Iowa Department of Natural Resources

Summary of PFAS Testing of Public Water Supplies (Tiers 1-3)

March 3, 2023 | Claire Hruby, Matthew Graesch, James Warren, and Corey McCoid

Introduction

Perfluoroalkyl substances (PFAS) are a group of thousands of fluorinated organic compounds that consist of chains of carbon atoms bonded to fluorine atoms. The strength of the chemical bonds makes these compounds very difficult to break. Because they are hard to break down, these compounds can persist in the environment and accumulate in living organisms, including people.

Research on the health effects of PFAS on humans is ongoing. To date, studies indicate that exposures to certain PFAS compounds may have the following effects:

- Affect growth, learning, and behavior of infants and older children
- Interfere with ability to become pregnant
- Increase risk of high blood pressure and pre-eclampsia in pregnant women
- Increase cholesterol levels
- Increase cancer risk (kidney and testicular)
- Cause changes in liver enzymes
- Suppress immune responses
- Interfere with pancreatic, thyroid, and liver function

Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), have been the most extensively produced and studied of these chemicals. These compounds each have chains of eight carbon atoms, and are considered “long-chain” compounds. They have been used to make carpets, clothing, fabrics for furniture, paper packaging for food and other materials (e.g., cookware) that are resistant to water, grease or stains. They have also been used for firefighting and in a number of industrial processes. Between 2000 and 2002, PFOS was voluntarily phased out of production in the United States by its primary manufacturer. In 2006, eight major companies voluntarily agreed to phase out their global production of PFOA and PFOA-related chemicals, although there are a limited number of ongoing uses. In general, shorter chain compounds have been used to replace the longer-chain PFAS. These shorter chain compounds are believed to be less toxic.

PFAS compounds can be transported via air or water, potentially contaminating drinking water sources. Consumer products and food are a significant source of exposure to these chemicals for most people, and drinking water can be an additional source in communities where these chemicals have contaminated water supplies.

Overview

In January of 2020, the DNR released Iowa’s PFAS Action Plan, which prioritized actions that would help to minimize Iowan’s exposure to PFAS via drinking water. These actions included identifying locations where PFAS may have been used or stored, identifying drinking water sources at risk of contamination, and testing of public drinking water systems. If PFAS were detected above levels of certain thresholds, future actions could include contaminated site investigations and clean-up. Also, DNR planned to apply the information learned from statewide monitoring to voluntary private well testing programs.

The U.S. Environmental Protection Agency (EPA) has the authority to set nationwide health advisory (HA) levels for drinking-water contaminants. A lifetime HA is the level, or amount, below which no harm is expected from exposure to these chemicals over a lifetime. In 2016, EPA established lifetime HAs for PFOA and PFOS. The lifetime HA level was 70 parts per trillion (ppt) for PFOA and PFOS individually or combined. One part per trillion is equivalent to one nanogram per liter (ng/L), which is how the results are usually reported by laboratories. For perspective, one part per trillion (or nanogram per liter) is the equivalent of one drop of water in twenty Olympic-sized swimming pools.

In July of 2022, after DNR's PFAS monitoring had begun, EPA revised the lifetime HAs downward to 0.004 ppt for PFOA and 0.02 for PFOS. In addition, EPA set new HAs for perfluorobutane sulfonic acid (PFBS) at 2,000 ppt, and GenX chemicals (including HFPO DA) at 10 ppt. The new HAs for PFOA and PFOS are now below the level at which commercial laboratories can measure them. Depending on the laboratory and the specific PFAS compound, detection limits using EPA Method 533 range from 1.7-20 ppt or ng/L.

In 2021, DNR developed a process to prioritize sampling of public drinking water systems based on potential PFAS source locations, risk of contamination reaching the water source, and proximity to water supply wells. A tiered approach to sampling began with public drinking water sources in October 2021. The results of this sampling, which concluded in December 2022, are described in this report followed by a discussion of actions that resulted from this testing, and the prospects for future sampling efforts. Sampling of Tier 1-3 directly tested drinking water supplies representing 46% of Iowa's population according to the 2020 census numbers. The actual population represented by this sampling effort is significantly greater given that many communities purchase water from the supplies tested.

Prioritized Locations

The PFAS Action Plan prioritized testing of public water systems based on the likelihood that their source waters would be impacted by PFAS. Testing sites were chosen using locations of potential PFAS use and susceptibility of the water source to contamination from surface activities. Susceptibility of wells in Iowa is defined using the thickness of protective impermeable sediments or rock (confining layers) that lie above the layer from which water is drawn (the aquifer). The DNR's Source Water Protection Program defines susceptibility as follows:

- Highly susceptible: less than 25 feet confining layer thickness
- Susceptible: 25 to 50 feet confining layer thickness
- Slightly susceptible: 51 to 100 feet confining layer thickness
- Low susceptibility: more than 100 feet confining layer thickness

In the first tier (Tier 1) of samples, DNR identified 38 public water supplies that either used surface waters as their water source (22 supplies), or used groundwater sources (16 supplies) that have little natural protection (highly susceptible) and are within ½ mile of a potential PFAS source. The second tier (Tier 2) of samples expanded to wells within 1 mile of a potential PFAS source and wells that draw from slightly more protected aquifers (susceptible) within ½ mile of a potential source (40 water supplies). The third tier (Tier 3) of samples focused on wells that had potential PFAS sources within their 2, 5 or 10-year capture zones including locations listed in EPA's ECHO data and locations of recent biosolids application, vulnerable wells along the Mississippi River, wells in close proximity to Superfund sites, and wells in locations where previous results indicated the potential for PFAS contamination. In a few cases, the wells chosen for sampling were unavailable at the time of sampling, and these wells were replaced, sometimes with less susceptible wells. Figure 1 shows all of the locations of water samples tested in Tiers 1-3 including surface waters (blue squares) and wells by susceptibility category (circles).

