Horsham Water Quality

June 27, 2016

What are PFCs?

- Perfluorinated Compounds, or PFCs, are a family of 20 chemical compounds, not found in nature. PFCs are an emerging contaminant, but not regulated by EPA as hazardous substances.
- We think of this as a local issue, but PFCs are an international problem. EPA has been studying PFCs since 1999, but Europe has studied them much longer.
- U.S. Department of Defense has identified 644 potential sites, and to date, PFCs have been found in 63 public water supplies.
- 98% of people tested have some level of PFCs in their blood. Tests on polar bears have shown levels of PFCs.

Sources of PFCs

- PFCs in Horsham's water are believed to come from fire-fighting foam used in flight operations at the NASJRB.

- Experts estimate that only 5% of PFCs produced were used in fire-fighting foam. Other sources include:

  - Microwave popcorn (Orville Redenbacher recently stopped using PFCs)
  - Fast food wrappers
  - Scotchgard (until 2002)
  - Non-stick cooking surfaces (Teflon)
  - Dental floss
  - Water-repellent clothing

  - The majority of PFCs were phased out of production by the end of 2015.

PFC Regulations

- Prior to May of this year, the EPA had Provisional (short-term) Health Advisory Levels for PFOA and PFOS:
  - 400 parts per trillion (ppt) for PFOA
  - 200 parts per trillion (ppt) for PFOS
- In an effort to be proactive, HWSA and Horsham Council adopted a 100 ppt limit for PFOA on April 8, 2016. This level was based on information from EPA Region 2 when large amounts of PFCs were found in the water supply of Hoosick Falls, NY.
- In May 2016, EPA issued a Lifetime Health Advisory Limit (LHAL) of 70 parts per trillion for PFOA and PFOS.

Other Regulatory Levels

- Other countries have been regulating PFCs for a number of years. For example:
  - Sweden - 90 ppt (all PFCs)
  - Denmark - 100 ppt (all PFCs)
  - Germany – 300 ppt (PFOS and PFOA)
  - United Kingdom - 300 ppt (PFOS and PFOA)
  - The Netherlands - 530 ppt (PFOS only)
  - Canada – 600 ppt (PFOS) 200 ppt (PFOA)

- Some states have issued regulations
  - Vermont - 20 ppt of PFOA only (no standard for PFOS)
  - New Jersey - 40 ppt of PFOA only (no standard for PFOS)
  - Minnesota - 300 ppt for combined PFOA and PFOS

What is One Part per Trillion?

- The sun is 93 million miles away. If you moved six inches closer to the sun, you would be one part per trillion closer.
- One part per trillion is one drop of water in 20 Olympic-sized swimming pools.

Our Water System

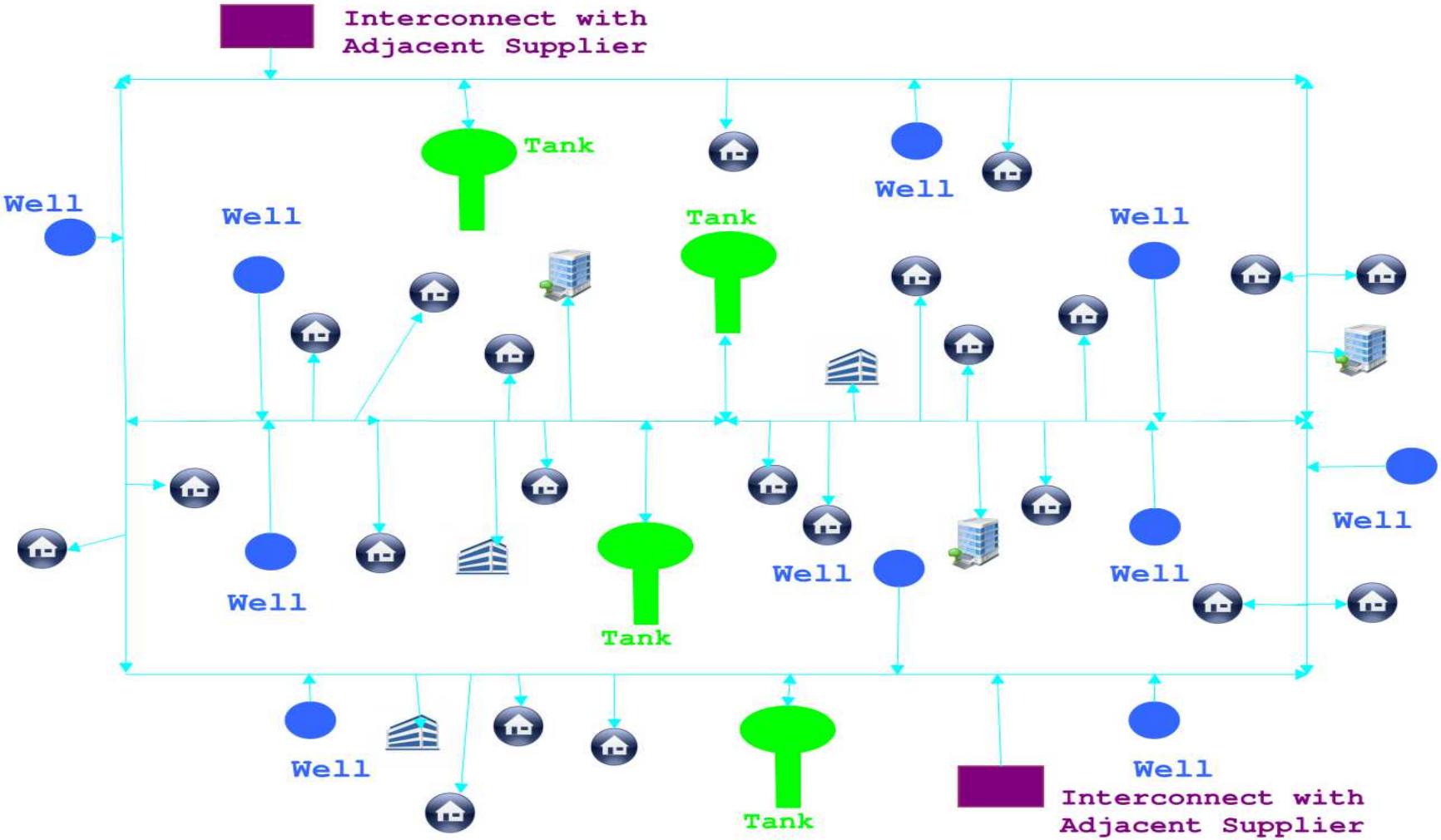
Our water system is owned and operated by the Horsham Water and Sewer Authority. HWSA is an independent governmental unit which works closely with the Horsham Township Council.

