

**Town of Harvard  
Water and Sewer Commission  
13 Ayer Road  
Harvard, Massachusetts 01451**

To: Select Board

From: Water/Sewer Commission

Date: June 21, 2022

As you know, Harvard's water system was once again hit with coliform bacteria last summer. This was the second time in as many years. This incident placed us in an untenable position of having to address the matter to prevent it from occurring again. As you are aware, the Massachusetts Department of Environmental Protection (DEP), has required the Town of Harvard to come up with a plan to deal with this matter both in the short-term and the long-term.

In our memo dated February 23, the Water Commissioners recommended that the Select Board proceed with the short-term response proposed by our engineer, Tom Mahanna of Tighe & Bond. The Select Board approved the design and installation of a temporary water chlorination system along with the required changes to water piping, in the well head area, to allow the chlorinated water more contact time prior to initial distribution on Pond Road. This phase was started and is expected to be completed by the end of August.

Our February 23 memo also recommended that the Town apply for funding from the State SRF loan program for a more permanent solution. The proposed long-term responses are (1) building and operating our own water filtration plant (chlorination and PFAS treatment) or (2) connecting to Devens' water system as allowed by Chapter 498. Each of these options has its own their own long-term and short-term, costs.

In making a recommendation to the Select Board, the Water Commissioners have compared the following:

1. Construction Cost
2. Cost of Operation
3. Benefits to the town

**Construction Cost**

Tighe & Bond has prepared estimates of the cost for design and construction of each of the two options. The town owned system would include a new masonry building housing treatment facilities, including PFAS treatment. The Devens Connection would include a pump station and a new water line coming up Depot Road to Ayer Road. The construction cost estimates, which are of course very preliminary, are as follows:

Construction of Town Operated Treatment Plant	\$3,300,000
Connection to Devens Water System	\$4,224,000

### Cost of Operation

Connecting to Devens does not mean we will not need our Water Commission or that we will not be responsible for our own water infrastructure. We will still be responsible for both as we will still provide water bills to our customers, maintain our water lines, and address issues with our water tank when needed. We will pay a single monthly/quarterly bill to Devens. However, we will not have costs or responsibility of operation and improvement of a water system, or of maintaining the quality and availability of water.

Town Operation of a system served by a new plant would require the Town to hire two individuals with T2 licensing or above and incur all the costs associated with that. It would result in continuing costs for chemicals, carbon, utilities and disposal, and would put the Town in a position of having to comply with future changes in DEP regulations. Additionally, the Town would have to deal with its need to site, drill and permit an additional well.

Tom Mahanna has prepared estimates of the operations costs of each option. These estimates are attached. They include payments on the construction loan, operation and maintenance of the system, and cost of purchased water. Over twenty years, the total estimated operating cost to the Town of each option is as follows:

Town Operated Treatment Plant	\$7,160,889*
Connection to Devens Water System	\$6,237,037

\*this does not include the need for a new town well or any OPEB costs associated with the added positions

### Benefits to the Town

We believe that a connection to the Devens Water System would provide many benefits to the Town, including:

1. Increased fire protection,
2. Potential for increased capacity; the ability to add users abutting the new system and the ability to expand the Town Center water system.
3. Free the Town of the risks and complexity of operation of a town run water system

For the reasons stated above the Water/Sewer Commission recommends that the Select Board vote to approve moving forward with the connection to Devens as the best long-term solution for the Town of Harvard.



Town of Harvard  
 DEVENS INTERCONNECTION  
 ANALYSIS OF CONSTRUCTION OF TREATMENT FACILITY VS. PURCHASING WATER  
 June 17, 2022