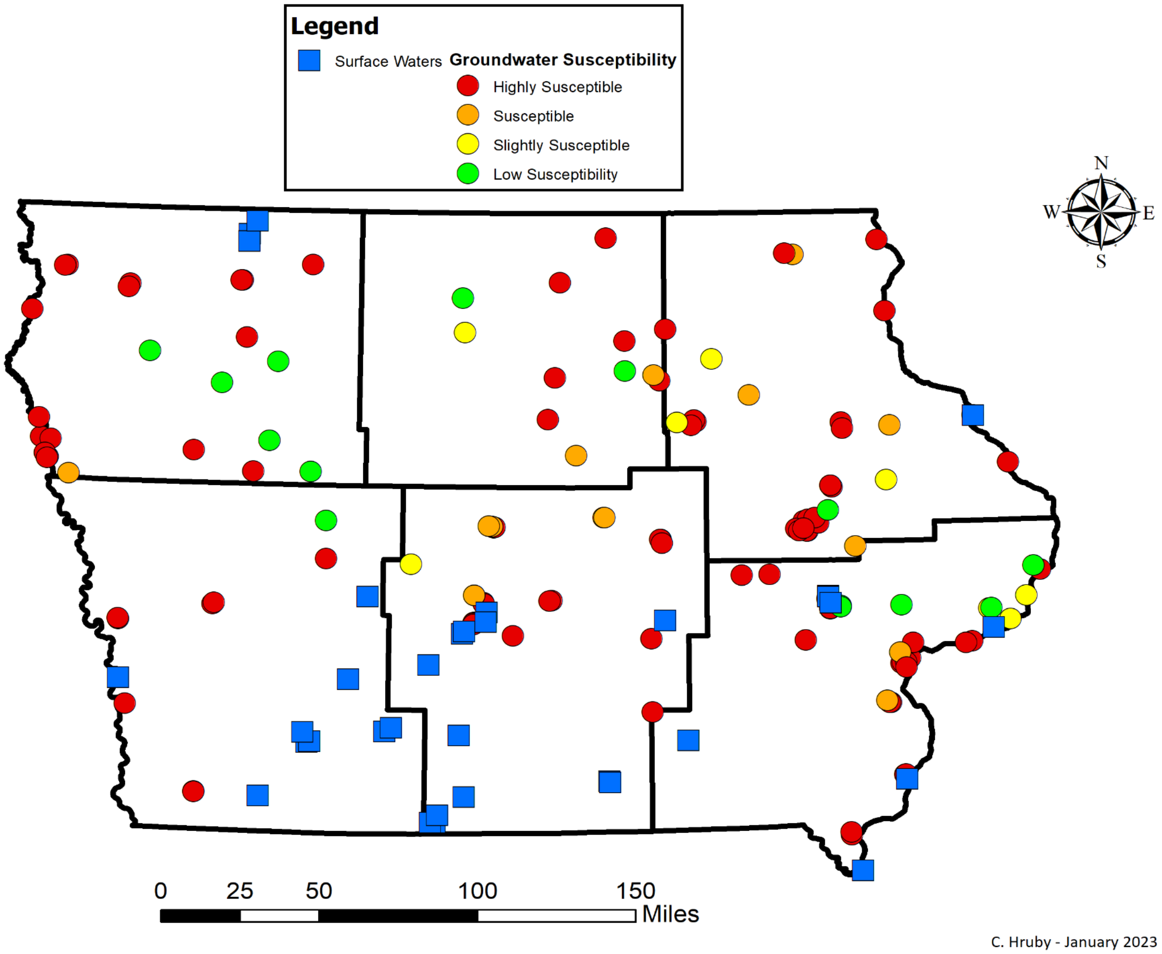

Figure 1. Surface water and groundwater locations sampled in Tiers 1, 2, and 3.

The majority of wells sampled draw water from alluvial aquifers (sands and gravels) adjacent to rivers, but others draw water from buried sand and gravel deposits or bedrock aquifer systems. A list of sampling locations and associated parameters can be found in Appendix A1 (surface water intakes) and A2 (wells).

Sampling and Analyses

The first phase of sampling began with Tier 1 and 2 locations in October 2021 and was completed in February 2022. Tier 3 sampling began in June 2022 and was completed in December 2022. All samples were collected by DNR personnel following the standard operating procedure (SOP) outlined on the PFAS Action Plan website. For quality control, field blanks were collected using certified PFAS-free water at each finished drinking water location to ensure field collection procedures were not contaminating samples. One duplicate sample of the finished water was also collected at each water supply. Samples were immediately placed on ice and shipped the same day or following morning to Eurofins Laboratory in Indiana for Tiers 1 and 2, and the State Hygienic Laboratory in Coralville, Iowa, for Tier 3.

All raw, finished, and duplicate samples were run according to EPA method 533 for 25 unique PFAS compounds as listed in Table 1. Field reagent blank samples were analyzed if any PFAS compounds were detected in the other samples.