Our water system is a combination of wells which pump water from deep under the ground (ground water) and water which is purchased from other water entities. Purchased water is often water from reservoirs and rivers which is treated before being distributed (surface water).

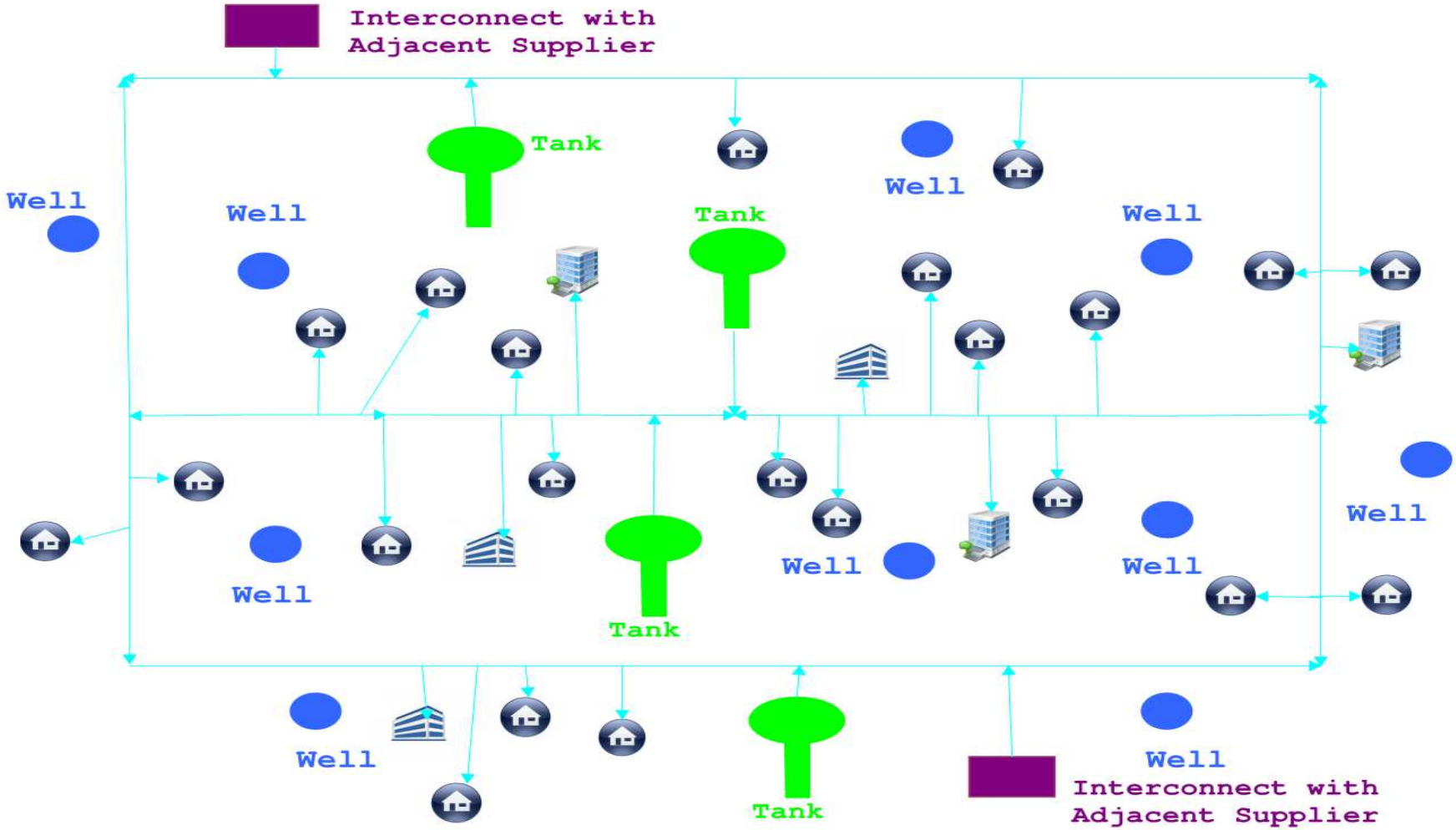
Current sources of our drinking water:

- 15 HWSA groundwater wells- 9 of which are in use.
- 400,000 gallon per day (under a contract which allows us to purchase up to 800,000 gpd) of surface water from North Wales Water Authority which is treated at the Forest Park Treatment Plant.
- 400,000 gpd of surface and groundwater from Aqua Pennsylvania.

