

SUPPLEMENTAL PACKET



Afton Conceptual Project Options Memorandum

September 27, 2019

Community Background

Afton is a rural city designated as a Diversified Rural community by the Metropolitan Council and is located east of Woodbury. According to the community's Comprehensive Plan (Comp Plan), residents value their rural lifestyle and try to maintain it by regulating low residential housing densities not implementing public facilities that will encourage "urbanization". In Afton, most lots are a minimum of five acres, with many being substantially larger than five acres, and many being located among large agricultural properties and wooded ravines. On many of these large lots, the homes are setback 400 or more feet from the public road. Homes in the community are expected to provide on-site sewer and water and as such Afton has no public water system (PWS). While a small percentage of the city is designated for industrial use, the primary land uses are agriculture and rural residential.

For the year 2020, the community was anticipated to be have a population of 3070 and a 2040 population of 3140, which has been approved by the Metropolitan Council (Met Council). This growth is expected to be generated by the slow growth in homes on lots of five-acres or more.

According to available data from PFAS sampling, the northern border of Afton, adjacent to West Lakeland Township, is the only region that has seen PFAS levels with a Minnesota Department of Health (MDH) Health Index (HI) of greater than 1 as shown in Figure 1 below. The remaining areas of the community that have been sampled have detectable levels of PFAS contamination but do not have and HI of 1 or more. Afton is concerned that the extensive contamination in West Lakeland's southern region will continue to expand further south into Afton. As such, the community is highly concerned with plume movement and implication of any new municipal supply wells.

Commented [DE1]: Provide number of homes with GAC systems already installed.