CONSTRUCT NEW WATER TREATMENT FACILITY AT POND ROAD

Year	Principal	Interest	Total Loan Payment	Remaining Loan Balance	O&M Budget (New Facility)	Existing Operations Expense*	Additional Operator	Total Annual Cost
2022				\$3,300,000				\$0
2023	\$165,000	\$99,000	\$264,000	\$3,135,000	\$30,000	\$25,000	\$50,000	\$169,000
2024	\$165,000	\$94,050	\$259,050	\$2,970,000	\$30,000	\$25,750	\$51,500	\$167,200
2025	\$165,000	\$89,100	\$254,100	\$2,805,000	\$31,827	\$26,523	\$53,045	\$165,495
2026	\$165,000	\$84,150	\$249,150	\$2,640,000	\$32,782	\$27,318	\$54,636	\$163,886
2027	\$165,000	\$79,200	\$244,200	\$2,475,000	\$33,765	\$28,138	\$56,275	\$162,378
2028	\$165,000	\$74,250	\$239,250	\$2,310,000	\$34,778	\$28,982	\$57,964	\$160,974
2029	\$165,000	\$69,300	\$234,300	\$2,145,000	\$35,822	\$29,851	\$59,703	\$159,675
2030	\$165,000	\$64,350	\$229,350	\$1,980,000	\$36,896	\$30,747	\$61,494	\$158,487
2031	\$165,000	\$59,400	\$224,400	\$1,815,000	\$38,003	\$31,669	\$63,339	\$157,411
2032	\$165,000	\$54,450	\$219,450	\$1,650,000	\$39,143	\$32,619	\$65,239	\$156,451
2033	\$165,000	\$49,500	\$214,500	\$1,485,000	\$40,317	\$33,598	\$67,196	\$155,611
2034	\$165,000	\$44,550	\$209,550	\$1,320,000	\$41,527	\$34,606	\$69,212	\$154,895
2035	\$165,000	\$39,600	\$204,600	\$1,155,000	\$42,773	\$35,644	\$71,288	\$154,305
2036	\$165,000	\$34,650	\$199,650	\$990,000	\$44,056	\$36,713	\$73,427	\$153,846
2037	\$165,000	\$29,700	\$194,700	\$825,000	\$45,378	\$37,815	\$75,629	\$153,522
2038	\$165,000	\$24,750	\$189,750	\$660,000	\$46,739	\$38,949	\$77,898	\$153,337
2039	\$165,000	\$19,800	\$184,800	\$495,000	\$48,141	\$40,118	\$80,235	\$153,294
2040	\$165,000	\$14,850	\$179,850	\$330,000	\$49,585	\$41,321	\$82,642	\$153,399
2041	\$165,000	\$9,900	\$174,900	\$165,000	\$51,073	\$42,561	\$85,122	\$153,655
2042	\$165,000	\$4,950	\$169,950	\$0	\$52,605	\$43,838	\$87,675	\$154,068
2043	\$165,000	\$0	\$165,000	\$0	\$54,199	\$45,161	\$90,330	\$154,655
TOTALS	\$1,300,000	\$1,039,500	\$4,339,500	\$0	\$806,111	\$674,759	\$1,343,519	\$7,160,899

Estimated Average Annual Cost: \$588,044

\*Note: Well testing, power, heat, maintenance existing vault

ESTIMATED PROJECT COSTS:

Land Purchase or Easement Costs	\$0
Construction Costs (8,500 l.f. of 12" water main, and meter building)	\$2,500,000
Engineering Allowance (20%)	\$500,000
Contingency (10%)	\$300,000
<b>Total Estimated Project Cost</b>	<b>\$3,300,000</b>

LOAN CRITERIA:

Estimated Project Cost	\$3,300,000
Assumed Grant (%)	0%
Assumed Grant (\$)	\$0
Loan Value	\$3,300,000
Loan Interest Rate	3.00%
Loan Term (years)	20

PURCHASE WATER\*

Year	Water Charges Debits	Town Water Cost (60%)	Net Annual Water Purchase Costs	Cumulative Water Purchase Costs	Analysis Year
2022	\$0	\$0	\$0	\$0	1
2023	\$0	\$0	\$0	\$0	2
2024	\$0	\$0	\$0	\$0	3
2025	\$0	\$0	\$0	\$0	4
2026	\$0	\$0	\$0	\$0	5
2027	\$0	\$0	\$0	\$0	6
2028	\$0	\$0	\$0	\$0	7
2029	\$0	\$0	\$0	\$0	8
2030	\$0	\$0	\$0	\$0	9
2031	\$0	\$0	\$0	\$0	10
2032	\$0	\$0	\$0	\$0	11
2033	\$0	\$0	\$0	\$0	12
2034	\$0	\$0	\$0	\$0	13
2035	\$0	\$0	\$0	\$0	14
2036	\$0	\$0	\$0	\$0	15
2037	\$0	\$0	\$0	\$0	16
2038	\$0	\$0	\$0	\$0	17
2039	\$0	\$0	\$0	\$0	18
2040	\$0	\$0	\$0	\$0	19
2041	\$0	\$0	\$0	\$0	20
2042	\$0	\$0	\$0	\$0	20
2043	\$0	\$0	\$0	\$0	20
TOTALS	\$0	\$0	\$0	\$0	