How Our System Works
Flows - Wells On



How Our Water System Works
Flows - Wells Off



Status of Water Quality

- Five HWSA wells were over the EPA advisories and were removed from service immediately.
- Additional water is being purchased to supplement our water supply.
- PFCs in your public water supply are currently at levels significantly below the EPA LHAL.
- Currently, the average combined PFOA/PFOS level in the public water supply is 18 ppt. The well with the highest combined level has been tested at 33 ppt, well below the EPA LHAL of 70 ppt.

Township and HWSA Action

What we have been doing? The Township has engaged in a three-prong course of action to best serve our residents:

- Communication
- Education
- Remediation

HWSA has been engaged in designing treatment systems, connecting private wells to the public system, working with state and federal officials, and meeting with other water providers to find additional sources of water.

Communication

Communications with residents:

- Website: Keep current at http://www.horsham.org and www.horshamwater-sewer.com.
- Telephone Hotline: call 215-907-0034 for a live person who will work with you to find answers to your questions. Messages left after hours will be answered promptly.
- Dedicated email address: emails addressed to water@horsham.org will receive priority treatment from staff members best able to answer your questions.
- Facebook: Like Horsham Township on Facebook to receive updates on the Township's efforts.
- Twitter: Follow Horsham Township on Twitter for updates and information.

Education

Township's Education:

- Extensive discussions with EPA and ATSDR (a division of CDC);
- Extensive discussions with the Navy;
- Working with Township and HWSA consultants;
- Representatives of Township and HLRA recently attended a conference for defense communities and attended seminars on PFCs; engaged in discussions with the Navy;
- The Township is arranging in-home testing for residents and businesses. We plan to test several homes in each neighborhood to ensure representative sampling. In the next couple of weeks, we will be asking for volunteers.

Education (continued)

Education of residents:

- On August 15 from 6:30 to 8:30 PM, the Township will host a meeting with ATSDR (a branch of the Center for Disease Control), EPA, and other federal agencies. At this meeting Council and residents will have the opportunity to ask questions about health effects.

- The Township has prepared and mailed to our residents a list of frequently asked questions to help address our residents' concerns about PFCs. The FAQs are updated as new information is gathered. The FAQs are also available on the Township and HWSA websites.

- Hotline available at the Township to answer questions.

Remediation

- HWSA responded immediately to EPA advisory levels by taking five wells off line and contracting with the Navy to ensure that the cost of remediating those wells will be borne by the Navy.

- HWSA is working with North Wales Water Authority and the North Penn Water Authority to ensure additional water is available as we work on design and construction of treatment filters at our wells.

- After researching all options, it was determined that Granular Activated Carbon filters are the most effective and efficient means of removing PFCs from public drinking water.

Remediation

Here is an example of a two unit GAC Filter. Each remediated well will need a dual filter. Each filter must be custom-designed and built for the well it treats.

Carbon Filters Being Installed

Photo courtesy of Warminster Municipal Authority

Each permanent GAC filter will be housed in a building like this one. The GAC filters will be located near the well it treats. Each filter needs to be tested for forty-five days before the water from the well can be used in our system. In order to speed up the remediation schedule, some wells will be treated with temporary filters while the permanent filters are designed and installed.

Remediation Options

- The Authority engineers are designing GAC filters for the five wells which have been taken offline, and are working with manufacturers to rent temporary filters for three of those wells.
- GAC filters for all five wells removed from service are expected to be installed between now and the end of this year.
- HWSA and the Township worked together to prepare options for further reducing PFCs while insuring that we have ample water to serve our residents and businesses.
- The options presented this evening represent the remediation phase which began months ago and will continue through the end of the year. We refer to this as our short-term remediation plan.

Option One

Maintain the Status Quo

Because HWSA responded immediately to comply with all EPA health advisories, the PFCs levels in our drinking water are significantly below the EPA LHAL. Without further action by Council or HWSA, the existing conditions are:

Purchased Water:

