

WMAC Meeting Minutes, October 20, 2016

Attendees: David Crosby - Chair, Mark Altbet, Anne Carney, David Hearne, Lealdon Langley, Rory McGregor – Secretary

Guest: Eric Hooper, Superintendent - Sharon DPW; Nancy Fyler – Sharon Water Conservation Coordinator (staff member at Neponset River Watershed Association)

1. Minutes from September 15 meeting were approved.
2. Terminology related to “Impact of Wells on Stream Flow” was presented by Lealdon Langley. Document summarizing the presentation appears at the end of these minutes. Please refer to another document for a detailed review of this issue: Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow, USGS Circular 1376.
3. Eric Hooper will address the water rate pricing for 2017 at the next meeting. He will prepare the review of water user groups and corresponding revenue from each. Implementation of price increase will not take place until Q2 in calendar year 2017. At least 60 days is needed to publicly review the pricing proposal once it is submitted to the selectmen.
4. Eric Hooper reported that ground water elevation levels have trended down in some locations where monitoring is conducted reflecting the impact of this year’s sustained drought. With regard to nitrates – October samples were collected but results not returned from the lab.
5. Revenue is approximately \$35K below last year at this time; however, Water Department is on track for annual revenue of approximately \$3.5 million, which will meet budget projection.
6. Pumping is well below historical average. Maximum day for September is 1.28 million gallons, which is approaching pumping totals more typical of winter time use. Pumping for month is 34,824,000 gallons. Annual pumping total is on target for approximately 460 million gallons, second lowest recorded total.
7. Unaccounted for water is approximately 10.61% for the month of September, 8.74% for year to date, well within permitted limit, considerably below totals for the past two years.
8. Construction projects for water main replacements: South Pleasant Street/Chestnut Street. Ongoing connection to Depot Street and South Main Street has been completed.
9. FY18 Budget preparation is ongoing. South Pleasant Street project to be proposed for completion, Meadow Road main replacement proposed for in-house effort.
10. Mark Altbet suggested reading “Let There Be Water”, Seth M. Siegel, Israel’s Solution for a Water Starved World, www.lettherebewater.com
11. The next meeting will be Thursday November 17th at 7:30 pm at the Community Center.

Respectfully submitted,

Rory McGregor

Water Management Committee Presentation
Impact of Wells on Stream Flow
October 20, 2016
By Lealdon Langley

Part 1 – Terminology

Watershed - A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The word watershed is sometimes used interchangeably with drainage basin or catchment. Ridges and hills that separate two watersheds are called the drainage divide. The watershed consists of surface water--lakes, streams, reservoirs, and wetlands--and all the underlying ground water. Larger watersheds contain many smaller watersheds. It all depends on the outflow point; **all of the land that drains water to the outflow point is the watershed for that outflow location.** (emphasis added)

Source: United States Geological Survey (USGS);
<http://water.usgs.gov/edu/watershed.html>

Base flow--sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by groundwater discharges. Source: Water Science Glossary of Terms, United States Geological Survey (USGS)
<http://water.usgs.gov/edu/dictionary.html>

Induced infiltration – “the volume of water discharged from the stream to the aquifer”. Source National Center for Scientific Research
<http://www.refdoc.fr/?traduire=en#>

Stream order is a measure of the relative size of streams. The smallest **tributaries** are referred to as first-order streams, while the largest river in the world, the Amazon, is a twelfth-order waterway. First- through third-order streams are called **headwater** streams. Over 80% of the total length of Earth's waterways are headwater streams. Streams classified as fourth- through sixth-order are considered medium streams. A stream that is seventh-order or larger constitutes a river. Source: Classroom of the Future
<http://www.cotf.edu/ete/modules/waterq3/WQassess4b.html>



Part 2 – Concepts

Wells (groundwater withdrawal points) can impact streamflow by capturing base flow that would otherwise discharge to a stream and by inducing infiltration;

Refer to “Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow”; United States Geological Survey (USGS), Circular 1376, Figure 7

Part 3 – Impacts on Wildlife, fisheries and aquatic organism habitat by low flow conditions and streamflow depletion by wells.

1. Refer to figure on riffle and pool habitat. Source:
<https://msnucleus.org/watersheds/images/stream01.gif>
2. Shallow water depths decrease the amount of vertical water column habitat for fish and aquatic organisms.
3. Shallow water depths are likely to have warmer water temperatures that are detrimental to cold-water species.
4. Warmer water contains less dissolved oxygen which is detrimental to aquatic organisms.
5. Shallow water depths increase the potential for predation on fish and aquatic organisms.
6. Streams and rivers are linear features of the landscape that provide opportunity for wildlife, fish and aquatic organisms to move in order to access habitat for foraging, breeding, spawning, and other life processes including escape from predators and unfavorable conditions. When barriers to access exist along this linear feature, such as inadequate stream crossings and shallow water levels for long periods of time, exchange of genetic material within species is compromised, weakening species resiliency.

Part 4 – Watershed scale impacts of water withdrawals in Sharon and in the Neponset River Watershed

1. Refer to Neponset River Watershed Map. Source:
<https://www.neponset.org/your-watershed/your-watershed-map/>

2. **Pour point** - “the bottom of the watershed or the pour point is the lowest point of the land area where water flows out of the watershed.” Source: EnviroAtlas, Data Fact Sheet, Watershed Boundaries, HUC 4, HUC 8 and HUC 12;
<https://enviroatlas.epa.gov/enviroatlas/datafactsheets/pdf/Supplemental/HUC.pdf>
3. Refer to Massachusetts Department of Environmental Protection, Sustainable Water Management Initiative (SWMI) for the portion of the Neponset River Watershed