Estimated Average Annual Cost: \$0

\*Note: Water charges are increased 3% every 3 years

Town of Harvard  
**DEVENS INTERCONNECTION**  
**ANALYSIS OF CONSTRUCTION OF TREATMENT FACILITY VS. PURCHASING WATER**  
 June 17, 2022

**CONSTRUCT NEW WATER SYSTEM INTERCONNECTION WITH DEVENS**

Year	Principal	Interest	Total Loan Payment	Remaining Loan Balance	OBM Budget (New Facility)	Existing Operations Expense*	Additional Operator	Total Annual Cost
2022				\$4,224,000				\$0
2023	\$211,200	\$126,720	\$337,920	\$4,012,800	\$10,000	\$5,000	\$0	\$347,920
2024	\$211,200	\$120,384	\$331,584	\$3,801,600	\$10,300	\$5,150	\$0	\$341,884
2025	\$211,200	\$114,048	\$325,248	\$3,590,400	\$10,600	\$5,305	\$0	\$335,857
2026	\$211,200	\$107,712	\$318,912	\$3,379,200	\$10,927	\$5,464	\$0	\$329,839
2027	\$211,200	\$101,376	\$312,576	\$3,168,000	\$11,255	\$5,628	\$0	\$323,831
2028	\$211,200	\$95,040	\$306,240	\$2,956,800	\$11,593	\$5,796	\$0	\$317,833
2029	\$211,200	\$88,704	\$299,904	\$2,745,600	\$11,941	\$5,970	\$0	\$311,845
2030	\$211,200	\$82,368	\$293,568	\$2,534,400	\$12,299	\$6,149	\$0	\$305,867
2031	\$211,200	\$76,032	\$287,232	\$2,323,200	\$12,668	\$6,334	\$0	\$299,900
2032	\$211,200	\$69,696	\$280,896	\$2,112,000	\$13,048	\$6,524	\$0	\$293,944
2033	\$211,200	\$63,360	\$274,560	\$1,900,800	\$13,439	\$6,720	\$0	\$287,999
2034	\$211,200	\$57,024	\$268,224	\$1,689,600	\$13,842	\$6,921	\$0	\$282,066
2035	\$211,200	\$50,688	\$261,888	\$1,478,400	\$14,258	\$7,129	\$0	\$276,146
2036	\$211,200	\$44,352	\$255,552	\$1,267,200	\$14,685	\$7,343	\$0	\$270,237
2037	\$211,200	\$38,016	\$249,216	\$1,056,000	\$15,126	\$7,563	\$0	\$264,342
2038	\$211,200	\$31,680	\$242,880	\$844,800	\$15,580	\$7,790	\$0	\$258,460
2039	\$211,200	\$25,344	\$236,544	\$633,600	\$16,047	\$8,024	\$0	\$252,591
2040	\$211,200	\$19,008	\$230,208	\$422,400	\$16,528	\$8,264	\$0	\$246,736
2041	\$211,200	\$12,672	\$223,872	\$211,200	\$17,024	\$8,512	\$0	\$240,896
2042	\$211,200	\$6,336	\$217,536	\$0	\$17,535	\$8,768	\$0	\$235,071
2043	\$211,200	\$0	\$211,200	\$0	\$18,104	\$9,036	\$0	\$229,264
<b>TOTALS</b>	<b>\$4,224,000</b>	<b>\$1,330,560</b>	<b>\$5,554,560</b>		<b>\$288,704</b>		<b>\$0</b>	<b>\$5,833,264</b>