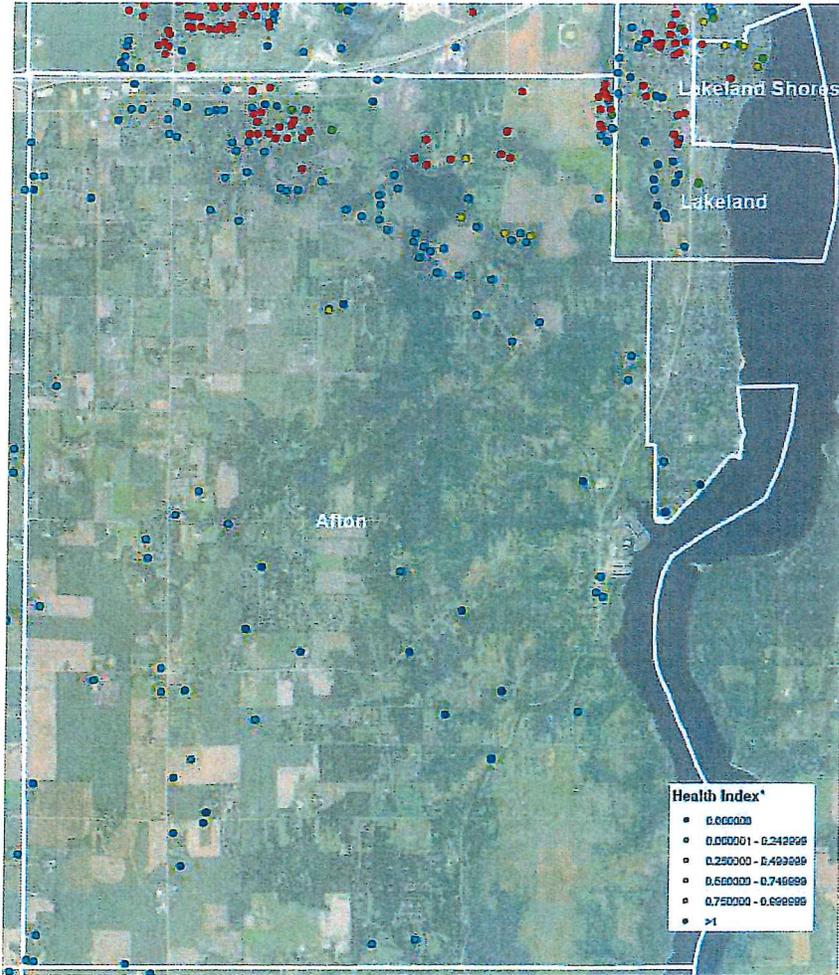


Figure 1: MDH HI Levels at Wells





Current and Proposed Community Conceptual Projects

As shown in Figure 1 above, Afton has several private wells along its northern border with West Lakeland that are above the MDH HI. However, at this time the City has not implemented or planned any projects to address the PFAS contamination. The City's proposed long-term plan is to address PFAS contamination through the installation of granular activated carbon (GAC) filter systems on individual private wells with PFAS concentrations that exceed health limits.

Comprehensive List of Potential Conceptual Projects

Initial discussions with Afton have provided insight into potential concept level projects that the City could implement to address PFAS contamination in their community. The following projects are not mutually exclusive, and it is possible that two or more may be suitable to meet the Community's needs.

Local Options for Afton:

1. Provide point of entry treatment (POET) systems for private wells and non-community public water systems:
 - a. Afton 1: Afton has approximately 676 private wells and 34 have exceeded the HI value of 1. Afton could implement POET systems on all affected wells. This option would be a good fit for wells that are not located near a PWS and where the number of private wells does not justify the costs of connecting to an existing PWS or implementing a small rural water supply system. This option could be an interim or long-term solution and is being implemented for those private wells that have HI values greater than 1 and have requested such treatment systems (such as GAC POET systems) from MPCA.
2. Implement rural water supply systems for small residential communities:

Afton could implement small rural water supply systems for PFAS impacted areas that would supply residents with treated groundwater from a shared well. The consideration for this would be the cost tradeoff of this option as opposed to individual POET systems and resident/community preference. Areas that could potentially be considered for a small rural water supply system are listed below. The communities below are located at the northern border of Afton which show PFAS contamination levels with a HI of 1 or more.

 - a. Afton 2a: One location for a small rural water system is identified East of Indian Trail and Tomahawk Drive. For this five-home community, one treated groundwater well is required. Figure 2 below shows the location and estimates the 2" diameter PVC piping required to create this community to be approximately 1,440-ft.

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Commented [HB3]: City to verify

Commented [DE4]: Have data and will update



Figure 2: Small rural water supply system for Five Homes



- b. Afton 2b: Another potential small rural water system South of Tomahawk Lane and Tomahawk Drive. The location in Figure 3 below approximates the use of 2,920-ft of 2" diameter PVC pipe. This eight-home community requires the use of one shared, treated groundwater well.



Figure 3: Small rural water supply system for Eight Homes

- c. Afton 2c: A small rural water system using two shared, treated groundwater wells to supply 10 homes requires approximately 2,640-ft of 2" diameter PVC piping. One example small rural water supply system is identified South Division Street on Croixview Ave, as shown in Figure 4 below.



Figure 4: Small rural water supply system for 10 Homes

- d. Afton 2d: For a small rural water system supplying 20 homes, two treated groundwater wells are required. The example in Figure 5 below shows 6,480-ft of 4" diameter PVC piping is required to supply 20 homes on Tomahawk Dive South and Tomahawk Lane South.



Figure 5: Small rural water supply system for 20 Homes



3. Install a new surface water treatment plant off the St. Croix River:
 - a. Afton 3: While this is a technically feasible it is the least administratively feasible option. Administratively, there are challenges with permitting to use St. Croix as a water source that could take 3-5 years to resolve. The town has stated that they do not have the resources to support a new treatment facility. In addition, this option would require Afton to implement a public water supply system. If this were to be considered, this option would then need to be compared to the option of connecting to another neighborhood as part of a regional solution. As a result, a surface water treatment plant may be infeasible for Afton alone but could be evaluated as part of a regional surface water option considered in the following section.