- Aqua - 400,000 gpd
- North Wales - 400,000 gpd

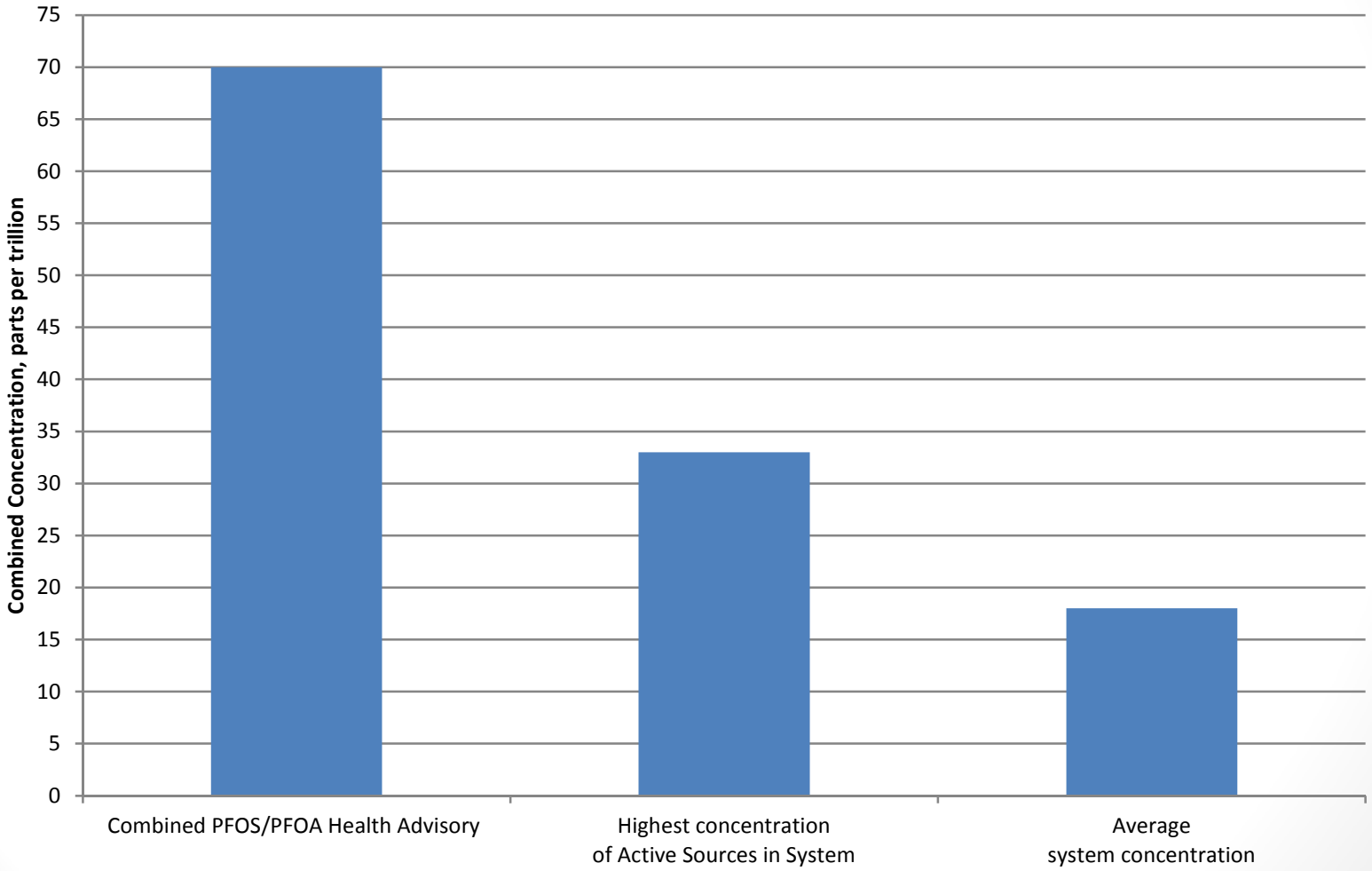
Well Water:

- Wells 2, 20, 22, 1, 4, 19, 9, 3, and 7.

PFC Levels:

- Highest source in the system: approximately 33 ppt
- System average: approximately 18 ppt
- Percentage of EPA LHAL: approximately 25%

Option One Highest & Average Combined PFOS/PFOA Concentration in System



Option Two

Purchased Water:

- Aqua - 225,000 gpd
- North Wales - 400,000 gpd

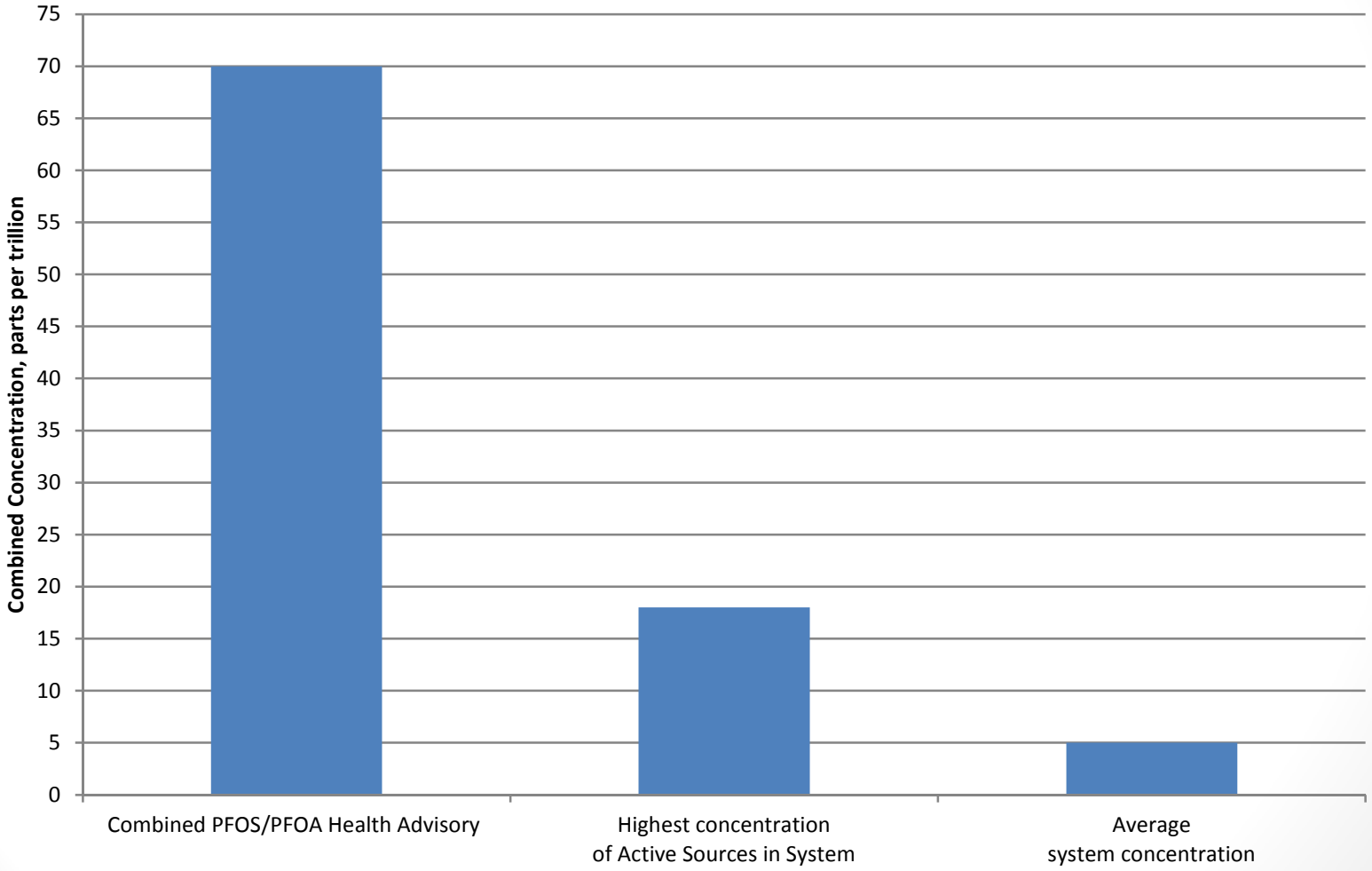
Well Water:

- 5 remediated wells plus wells 4, 19, 9, 3, and 7.
- Wells 2, 20, 22, and 1 are offline.

PFC Levels:

- Highest source in the system: 18 ppt
- System average: approximately 5 ppt
- Percentage of EPA LHAL: approximately 7%

Option Two
Highest & Average Combined PFOS/PFOA Concentration in System



Option Three

Purchased Water:

- Aqua - 225,000 gpd
- North Wales - 800,000 gpd

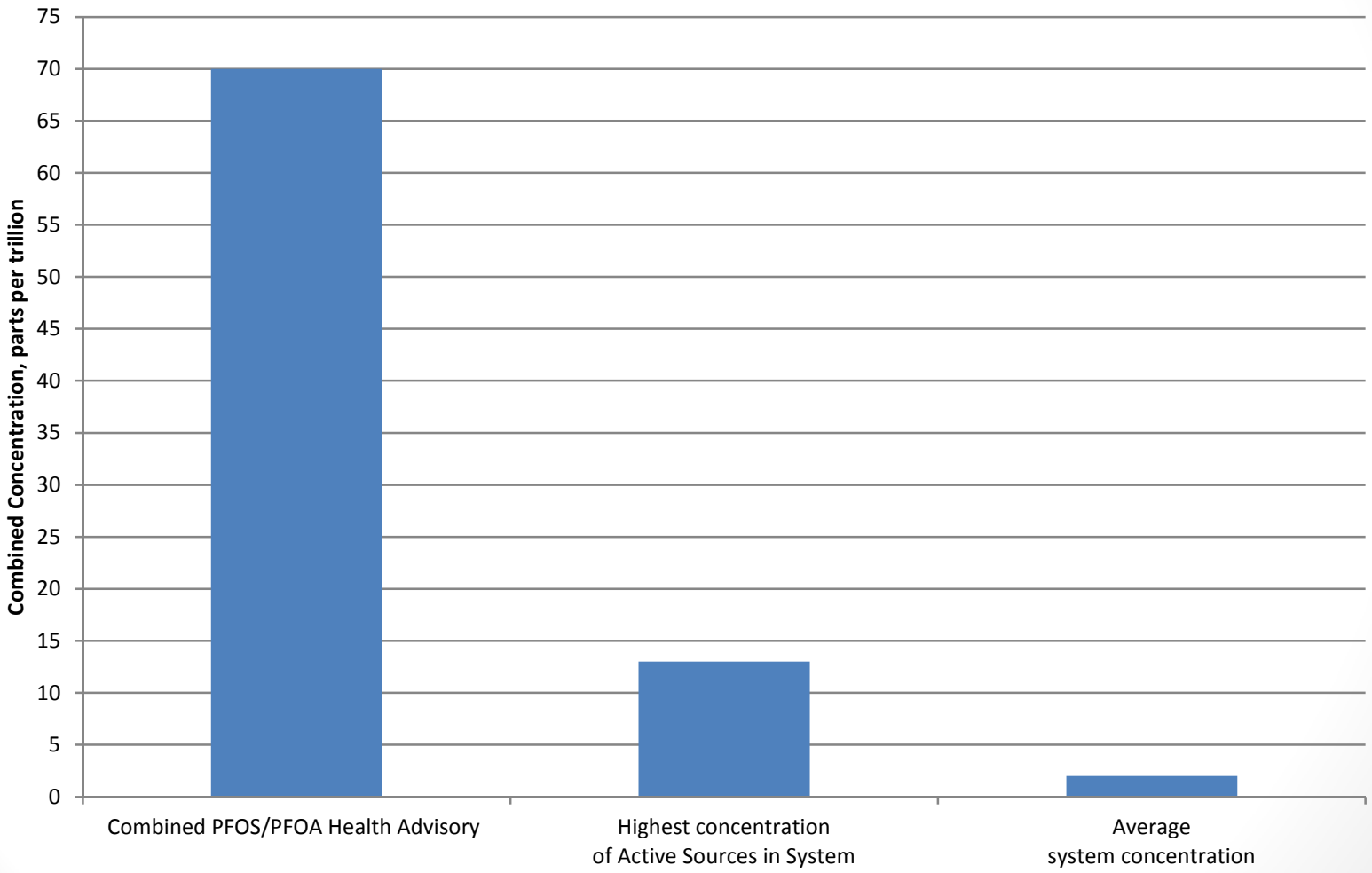
Well Water:

- 5 remediated wells plus 9, 3 and 7.
- Wells 2, 20, 22, 4, 19, and 1 are offline.