Estimated Average Annual Cost: \$291,163

\*Note: Well testing, power, heat, maintenance existing vault

**ESTIMATED PROJECT COSTS:**

Land Purchase or Easement Costs	\$0
Construction Costs (8,500 l.f. of 12" water main, and meter building)	\$3,200,000
Engineering Allowance (20%)	\$640,000
Contingency (10%)	\$384,000
<b>Total Estimated Project Cost</b>	<b>\$4,224,000</b>

**LOAN CRITERIA:**

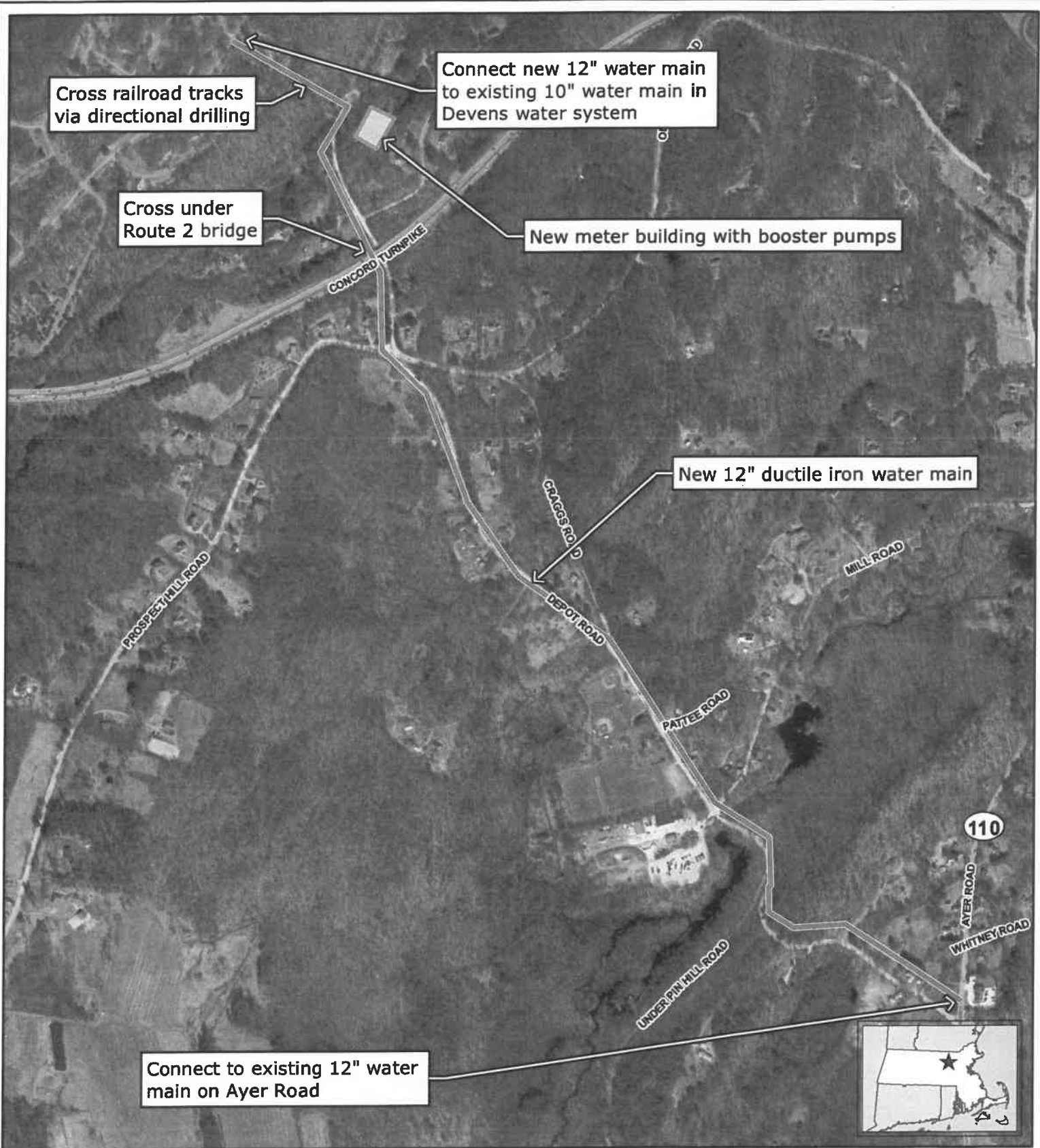
Estimated Project Cost	\$4,224,000
Assumed Grant (%)	0%
Assumed Grant (\$)	\$0
Loan Value	\$4,224,000
Loan Interest Rate	3.00%
Loan Term (years)	20

