

“Words on Wenham’s Water” by Ernest Ashley

I would like to share with you how Wenham water works. We have a valuable resource here that we all must share and that we can be proud of. Perhaps some in-depth information would be useful and may be of interest to the community. My name is Ernest Ashley and I am a Commissioner for the Town of Wenham’s Water Department. I am also a hydrogeologist and find this stuff really cool so, maybe, you will too.

Where does our water come from? How is it treated? Is it good for us? How much is there? Why do we have water restrictions? etc. Let me start out with geography.

Wenham’s water supply is sourced from two wells located south of Pleasant Pond along a bend in Pleasant Street. The distribution system extends throughout the towns and connects at the boundaries with systems from adjacent towns. If needed, water could be transferred from one town to another but in normal operation, the valves are always closed. We have two tanks that provide storage and pressure to the system; one on Lord’s Hill near the Beverly Airport and one at the Iron Rail property.

Now for some geology. Our water is drawn from a confined aquifer, meaning a sand and gravel layer from which we can pump water and, which lies beneath a thick, widespread clay layer that separates it from the surface and the shallower water table above. The wells are next to the Great Wenham Swamp and near the Ipswich River. Our aquifer is recharged from water in these and other wetlands. This is a good thing. It is a really good thing. The organic material in the wetlands purifies the water (more on that later) and it is filtered through the clay layer and the sand and gravel in the aquifer on the way to our wells. Our water is moderately hard. What is so hard about water? Hardness

makes it hard to make soap suds and leaves a white stuff behind when it dries. Our water has a lot less iron and manganese (metals that stain your fixtures – and laundry) than some other nearby systems. It is good stuff.

Before water is distributed throughout the town, we add three things: a corrosion inhibitor and chlorine to keep it safe and fluoride. Let's start with the corrosion inhibitor; zinc orthophosphate. This non-toxic chemical prevents the copper in water pipes and lead that may be in pipes or solder from leaching out and getting into your drinking water. This is what was missing with tragic consequences when Flint Michigan recently made changes to its water supply. As required by the MassDEP and the USEPA, we also add just enough chlorine to kill all the bacteria and viruses that might contaminate the water.

We add a minimal amount of fluoride. Fluoride in drinking water was, and in some places still is, controversial. However, the overwhelming evidence is that it is safe and has resulted in one of the most striking improvement in human health. Fluoride is incorporated into our teeth and bones making both much stronger. Just think of how many fewer cavities our children have than those of us over 50 did when we were young. And as my dentist keeps telling me, good oral health is key to good overall health. We test the water in schools and at various locations throughout the distribution system and confirm that the trace levels of metals and chemicals are well below levels considered safe. Each year we produce a Consumer Confidence Report that provides the results of our testing. Please contact the Wenham Water Department if you have any questions. It is good for you. Please enjoy use and enjoy Wenham water.

Water is the ultimate renewable, recyclable, and sustainable resource – except when isn't. We live in Enon, an early name for Wenham which means “much water”. A great portion of the town and surrounding area is wetlands including the Great Wenham Swamp. Our area is blessed with relatively consistent rainfall and snow melt totaling about 33” a year. Of that about a third runs off, more than a third evaporates and less than a third soaks into the ground to sustain our groundwater source. The runoff and more importantly, the groundwater sustains our wetlands, rivers and streams. All in all, it is a beautiful system to capture, purify, filter and enhance the rainwater that recharges a limited resource.

Did I say limited? I did, because each year there is a limited amount of recharge and we all live in the same “bucket” that is the Ipswich River Basin. Although extensive and blessed with typically abundant rainfall, the basin is populated by lots of water users. In general, we in Wenham can and usually do, live within the “yield” of the basin. During times of drought and/or excessive water use, the basin is in a “negative balance”; and streams and rivers dry up. The groundwater levels throughout the basin determine the water levels in our streams and rivers.

Time histories show that summer water levels in the Ipswich River are typically lower than historic summer levels. This may be due to long-term trends in weather but is certainly also the increasing development and water withdrawals. The Massachusetts Department of Environmental Protection, (MassDEP), has developed “safe yield” values for how much water can be taken from the basin and still support the life of and in the rivers. During periods of excessive use for irrigation, towns and cities can exceed the safe yield of the basin.

Irrigation is key here. If done right it produces an abundance of greenery, product and produce. But done excessively or inefficiently, it results in a lot of water lost due to evaporation. We have bylaws in Wenham that limit the time of day you can water so as to limit evaporation loss. We have a bylaw that applies water restrictions to private wells because, as noted above, we are all in the same bucket. Comparing the winter water use to the summer months tells us how much water we use for basic household and community needs, and how much more is used in the summer, primarily for watering lawns.

But why do *WE* have water restrictions? The short answer is because MassDEP tells us we do. Now for the long-winded version. When the water levels drops till the flow gage on the Ipswich River drops below 52.5 cubic feet/second (393 gallons a second over a spillway), the MassDEP tells us we have to impose a water ban. It's a river! That's not much water! Water levels in the area surrounding the river are what sustains the river flow. It's the "we're all in the same bucket" concept.

I emphasized *we* because some of us have noticed how other communities, just down the street from us do not have the same water restrictions. While our drinking water is from a groundwater source, the Salem/Beverly water system is comprised of three reservoirs: Putnamville, Longwood and Wenham Lake. Yep, Wenham Lake, ice supply to the Queen of England, is not part of our water system. Sorry folks, I was not on the water commission when that deal was made.

The much larger Salem/Beverly system, withdraws water from the Ipswich River during periods of abundant flow. That occurs most of the year except the summer so they cannot pump anymore water from the river during the summer and must rely on the

supply they have stored. They do not pump groundwater from the basin during the summer so their water use makes no difference to the water levels in the river. Hence, no water restrictions in Beverly and Mandatory Water Conservation in Wenham. But they still shouldn't water during the day!!!

We have two levels of water restrictions. The first is "Mandatory Water Conservation". Sounds serious, and intentionally so. It basically means follow our bylaws (no watering from 9:00 am till 5:00 pm). A Water Ban occurs when the water level in the Ipswich River drops below the 52.5 cubic feet per second levels. This usually happens in the early summer often despite how much snow we have. But what's a Water Commissioner to do? I want our place to look good too, and I have some grass seed to plant. Well, there are ways to have a healthy lawn and use very little water. I am going to get the seed out there early, and once it is established I am going to keep it a bit long to conserve water.

Is it good water? Oh yes. I travel for work and when I can, for pleasure. I always notice how water smells and tastes and how it runs off your skin in the shower. Every time I come home I notice our water seems "just right". So, I hope you will use, conserve and enjoy Wenham water.

Ernest Ashley is an environmental consultant and hydrogeologist with CDM Smith in Boston, MA. He serves as Chairman of the Wenham Water Commissioners and is a founding member of the Massachusetts Geological Society.