PFC Levels:

- Highest source in the system: 13 ppt
- System average: approximately 2 ppt
- Percentage of EPA LHAL: approximately 3%

Option Three Highest & Average Combined PFOS/PFOA Concentration in System



Option Four

Purchased Water:

- Aqua - 225,000 gpd
- North Wales (w/ North Penn back-up) - 1,200,000 gpd

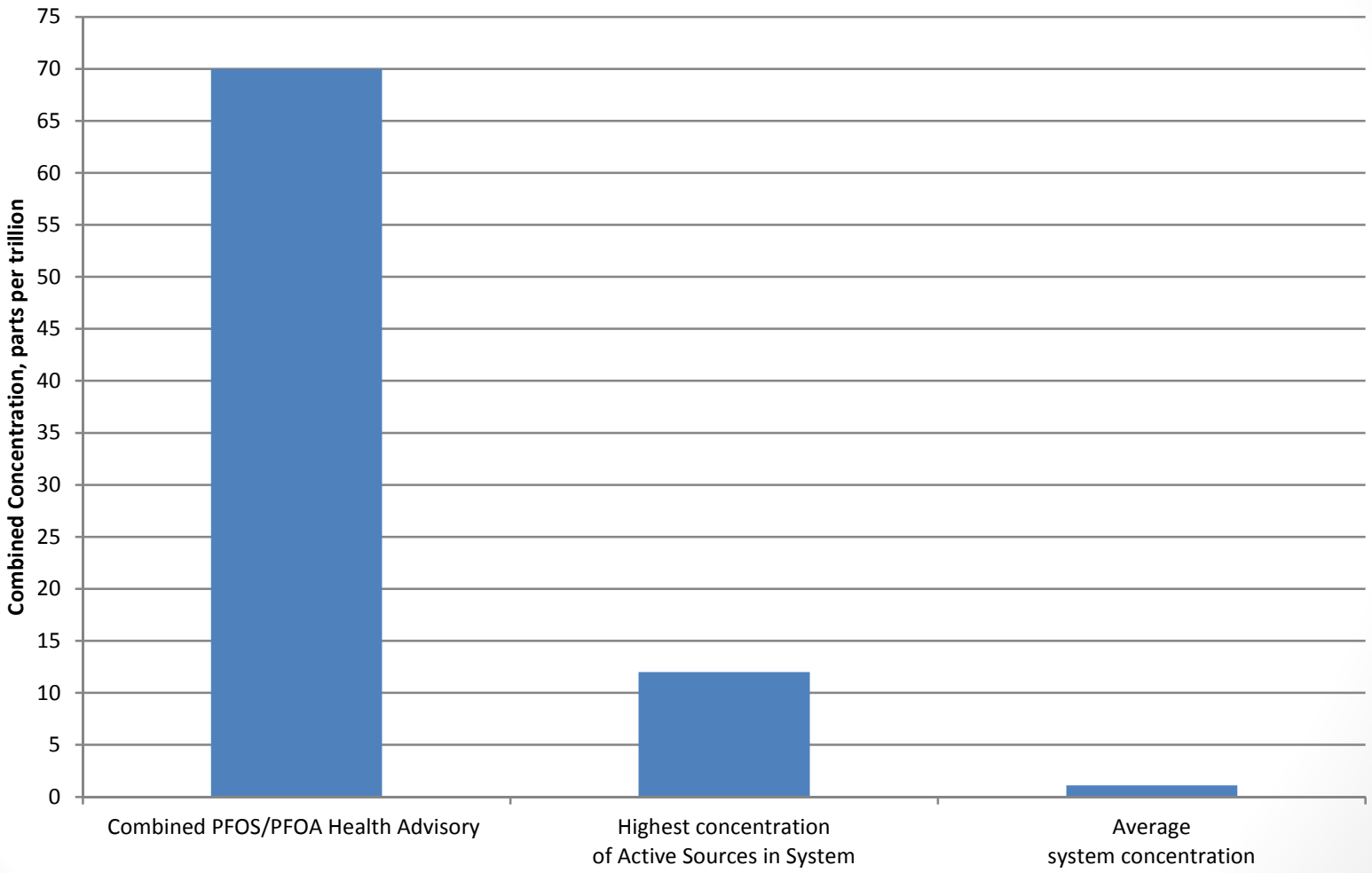
Well Water:

- 5 remediated wells only. All the rest are offline.

PFC Levels:

- Highest source in the system: 12 ppt
- System average: approximately 1.1 ppt
- Percentage of EPA LHAL: approximately 1.5%

Option Four Highest & Average Combined PFOS/PFOA Concentration in System



Option Five

Purchased Water:

- Aqua - 0 gpd (still need to pay for minimum requirement)
- North Wales (w/ North Penn back-up) - 1,200,000 gpd