**PURCHASE WATER\***

Year	Water Charges Devens	Town Water Cost (60%)	Net Annual Water Purchase Costs	Cumulative Water Purchase Costs	Analysis Year
2022	\$30,000	\$18,000	\$18,000	\$18,000	1
2023	\$30,000	\$18,000	\$18,000	\$36,000	2
2024	\$30,000	\$18,000	\$18,000	\$54,000	3
2025	\$30,000	\$18,540	\$18,540	\$72,540	4
2026	\$30,000	\$19,080	\$19,080	\$91,080	5
2027	\$30,000	\$19,620	\$19,620	\$109,620	6
2028	\$31,827	\$19,096	\$19,096	\$128,716	7
2029	\$31,827	\$19,096	\$19,096	\$147,812	8
2030	\$31,827	\$19,096	\$19,096	\$166,909	9
2031	\$32,782	\$19,669	\$19,669	\$186,578	10
2032	\$32,782	\$19,669	\$19,669	\$206,247	11
2033	\$32,782	\$19,669	\$19,669	\$225,916	12
2034	\$33,765	\$20,259	\$20,259	\$246,175	13
2035	\$33,765	\$20,259	\$20,259	\$266,434	14
2036	\$33,765	\$20,259	\$20,259	\$286,693	15
2037	\$34,778	\$20,867	\$20,867	\$307,560	16
2038	\$34,778	\$20,867	\$20,867	\$328,427	17
2039	\$35,822	\$21,493	\$21,493	\$349,294	18
2040	\$35,822	\$21,493	\$21,493	\$370,787	19
2041	\$35,822	\$21,493	\$21,493	\$392,280	20
<b>TOTALS</b>	<b>\$689,632</b>	<b>\$413,773</b>	<b>\$413,773</b>		

Estimated Average Annual Cost: \$19,703

\*Note: Water charges are increased 3% every 3 years

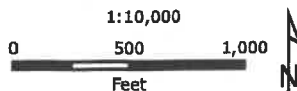


**Legend**

-  Proposed 12" Ductile Iron Water Main
-  New Meter Building

**Tighe & Bond**

Based on MassGIS Color Orthophotography (2021)



**HARVARD - DEVENS  
WATER SYSTEM  
INTERCONNECTION PLAN**

Depot Road  
Harvard, Massachusetts

May 2022







## **Drinking Water Health Advisories for PFAS Fact Sheet for Communities**

On June 15, 2022, EPA released four drinking water health advisories for per- and polyfluoroalkyl substances (PFAS). In releasing these drinking water health advisories, EPA is acting in accordance with its mission and responsibility to protect public health and keep communities informed when new science becomes available. EPA is committed to partnering with states, Tribes, territories, and water utilities, and the agency's new health advisories represent a key input that can be used to inform actions to address PFAS in drinking water, including water quality monitoring, changing sources of drinking water or modifying treatment to reduce exposure to these substances. EPA also announced that it is inviting states and territories to apply for \$1 billion – the first of \$5 billion in Bipartisan Infrastructure Law grant funding – to address PFAS and other emerging contaminants in drinking water, specifically in small or disadvantaged communities.

### **What are PFAS?**

PFAS are a group of manufactured chemicals that have been used in industry and consumer products since the 1940s. There are thousands of different PFAS, some of which have been more widely used and studied than others. One common concern is that PFAS generally break down very slowly, meaning that concentrations can accumulate in people, animals, and the environment over time.

Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) are two of the most widely used and studied chemicals in the PFAS group. PFOA and PFOS have been replaced in the United States with other PFAS in recent years. In chemical and product manufacturing, GenX chemicals are considered a replacement for PFOA, and perfluorobutane sulfonate (PFBS) is considered a replacement for PFOS.

### **What Is a Health Advisory?**

Drinking water health advisories provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA's health advisories are non-enforceable and non-regulatory and provide technical information to states agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contamination.

