = 59
Water temperature, °F Summer	62-84, avg. = 73
Average daily production: 4 –7 MGD Yearly avg.= 4.94 MGD	
(1) Varies with type of post pH adjustment used.	
(2) SMCL-Secondary Maximum Contaminant Level.	
mg/L The unit used in reporting the concentration of matter in water as determined by water analyses.	

Source Water

Danville's drinking water comes from what is classified as a surface water source, the Dan River. The Virginia Department of Health, Office of Drinking Water conducted a source water assessment on the Dan River in 2002. The assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern, and documentation of any known contamination within the last five years. The report is available by contacting the Water Treatment Plant. The river was determined to be "highly susceptible" to contamination using the criteria developed by the State in its approved Source Water Assessment Program. The sources of substances in the Dan River come from surface runoff as water travels over the surface of the land and dissolves naturally occurring minerals and substances resulting from the presence of animals and human activity. Contaminants that may be present in source water include: microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming; pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses; organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities. The presence of these substances in pretreated water does not necessarily indicate that the treated water is unsafe. 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 the water poses a health risk. 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/Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791 or EPA web page: www.epa.gov/ow

Water Quality Summary

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water produced by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. We constantly monitor for various compounds in the water supply to meet all regulatory requirements. The table on the following page lists only those compounds that had some level of detection. Many other compounds have been analyzed, but were not present or were below the detection limits of the lab equipment.

Crypto

Cryptosporidium are microscopic organisms that may enter surface waters from runoff containing animal wastes. If ingested, Cryptosporidium may cause diarrhea, fever and other gastrointestinal symptoms. The EPA Long Term 2 (LT2) Enhanced Surface Water Treatment Rule required the City to test the raw water for

Cryptosporidium, beginning February 2008, and continuing through January 2010. We are happy to report that these organisms were not detected during that round of testing. Beginning of the third quarter of 2016, we have started the second round of LT2 testing, continuing for 24 consecutive months. Although still early in the 2 year testing process, all results so far have been non-detects except for December 2017 when that result indicated <1 oocysts/L. These results are very good considering the farming make up in our water shed of the source water. Having various animal farming and wild life around the Smith and Dan Rivers having this low count of Cryptosporidium is outstanding.

Lead Levels

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 City of Danville is responsible for providing high quality drinking water, but cannot control the variety of materials used in the plumbing components inside your home or business. 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 (1-800-426-4791) or at <http://www.epa.gov/safewater/lead>. Results from the tri-annual testing done in 2015 are published in the accompanying table. Beginning in June of 2018, we will be repeat collecting samples from the state approved designated residential sample locations within our distribution system. These designated sites are from residential homes that were previously served with a lead service line (which has been replaced) or were constructed during the time period when lead solder was typically used for joining copper plumbing. Those results will be published in next year's Water Quality report for 2018.

Taste and Odor Issue

During 2017, we have not needed to feed PAC to the raw water and no odor has or is being detected in the raw water. We continue to test the PAC feeding equipment on a monthly basis for a short period to make sure that it remains operational if needed. A study has been funded by the US Fish and Wildlife Federation (FWLF) at the request of the city of Danville, the Halifax County Service Authority (HCSA) and the Virginia Department of Environmental Quality. This study will evaluate the water quality of the Smith and Dan rivers to try to determine what has caused the odor in the raw water from the Dan River and thus resulting in taste and odor of the treated water. The study is being conducted by Virginia Tech (VT) and coordinated by Dr. Greg Boardman (retired) and others from or associated with VT. The study will go through twelve months of sample collection from eleven sites on the two rivers. Samples will be collected of the sediment, water column and the surface of the water with testing for parameters established by VT and the members of the Dan River Water Quality Coalition which was formed to assist with study and consists of the representatives of the local and state governments with their consultants. Project update: the sampling portion of the study is complete and a draft report has been written. The draft report did not identify any specific cause for the odor events. Also these preliminary results appear to rule out the Duke coal ash spill as being associated with the odor events. Should odor occur in the raw water the City is equipped with a large PAC feeder to address the problem. Also the City is working to make the PAC feeder more efficient and safer to use with the installation of a 1,000 (or 2,000) pound sack attached to the existing unit. In addition the City has installed a river monitoring device in the Dan River near the Virginia and North Carolina state line. The parameters this real time river monitoring device is testing includes: pH, Turbidity, water depth, Conductivity and temperature. We plan to expand the list of parameters in the spring of 2018, to include dissolved oxygen and total algae concentration. These additional parameters will be helpful in building a data base that can help indicate changing river conditions that will alert us to possible taste and odor conditions in the future.