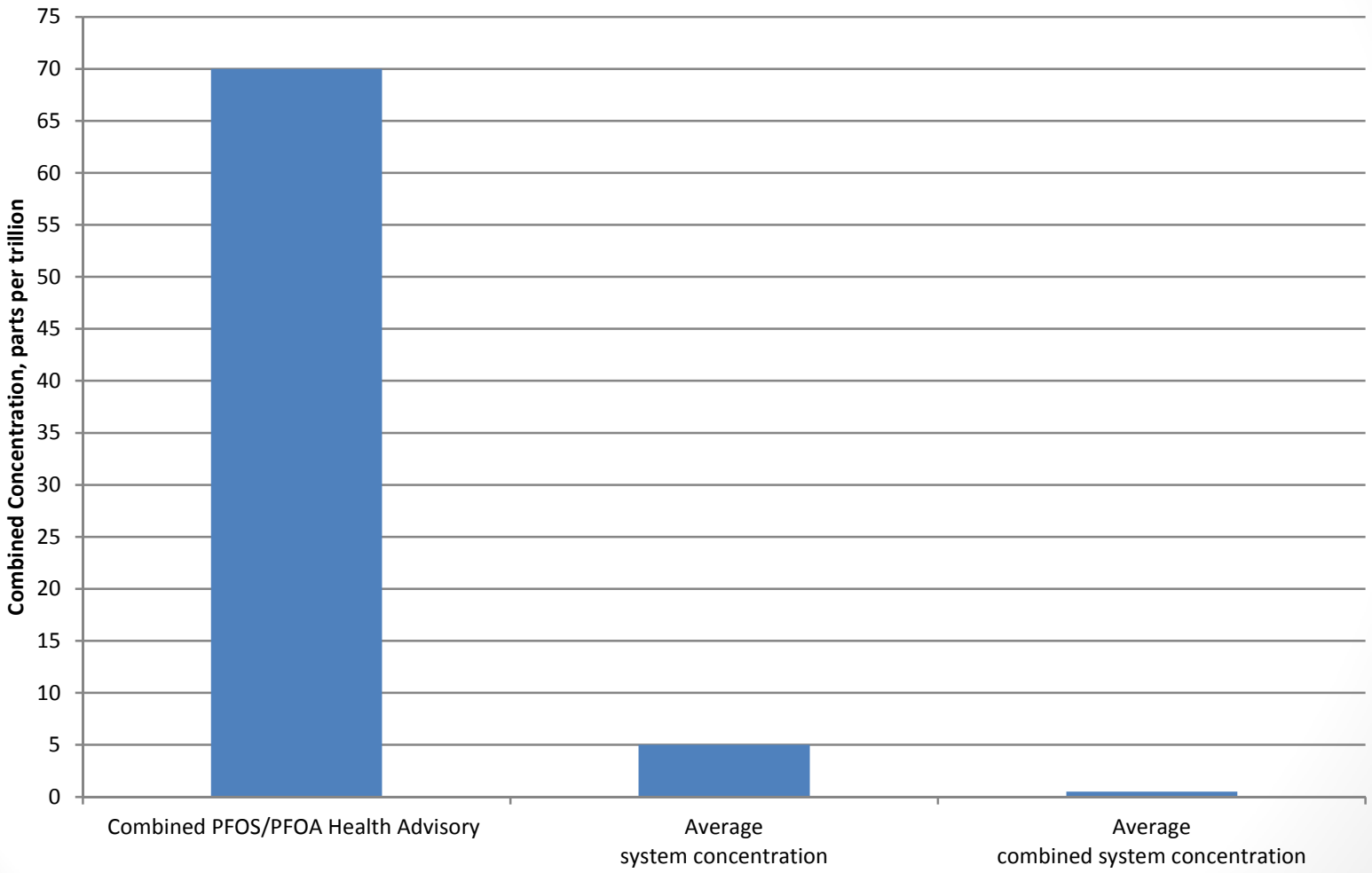
Well Water:

- 5 remediated wells plus Well 7

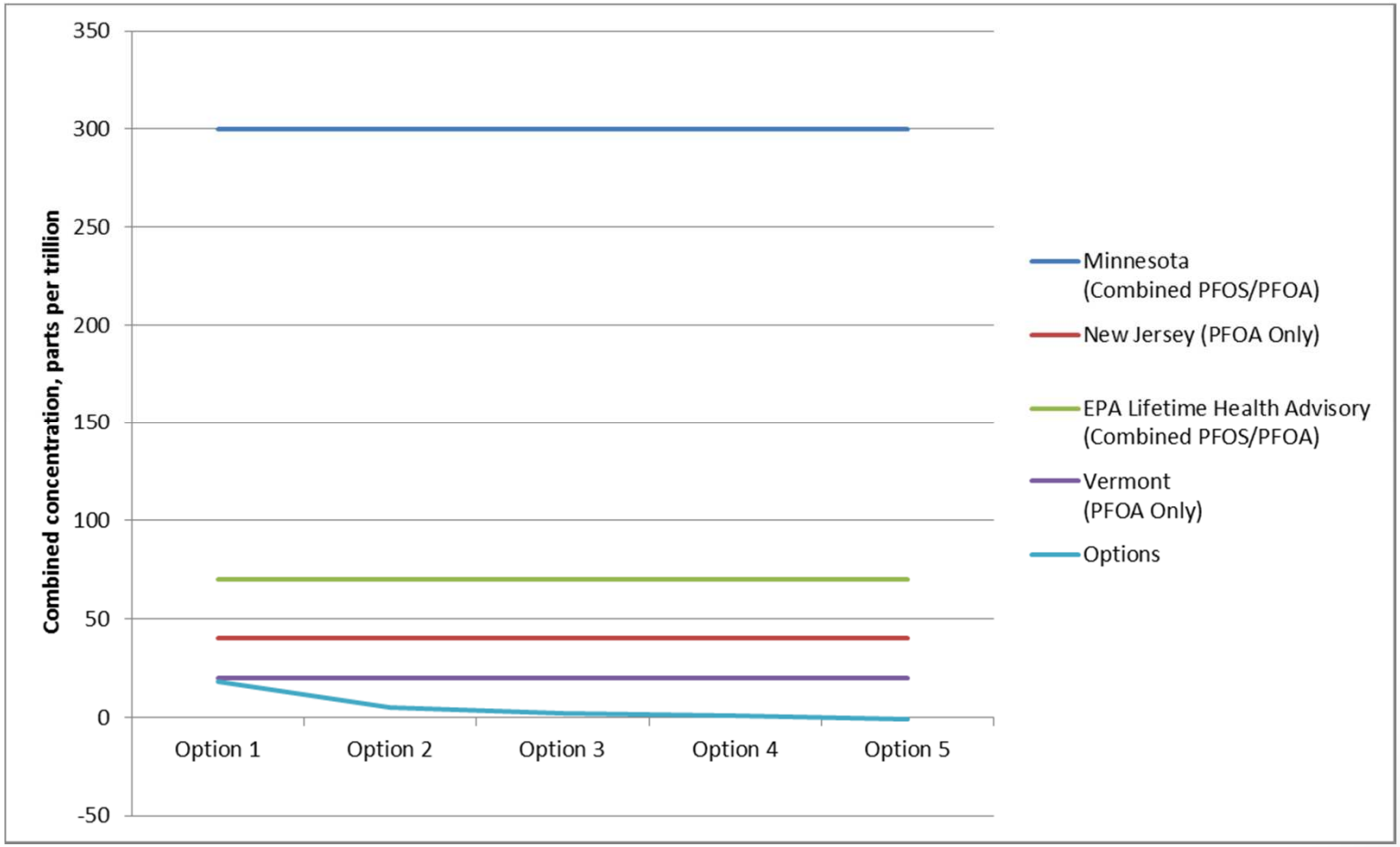
PFC Levels:

- Highest source in the system: 5 ppt
- System average: approximately less than 1 ppt
- Percentage of EPA LHAL: approximately ¾ of 1%

Option Five Highest & Average Combined PFOS/PFOA Concentration in System



Options One through Five PFOS/PFOA Average Concentrations in Horsham Water Supply as Compared to Federal, State & Local Reference Levels



Remediation Costs

- The Navy has currently committed to pay for five permanent GAC units and three temporary GAC units on the five wells that exceed the EPA LHAL.
- Additional cost per day for Option One: none
- Additional cost per day for Option Two: $750
- Additional cost per day for Option Three: $1750
- Additional cost per day for Option Four: $2750
- Additional cost per day for Option Five: $2750-$3300

Possible Funding Sources

- The goal of Council and the HWSA is to ensure that those responsible for the PFCs, and not the rate-payers, pay the cost of remediation.
- The United States Navy and Air Force must pay to return our water to the state in which they found it.
- We will seek other sources of Federal and state funding.
- We will need the assistance of our Federal and State officials to secure this funding.

Long-Term Planning

The Township and HWSA are committed to continuing their efforts to provide water with the lowest possible levels of PFCs. While meeting the goals set for the end of this year, we will continue to explore the best method for remediating wells taken offline, in combination with increasing our purchase of water from other sources.

We will continue our planning, remaining flexible to address variables which are not known at this time. For example:

- The Navy testing and on-site remediation at the base may affect the PFC levels in our wells. We anticipate that the Navy remediation will help lower the PFC levels.

Long-Term Planning Variables (continued)

- Remediation efforts at the Air Force/ANG property may also have a positive effect on the PFC levels in our wells.
- We will continue a monitoring program on all wells to confirm the expected results.
- We will look at the possibility of connecting multiple wells to a single GAC filter.
- The combination of well remediation and purchased water must be constantly reevaluated to ensure cost-effective PFC reduction.
- We must continue to press for increased funding from the Navy, Air Force, and other Federal and State sources.

What About Private Wells?

- As of June 9, the Navy reports that they have tested 250 private wells in Horsham Township. 76 of those wells were above the EPA LHAL.
- HWSA is in the process of connecting many of these private wells to the public water system, and we estimate that all identified private drinking water wells desiring connection to the HWSA system will be connected by the end of the year.
- If you have a private well which has been affected by PFCs and are able to connect to public water, we urge you to do so.

Private Wells (continued)

- 100 additional wells are scheduled to be tested before the end of July.
- If you have a private well that has not been tested, please contact Eduardo Rivera at the EPA at 215-514-6887 immediately.

Point-of-Use (In Home) Filters

- EPA and PaDEP have not recommended any in-home filters as effective, however, EPA officials advise that in-home carbon filters have proven effective.

- In-home filters have not been certified because there is not sufficient data and testing specific to PFCs to provide homeowners with operation and maintenance guidelines. PFCs will accumulate in the carbon and the carbon needs to be replaced periodically.

- The Minnesota Department of Health performed a study of point-of-use filters and recommended 11 filters as effective. You may find it helpful to review the study at http://www.health.state.mn.us/divs/eh/wells/waterquality/poudevicefinal.pdf

Health Issues

- Council and the HWSA understand and share your concern with the effect of PFCs on our health and the health of our families. How will the water we already consumed affect our long-term health? Is the new LHAL sufficient to protect us?

- All experts agree that there are gaps in our understanding of PFCs, the most notable gap being the long-term health effects.

- Council arranged for CDC, EPA and other agencies to come here to hold a town hall meeting with our residents to answer these questions. That meeting will be held at the HH High School on August 15.

Blood Tests

- It essential that residents understand that PFCs are an emerging contaminant and no one knows what the results of the blood tests mean for your long-term health. Experts agree that PFCs accumulate in our bodies, but no one has been able to tell us, with certainty, at what level our health can be affected.

- The blood tests are currently useful only to provide a baseline for future blood tests.

- If blood tests become an option, each resident must decide for themselves and their families if the information gained from the tests outweighs the uncertainty.