Regional Options for Afton:

1. Connecting private wells to existing public water system (PWS):
 - a. Afton – Lakeland 1: In order to connect to a neighboring system such as Lakeland, Afton would need to install a PWS. Lakeland has previously offered to serve the downtown area and bordering communities of Afton; however, the City of Afton is hesitant to implement a PWS if it is owned and operated by another community, as there are concerns regarding what a regional agreement would entail and what the cost would mean to residents. However, the City of Afton is more receptive to this idea than owning, operating, and maintaining their own treatment facility due to the availability of resources. In addition, if Afton and Lakeland were to interconnect, the City of Lakeland would need to drill new wells to meet the additional demand. Varying topography (100+ feet) between Lakeland and neighboring communities would have to be considered and pump stations may be required.
 - b. Afton – Woodbury 1: Afton could tie into the neighboring system of Woodbury by extending a water main along Hudson Rd S to the pocket of contaminated private wells on the north end of the City (refer to Figure 3 below).

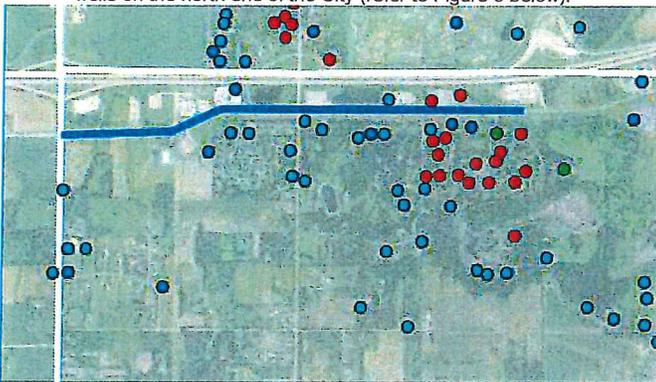


Figure 6: Connection to Woodbury's PWS.

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- c. West Lakeland – Afton 1: If Afton developed a PWS to provide water to its northern region, West Lakeland could tie into Afton's system. West Lakeland would need to install new infrastructure.

Commented [ABH6]: Low feasibility



AFTON CREEK PRESERVE

PROPOSED DRAINAGE AREAS

- Pond vs infiltration basin designations per plans dated 5-23-19
 - HWLs based on proposed HydroCAD report dated 4-5-19

P2a - forebay - not designed to retain runoff
 HWLs:
 - 2-yr: 890.32'
 - 10-yr: 892.34'
 - 100-yr: 899.78'

P3a - forebay - not designed to retain runoff
 HWLs:
 - 2-yr: 917.05'
 - 10-yr: 917.68'
 - 100-yr: 919.39'

P4a - forebay - not designed to retain runoff
 HWLs:
 - 2-yr: 905.89'
 - 10-yr: 906.67'
 - 100-yr: 908.30'

P4c - forebay - not designed to retain runoff
 HWLs:
 - 2-yr: 899.28'
 - 10-yr: 899.73'
 - 100-yr: 901.41'

P03 - forebay - not designed to retain runoff
 HWLs:
 - 2-yr: 896.20'
 - 10-yr: 897.05'
 - 100-yr: 899.46'

P4b - infiltration basin
 HWLs:
 - 2-yr: 898.24'
 - 10-yr: 899.34'
 - 100-yr: 901.48'

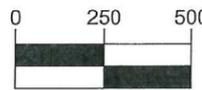
P5 - wet pond (NURP)
 NWL: 904.50'
 HWLs:
 - 2-yr: 904.56'
 - 10-yr: 905.11'
 - 100-yr: 905.93'

P7 - infiltration basin
 HWLs:
 - 2-yr: 869.01'
 - 10-yr: 870.20'
 - 100-yr: 871.05'