Trihalomethane Levels

The levels of total trihalomethanes (TTHMs) in some samples collected during 2017 were greater than the PMCL of 80 micrograms per liter (ug/L or ppb) but were not a violation of the drinking water standard. Compliance with the PMCL is based on a running annual average (4 quarters) of the quarterly samples collected and you will note the water supply did not exceed the drinking water limits on this basis. TTHMs are formed when trace amounts of naturally occurring organic compounds in the raw water source combine with chlorine that is used to disinfect the treated water. All locations do not have the same levels of TTHMs. Higher levels are expected in the areas with highest residence time (generally the furthest points in the system) and during the warmer months of the year. Some people who drink water containing TTHMs in excess of the PMCL over many years could experience problems with their liver, kidneys or central nervous system and may have increased risk of getting cancer. This water system will continue to be monitored for TTHMs. We intend to maintain compliance with the drinking water contaminants, with our ultimate goal being to minimize all drinking water contaminants.

Trihalomethane (THM) Removal Project

For some time now the city has been testing water samples from four sites within the distribution system for TTHMs. Compliance has been based on averaging quarterly samples from the four sites. The City has always been in compliance with the limit for THMs of 80 ppb. However, the criteria has changed to require each site to meet the limit of 80 ug/L based on the averaging of the consecutive four quarterly samples from that site. Meeting the new compliance limit at all sample sites would not likely be possible as new sites were included with the revised compliance limit. Therefore, the city hired Hazen and Sawyer to evaluate alternatives for reduction of the THMs. Hazen and Sawyer recommended mixing and aeration in the Ballou Park 8 million gallon storage reservoir as the best alternative for removing the THMs. Construction of this equipment was completed on April 15, 2015. Due to the construction time requirements of this project, the Virginia Department of Health, Office of Drinking Water (ODW) gave the city a two year extension to meet the new requirements. The HAA5 concentrations in the city water have always been below the MCL level and no problems are anticipated with the new compliance criteria. This removal project has been very successful in helping us remain below the quarterly MCL at all locations since the equipment was started in 2015.

Definitions & Table Key for regulated compounds table:

< - Less than. **AL** - Action Level, the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **HAA** - Haloacetic acids - Compounds formed during the chlorination (disinfection) of drinking water. **LRAA** - Locational Running Annual Average - Average amount detected is the highest locational running annual average of the 4 stage two compliance sample sites. **MCL** - Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goals as feasible using the best available treatment technology. **MCLG** - Maximum Contaminant Level Goal - 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. **MRDL** - Maximum Residual Disinfectant Level - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants. **MRDLG** - Maximum Residual Disinfectant Level Goal - Level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect benefits of use of disinfectants to control microbial contaminants. **NA** - Not Applicable. **ND** - Non Detect. **NTU** - Nephelometric Turbidity Unit, a measure of very small particulate matter in drinking water. **ppb** - one part per billion; the equivalent of 1¢ in \$10,000,000. **ppm** - one part per million, the equivalent of 1¢ in \$10,000. **Sources** - The major sources of the compounds detected in the finished water. **TOC** - Total Organic Carbon has no health effects. However, it provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes and haloacetic acids. Compliance with the treatment technique (TT) reduces the formation of these disinfection by-products. **TT** - Treatment Technique, a required process intended to reduce the level of a contaminant in drinking water. **pCi/L** - Picocuries per Liter, a measure of radioactivity. **TTHM** - Total Trihalomethanes - Compounds formed during the chlorination (disinfection) of drinking water. **UCMR** - Unregulated Contaminant Monitoring Rule - Purpose is to assist the EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. The results detected during our UCMR monitoring are noted in a separate table elsewhere in this report. Unregulated contaminants are those for which EPA has not established drinking water standards. **Variances and exemptions** - State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