Results were emailed to the DNR generally within 4 weeks and communicated to the water supply prior to being uploaded to the Safe Drinking Water Information System (SDWIS) database and shared via the DNR’s interactive PFAS map.

Table 1. Unique PFAS Compounds included in DNR Testing

Analyte	Abbreviation	CASRN
Perfluorobutanoic acid*	PFBA	375-22-4
Perfluorobutanesulfonic acid*	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoro (2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7
Perfluoroheptanoic acid*	PFHpA	375-85-9
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorohexanoic acid*	PFHxA	307-24-4
Perfluorohexanesulfonic acid*	PFHxS	355-46-4
Perfluoro-4-methoxybutanoic acid*	PFMBA	863090-89-5
Perfluoro-3-methoxypropanoic acid*	PFMPA	377-73-1
Perfluorononanois acid	PFNA	375-95-1
Perfluorooctanoic acid*	PFOA	335-67-1
Perfluorooctanesulfonic acid*	PFOS	1763-23-1
Perfluoropentanoic acid*	PFPeA	2706-90-3
Perfluoropentanesulfonic acid*	PFPeS	2706-91-4
Perfluoroundecanoic acid	PFUnA	2058-94-8
11-Chloreicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
1H, 1H, 2H, 2H-Perfluorohexane sulfonic acid	4:2 FTS	757124-72-4
1H, 1H, 2H, 2H-Perfluorooctane sulfonic acid	6:2 FTS	27619-97-2
1H, 1H, 2H, 2H-Perfluorodecane sulfonic acid	8:2 FTS	39108-34-4
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4, 8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Hexafluoropropylene oxide dimer acid*	HFPO-DA	13252-13-6
Nonafluoro-3, 6-dioxaheptanoic acid	NFDHA	151772-58-6

*Indicates analytes that were detected in at least one sample

Results

Quality Control

PFAS are analyzed at the part per trillion (equivalent to ng/L) level. Given the sensitivity of these tests, and the fact that PFAS may be present in everyday items, it was important to evaluate the quality of the data reported for Tiers 1-3. Quality control protocols included collection of field blanks and duplicates of finished water samples at source entry points. EPA Method 533 also requires analysis of isotopically tagged PFAS standards in the lab. The results of these procedures indicate that both sampling and laboratory protocols were done correctly and the reported concentrations can be viewed with confidence.

None of the blank samples (52 in Tiers 1 and 2, and 50 in Tier 3) that were analyzed contained any detectable levels of PFAS. This means that sampling personnel were able to avoid introducing any PFAS into the samples and that laboratory procedures also prevented cross-contamination. For Tiers 1 and 2, 70 duplicate samples were analyzed by Eurofins Laboratory in Indiana. For these samples, where PFAS were detected in finished waters, duplicate sample results averaged 2.3% different than primary samples, and only one result exceeded 10% difference (12.5% for PFBA). For Tiers 1 and 2, all isotope dilution results were within acceptable ranges according to EPA Method 533. For Tier 3, 54 duplicate samples were analyzed by the State Hygienic Laboratory in Coralville, Iowa. The average percent difference between reported PFAS concentrations in primary samples and duplicates was 3%, and only three duplicate results were between 10-16% different (all for PFBA). All isotope dilution results were within acceptable ranges in the Tier 3 data, except for one sample, where isotope dilutions exceeded the acceptable range for four PFAS compounds (PFNA, PFDA, PFUNA, and PFDoA), and thus, those results were excluded.

Finished Water Results

DNR staff collected 126 unique finished water samples during Tiers 1, 2, and 3. These samples represented 116 public water supplies, including 99 community water supplies, 16 non-transient non-community, and 1 transient non-community water supply. At least one PFAS compound was detected in 52 (41%) of the finished water samples, but only 15 of the finished water samples (12%) had reported concentrations above the revised HAs (Figure 2).