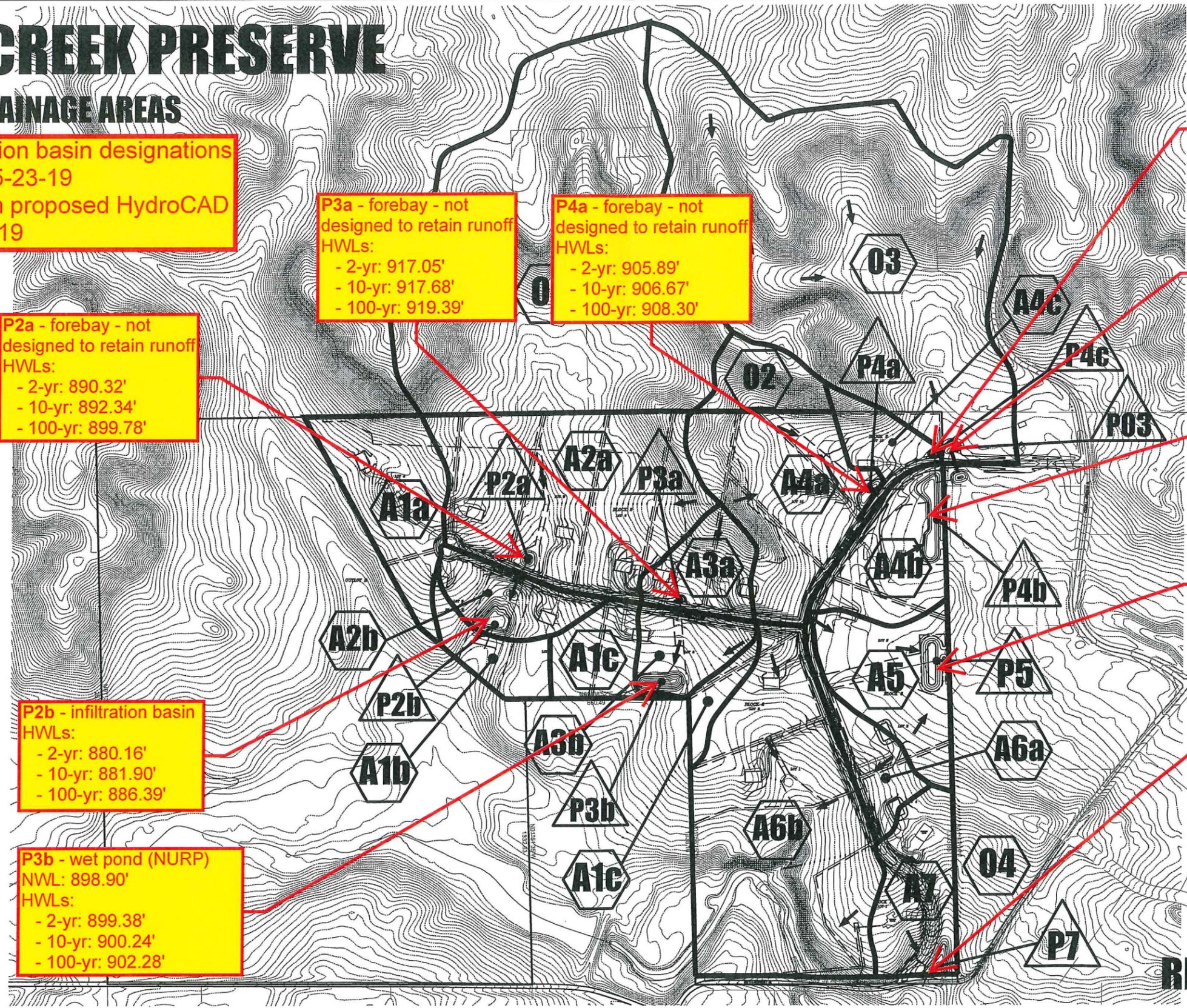
P2b - infiltration basin
 HWLs:
 - 2-yr: 880.16'
 - 10-yr: 881.90'
 - 100-yr: 886.39'

P3b - wet pond (NURP)
 NWL: 898.90'
 HWLs:
 - 2-yr: 899.38'
 - 10-yr: 900.24'
 - 100-yr: 902.28'

NORTH



1 INCH = 500 FEET



~~2/5/2018~~
~~REV. 10/3/2018~~
REV. 10/29/2018