EPA's lifetime health advisories identify levels to protect all people, including sensitive populations and life stages, from adverse health effects resulting from exposure throughout their lives to these PFAS in drinking water. The health advisory levels were calculated to offer a margin of protection against adverse health effects. EPA's lifetime health advisories also take into account other potential sources of exposure to these PFAS beyond drinking water (for example, food, air, consumer products, etc.), which provides an additional layer of protection.

### **What Is the Basis for EPA's New Health Advisories?**

The interim updated health advisories for PFOA and PFOS are based on human studies in populations exposed to these chemicals. Human studies have found associations between PFOA and/or PFOS

exposure and effects on the immune system, the cardiovascular system, human development (e.g., decreased birth weight), and cancer. The final health advisories for GenX chemicals and PFBS are based on animal studies following oral exposure to these chemicals. GenX chemicals have been linked to health effects on the liver, the kidney, the immune system, and developmental effects, as well as cancer. PFBS has been linked to health effects on the thyroid, reproductive system, development, and kidney.

### **Why is EPA Issuing Interim Updated Health Advisories for PFOA and PFOS?**

Consistent with EPA's mission and responsibility to protect public health and keep communities informed when new science becomes available, EPA is issuing interim updated health advisories for PFOA and PFOS in light of new scientific information on these chemicals' health effects. These interim health advisories will be in place until EPA's forthcoming PFAS National Primary Drinking Water Regulation is in effect.

### **What are the Health Advisory Levels?**

- Interim updated Health Advisory for PFOA = 0.004 parts per trillion (ppt)
- Interim updated Health Advisory for PFOS = 0.02 ppt
- Final Health Advisory for GenX chemicals = 10 ppt
- Final Health Advisory for PFBS = 2,000 ppt

### **What Does this Mean for Communities?**

The agency recognizes that these new health advisories may raise many questions. EPA encourages people who are concerned to learn about PFAS, including actions that may already be underway and opportunities to reduce exposure. EPA has created [answers to a list of important questions](#) related to this announcement to help members of the public learn more.

If you are concerned about PFAS in your drinking water, EPA recommends you contact your local water utility to learn more about your drinking water and to see whether they have monitoring data for PFAS or can provide any specific recommendations for your community. EPA recommends that public water systems that find PFOA or PFOS in their drinking water take steps to inform customers, undertake additional sampling to assess the level, scope, and source of contamination, and examine steps to limit exposure.

In many communities, public health officials have taken steps to reduce exposure to PFAS in drinking water. Current science indicates that **lower levels of PFAS exposure present less risk**, so those efforts help protect public health.

**Drinking water systems have reduced exposure to PFAS** by closing contaminated wells, changing the rates of blending of water sources, or installing technologies that remove PFAS from the water (such as granular activated carbon or reverse osmosis).

### **If you are concerned about PFAS in your drinking water:**

- Learn about testing and actions your water system may have taken, or request testing.
- If you have a home drinking water well, ensure you are protecting and maintaining it: <https://www.epa.gov/ground-water-and-drinking-water>
- Consider any resources and recommendations from your state: <https://www.epa.gov/pfas/us-state-resources-about-pfas>

- **Review EPA’s Meaningful and Achievable Steps You Can Take to Reduce Your Risk:**  
<https://www.epa.gov/pfas/meaningful-and-achievable-steps-you-can-take-reduce-your-risk>
- **Review EPA’s questions and answers about these drinking water health advisories:**  
<https://www.epa.gov/sdwa/questions-and-answers-drinking-water-health-advisories-pfoa-and-pfos>
- **Follow EPA’s progress in developing a PFAS National Drinking Water Regulation:**  
<https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>
- **Learn about EPA funding through the Bipartisan Infrastructure Law to reduce PFAS in water:**  
<https://www.epa.gov/dwcapacity/wiin-grant-emerging-contaminants>.
- **Learn more about PFAS and review the agency’s PFAS Strategic Roadmap:**  
<https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>

\* List of Acronyms: Per- and poly-fluoroalkyl substances (PFAS); Perfluorooctanoic Acid (PFOA); Perfluorooctane Sulfonic Acid (PFOS); Perfluorobutane Sulfonic Acid and its Potassium Salt (PFBS); Hexafluoropropylene Oxide (HFPO) Dimer Acid and its Ammonium Salt (GenX Chemicals)