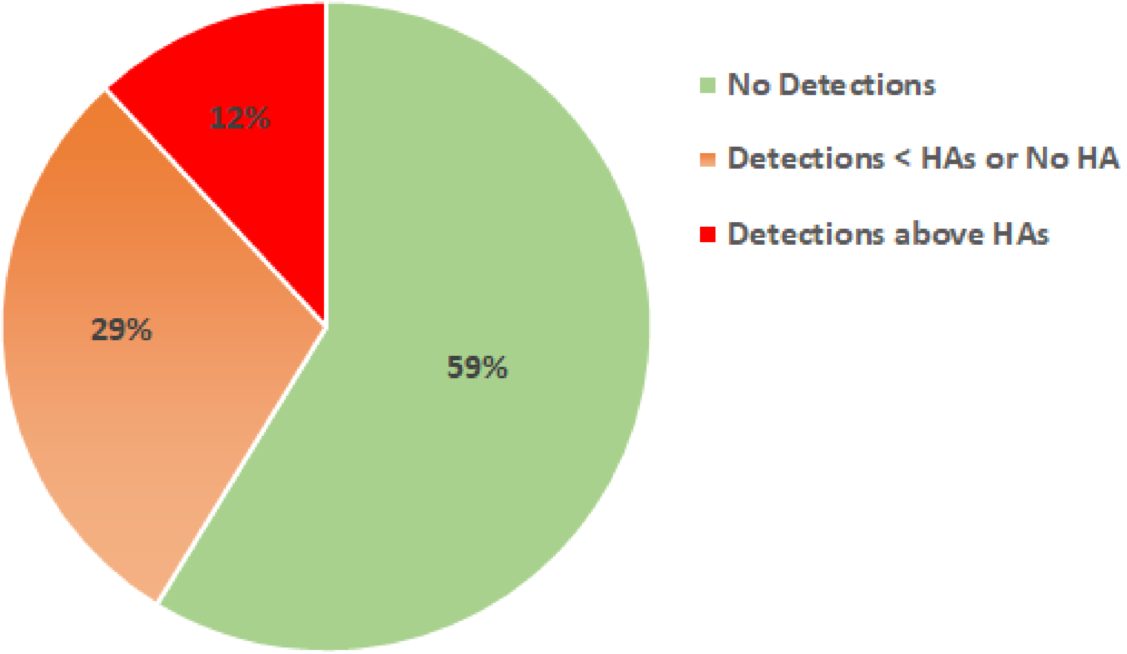

Figure 2. Summary of PFAS Detections in Finished Water Samples Relative to the Revised HAs.

Although some PFAS compounds were found in several finished water supplies, the reported concentrations have generally been low. A summary of results for individual PFAS compounds in finished water is shown in Table 2.

Of the 3,146 individual PFAS measurements reported for finished water, only 132 had detectable concentrations (4%), and only 26 (<1%) had reported concentrations above 10 ng/L (or ppt).

PFBA was the most frequently detected (37%) PFAS compound, and PFBA also had the highest reported concentration in finished water (340 ng/L). The graph below shows the range of concentrations of each of the 12 PFAS compounds detected in finished water (Figure 3). Median values for all PFAS compounds are below the laboratory reporting limits.

Table 2. Summary of results for each individual PFAS compound in finished water samples.

	PFAS Abbreviation	Number of Samples	Number of Detections	Detection Frequency (%)	Max Concentration (ng/L)	2022 Revised HA (ng/L)	Percent Exceed HA (%)
Carboxylic Acids	PFBA	126	46	37	340	-	-
	PFPEeA	126	16	13	25	-	-
	PFHxA	126	11	9	39	-	-
	PFHpA	126	3	2	5.1	-	-
	PFOA	126	13	10	18	0.004	10
	PFNA	125	0	0	ND	-	
	PFDA	125	0	0	ND	-	
	PFUnA	125	0	0	ND	-	
	PFDoA	125	0	0	ND	-	
	ADONA	126	0	0	ND	-	
	NFDHA	126	0	0	ND	-	
	PFEESA	126	0	0	ND	-	
	PFMBA	126	1	1	4.6	-	
	PFMPA	126	1	1	14	-	
	HFPO-DA	126	1	1	2.5	10	0
Sulfonic Acids	PFBS	126	14	11	32	2000	0
	PFPeS	126	2	2	15	-	
	PFHxS	126	10	8	43	-	
	PFHpS	126	0	0	ND	-	
	PFOS	126	14	11	59	0.02	11
	4:2 FTS	126	0	0	ND	-	
	6:2 FTS	126	0	0	ND	-	
	8:2 FTS	126	0	0	ND	-	
	9Cl-PF3ONS	126	0	0	ND	-	
	11Cl-PF3OUdS	126	0	0	ND	-	

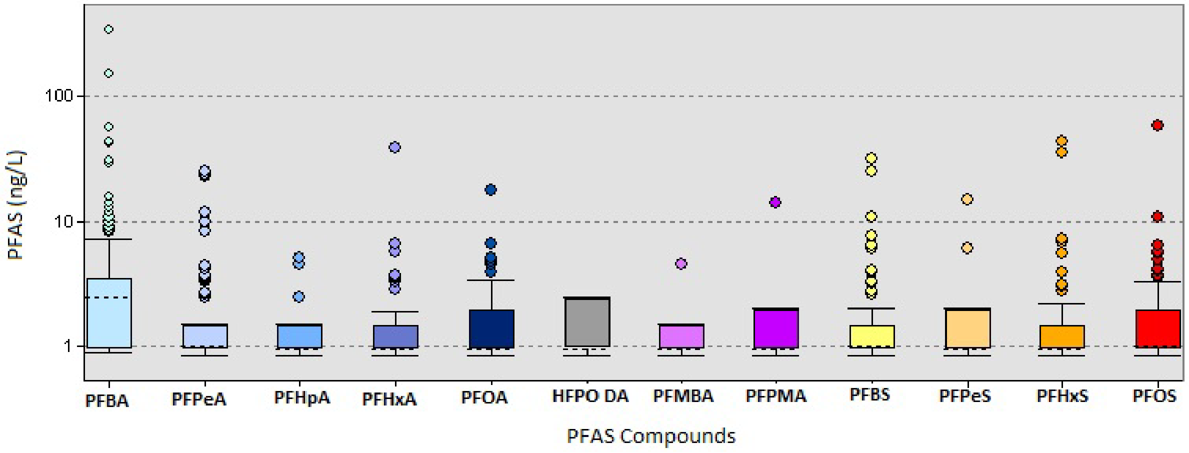

Figure 3. Box plots showing ranges of reported concentrations of PFAS compounds detected in finished water samples. For the purposes of this graphic all non-detects were assigned a value of half the minimum reporting limit. The boxes represent the 25th-75th percentile of results. Outliers are represented by dots.

Although raw and finished water samples were conducted for each water supply location, this monitoring effort was not designed to compare the effectiveness of treatment at each facility. Many water supplies combine water from several sources before treatment, and not all sources of water were tested at each location.