REGULATED COMPOUNDS

See helpful table Definitions & Table Key above

Contaminant & Unit of Measurement ⁽¹⁾	MCLG	MCL	Level Detected And / or Range	Violation	Date of Sample	Sources of Substance or Compound
Gross Alpha ⁽²⁾ pCi/L	0	15	<0.6	NO	May 2014 Every 6 Yrs.	Erosion of natural deposits
Combined Radium ⁽²⁾ pCi/L	0	5	<0.6	NO	May 2014 Every 6 Yrs.	Erosion of natural deposits
Beta Emitters ⁽²⁾ pCi/L	0	50	1.8	NO	May 2014 Every 6 Yrs.	Decay of natural and man-made deposits
Notes:						
(1) Detected Compounds - Listed are 14 parameters detected in Danville's drinking water, nine (9) parameters during calendar year 2017. The State allows us to monitor for some compounds less than once per year because the concentrations of these compounds do not change frequently.						
(2) This data is the latest available. The SDWA requires that the highest value/lowest removal ratio detected during the calendar year be provided in this report. Not listed are the hundreds of other compounds for which we tested that were not detected.						
(3) Compliance based on 90% of samples being below action level (AL). This note is for Lead & Copper below.						
Lead ⁽²⁾⁽³⁾ ppb	0	AL = 15	90 th = 1.2 ND -3.4	NO	July/August 2015 Every 3 Yrs.	Corrosion of household plumbing systems; erosion of natural deposits
Copper ⁽²⁾⁽³⁾ ppm	1.3	AL = 1.3	90 th = 0.097 0.002- 0.140	NO	July/August 2015 Every 3 Yrs.	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Barium ppm	2	2	0.021	NO	August 2017 Annually	Discharge of drilling waste; Discharge from metal refineries; Erosion of natural deposits
Turbidity NTU In Finished Water	N/A	TT = 1 NTU max	Max = 0.223 Range: 0.008 – 0.223	NO	Tested continuously at plant	Soil runoff
		TT = at least 95% of the monthly samples <0.3 NTU	100%		N/A	
Stage 2						
TTHM Site 1 ppb Stokesland Tank	N/A	80	LRAA = 69 Range: 37-89	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 2 ppb Lombardy Court	N/A	80	LRAA = 78 Range: 54-91	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 3 ppb Holland Road	N/A	80	LRAA= 76 Range: 43-91	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
TTHM Site 4 ppb Piney Forest Tank	N/A	80	LRAA = 41 Range: 23-65	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
Fluoride ppm	4	4	Avg. 0.67 ppm Range: 0.56-0.73	NO	Tested continuously at plant	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories; desired level 0.7
Nitrate ppm	10	10	0.30	NO	August 2017 Annually	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Chlorine ppm	MRDL G = 4	MRDL = 4	Highest Qtrly Avg. 0.86 Range: ND-1.97	NO	Tested daily along with Coliform samples collected in our service area	Water additive used to control microbes.
Total Organic Carbon - TOC ppm	N/A	TT – Based on the percentage of TOC removed during the treatment process; ratio must be greater than or equal to 1.00	TOC removal Ratio Lowest Running Avg. 1.32 Range: 1.00-1.71	NO	Tested monthly at raw and treated water.	Naturally present in the environment.
Stage 2						
HAA Site 1 ppb Stokesland Tank	N/A	60	LRAA = 45 Range: 19-44	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
HAA Site 2 ppb Lombardy Court	N/A	60	LRAA = 35 Range: 24-50	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination

Contaminant & Unit of Measurement ⁽¹⁾	MCLG	MCL	Level Detected And / or Range	Violation	Date of Sample	Sources of Substance or Compound
Stage 2 HAA continued						
HAA Site 3 ppb Holland Road	N/A	60	LRAA= 24 Range: 7-30	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
HAA Site 4 ppb Piney Forest Tank	N/A	60	LRAA = 32 Range: 20-33	NO	Tested quarterly Results are site specific	By-product of drinking water chlorination
Total Coliform ⁽⁴⁾	0	Presence of coliform bacteria in no more than 5% samples per month ⁽⁴⁾	Maximum monthly detection level 2.67% for August 2017. 2 of 75 samples	NO	Typically tested daily; rotating through a minimum of 50 locations per month	Naturally present in the environment
Notes: (4) Compliance based on the number of Total Coliform positive samples being divided by the number of samples collected with the monthly % being below 5%.						

Based on population, we are required to collect a minimum of 50 compliance samples per month. Daily we collect three samples for bacteriological and chemical analysis from representative areas within the city that leads to an average of 60 samples per month being analyzed. As part of the RTCR we are providing more detailed information about the presence of coliforms in drinking water than what is listed in the table above. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. In the event we were to detect coliforms at the trigger level, then we would need to perform specific assessments to look for potential problems in the water treatment or distribution system as outlined in the RTCR. In the event we were to conduct an assessment of our system and identified potential problems, we would correct those problems immediately.