Interactive Map

To date, PFAS levels above the current HA have been detected near industrial areas, locations of fires or fire-training activities, and along the Mississippi. In June 2022, after the HAs were revised and new HAs were added by the EPA, the legend and color scheme for the Interactive PFAS Map were updated. Figure 4 is a screenshot of the interactive map from January, 2023. Water supplies that have had detections of any of the PFAS compounds with HAs have begun conducting required quarterly monitoring. As contaminated wells are taken offline, treated, or blended, the locations where finished waters are shown to contain PFAS have changed. Results of all testing of raw and finished waters are available by clicking on the location of interest.

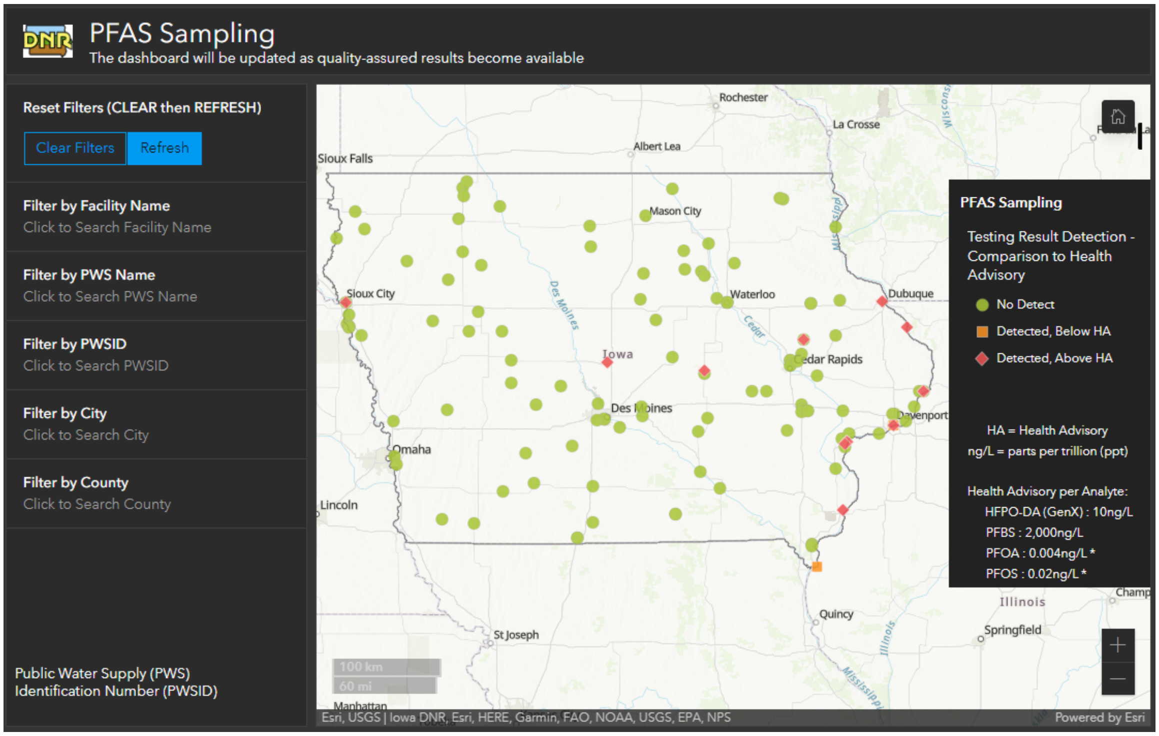

Figure 4. Screenshot of the Interactive PFAS Map from January, 2023.

Raw Source Water Results

Surface Water

Twenty-three public water supplies in Iowa rely on direct withdrawal of surface waters for some or all of their source water, and several communities purchase water from these supplies. Water samples were collected from all 23 of these supplies at 33 unique locations representing surface water from lakes (22 samples) and rivers (12 samples) across the state. Where possible, samples were collected from within the water plant through an intake, while in some cases, water was sampled directly from the shoreline of the water body to avoid any chemical additives. Of the 25 PFAS compounds analyzed, only six were detected in surface water samples: PFBA, PFPeA, PFOS, PFOA, PFHxA, and PFBS. Figure 5 shows the frequency of detection of these six PFAS compounds in surface water samples.

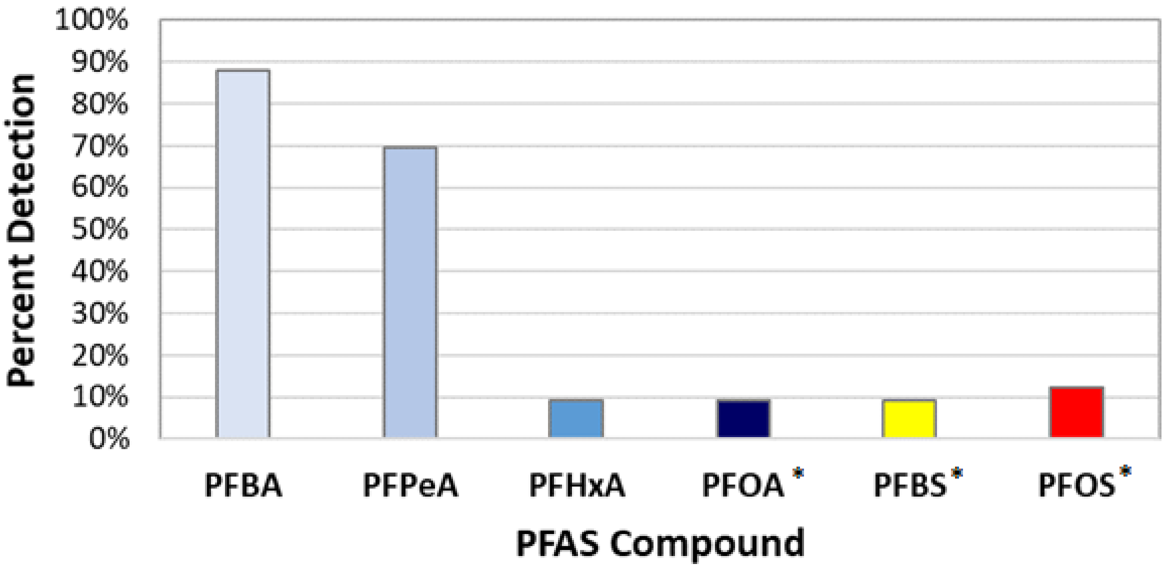

Figure 5. Frequency of PFAS detections in surface water samples for individual PFAS compounds. Compounds with an asterisk* have HA levels set by EPA. Compounds not shown were not detected.

PFBA was the most commonly detected compound in surface water samples, present in 29 (88%) of samples. All but 3 of these samples had reported concentrations of PFBA below 7 ppt. Higher concentrations of PFBA (29-32 ppt) were reported in the three samples from the Mississippi River at Burlington, Davenport, and Keokuk. PFPeA was the second most abundant compound, detected in 23 (70%) of surface water samples at a maximum concentration of 4.9 ppt. PFOS was detected in four samples (12%) at a maximum concentration of 3.8 ppt, and PFOA was detected in 3 samples (9%) at a maximum concentration of 2.9 ppt. PFHxA and PFBS were each detected in 3 samples (9%) at maximum concentrations of 4.0 and 8.0 ppt, respectively.

The map in Figure 6 below shows the relative proportions of each PFAS compound within the surface water samples, and the approximate location of those samples. Most surface water samples contained a mixture of low levels of PFBA and PFPeA, which are short-chain carboxylic acid PFAS that are considered more mobile than other PFAS compounds and can be transported through the atmosphere and deposited in precipitation. Detections of PFOA in surface waters were isolated to the samples from the Mississippi River, and PFOS was found in the Mississippi River samples and in a small pond used occasionally by Iowa City.

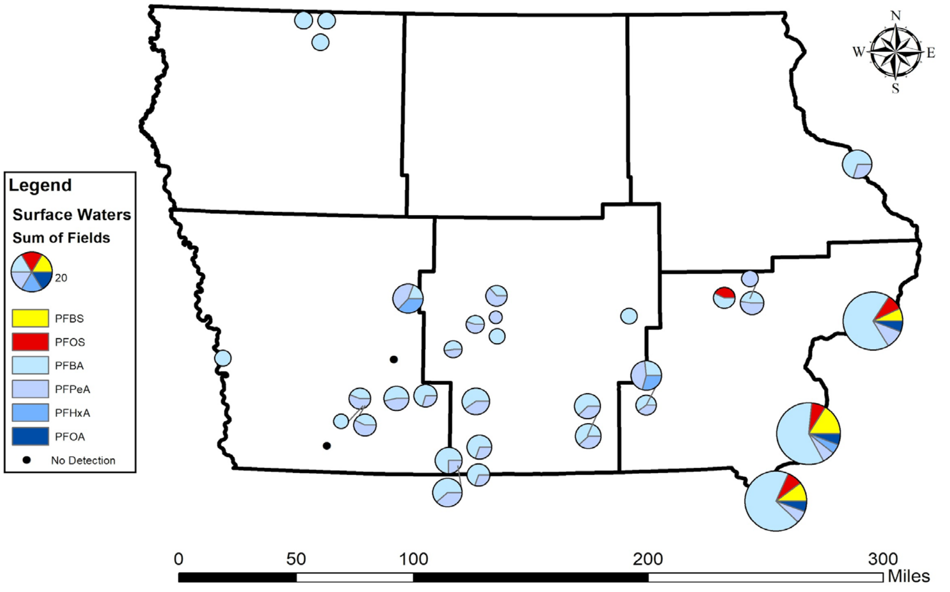

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Figure 6. Map of PFAS Compounds Detected in Surface Water Samples

Groundwater

Raw (untreated) groundwater samples were collected from 128 unique wells representing 100 public water supplies, 17 non-transient non-community public water supplies, and one transient non-community public water supply. Fourteen individual PFAS compounds (Figure 7) were detected at least once in groundwater samples. Forty-one (32%) of the samples had detections of at least 1 (up to 11) PFAS compound. As with finished water and surface water, PFBA was the most frequently detected PFAS compound in groundwater. PFBA was detected in 31 samples (24%), and of those, it was the only PFAS compound detected in 9 samples. PFBA was also the compound with the highest reported concentration of 340 ppt. Figure 7 summarizes the frequency of detection of each individual PFAS compound and Table 3 summarizes frequency of detection along with their maximum reported concentration.

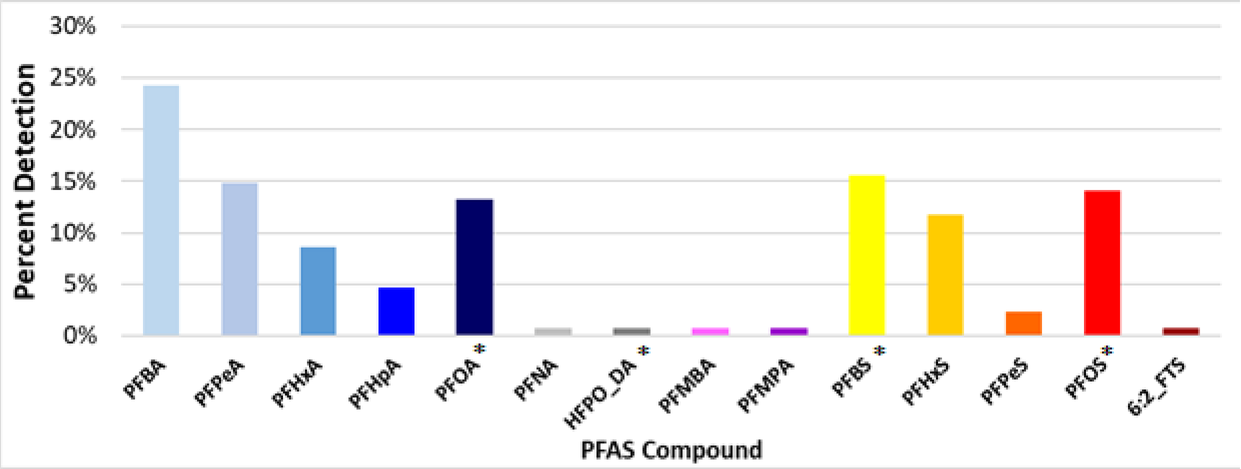

Figure 7. Frequency of detection of individual PFAS compounds in groundwater samples. Compounds with asterisks* have HA levels set by EPA. Compounds that were not detected are not shown.

Table 3. Summary of results for all PFAS compounds in untreated groundwater samples

PFAS Abbreviation	Number of Results Reported	Number of Detections	Percent Positive Samples (%)	Maximum Concentration (ng/L)
PFBA	128	31	24	340
PFPEeA	128	19	15	70
PFHxA	128	11	9	45
PFHpA	128	6	5	14
PFOA	128	17	13	29
PFNA	128	1	1	4.2
PFDA	128	0	0	ND
PFUnA	128	0	0	ND
PFDoA	128	0	0	ND
HFPO-DA	128	1	1	2.5
PFMBA	128	1	1	4.6
PFMPA	128	1	1	14
PFEESA	128	0	0	ND
ADONA	128	0	0	ND
NFDHA	128	0	0	ND
PFBS	128	20	16	32
PFPeS	128	3	2	16
PFHxS	128	15	12	43

PFAS Abbreviation	Number of Results Reported	Number of Detections	Percent Positive Samples (%)	Maximum Concentration (ng/L)
PFHpS	128	0	0	ND
PFOS	128	18	14	60
9Cl-PF3ONS	128	0	0	ND
11Cl-PF3OUdS	128	0	0	ND
4:2 FTS	128	0	0	ND
6:2 FTS	128	1	1	3.3
8:2 FTS	128	0	0	ND

Pie charts mapped below (Figure 8) show the locations and relative proportions of PFAS compounds in each untreated groundwater sample. In comparison to surface waters, groundwater samples have a larger number of compounds and a larger variety of mixtures in the samples. Similarities in PFAS mixtures are apparent at some locations, while significant differences between nearby wells can also be observed. Black dots are locations where groundwater was sampled, but no PFAS compounds were detected.

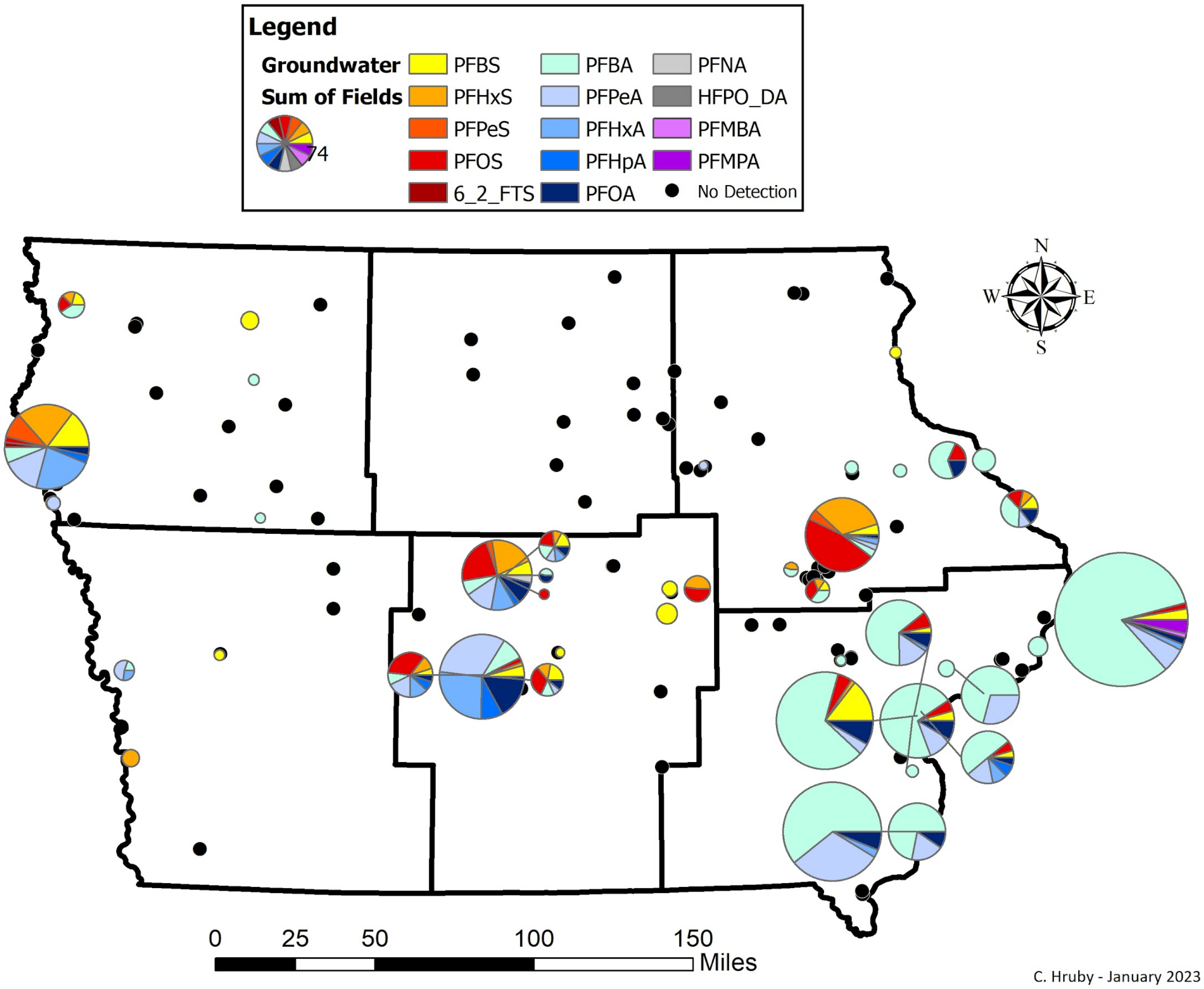

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Figure 8. Location and Relative Concentration of PFAS Compounds in Groundwater Samples

PFAS fingerprinting is a process where the mixtures and relative proportions of different PFAS compounds found in each sample are used to help identify PFAS sources and sometimes give clues to the effects of various transport processes. For example, locations where samples are dominated by sulfonates (PFAS compounds that end in "S" and shown in warm colors) are generally thought to have been impacted by the use of legacy fire-fighting foams. This is consistent with the known use of these chemicals in fire-training or fire-fighting activities in Sioux City, Ames, and Central City. Along the Mississippi, samples of both surface and groundwater are dominated by carboxylic acids (PFAS ending in "A" and shown in cool colors) which are considered more mobile in air and water and are often transported farther from a PFAS source. Future investigations could use this fingerprinting methodology to determine how many PFAS sources may have contributed to contamination in a given area.

Tier 1 contained the subset of Iowa's wells considered most likely to be impacted by PFAS because of geologic conditions (susceptibility) and proximity to potential sources. Tiers 2 and 3 sampled a number of less susceptible wells and locations farther from mapped potential sources of PFAS. The outcome of these sampling efforts support the tiered approach. Table 4 shows the relative percentage of sampling with PFAS detections found during each tier.

Table 4. Summary of PFAS detections in groundwater by sampling tier.

Sampling	PFAS Detected	PFAS Not Detected
Tier 1	70%	30%
Tier 2	31%	69%
Tier 3	20%	80%
Combined Tiers 1-3	32%	67%

The results of Tiers 1-3 also highlight the importance of using susceptibility categories in predicting whether a well has the potential to be contaminated by PFAS. Of the 41 wells that had at least one PFAS detection, 37 were categorized as Highly Susceptible, 3 were considered Susceptible, 1 was ranked as Slightly Susceptible, and none were categorized as Low Susceptibility. As expected, alluvial wells were the most likely to contain some PFAS (29 wells, 70% of detections). However, bedrock wells, including Silurian-Devonian (8 wells, 20%) and Cambrian-Ordovician (2 wells, 5%) were also found to contain PFAS. Two Buried Sand and Gravel wells (5%) also had detections of PFAS. None of the samples from wells drawing water from the Mississippian (4 wells) or Dakota aquifers (4 wells) contained PFAS.

Overall, results from Tiers 1-3 indicate that the more mobile short-chained carboxylic acids, PFBA and PFPeA, commonly occur at low concentrations in surface water samples. Long-chain compounds, PFOS and PFOA, were rarely found in surface waters with the exception of samples from the Mississippi River. PFAS compounds were less frequently detected in groundwater sources, but they were found at higher concentrations than in surface water and in more complex mixtures. Most of the reported concentrations of individual PFAS compounds were below 10 ppt. PFOS and PFOA concentrations in finished drinking waters did not exceed the former health advisory level (70 ppt combined), but since the HAs were revised in June 2022 by EPA, six systems have had finished water samples that exceed the HAs.

Water Supply Protocol

DNR issues water supply system operation permits to community public water supplies; non-transient non-community public water supplies; and transient non-community public water supplies. Each permit contains monitoring requirements and schedules specific to the water supply. A new protocol was developed to include monitoring requirements based on PFAS sampling results. The criteria for revision was based upon a detect of a PFAS chemical with a HA in either the raw or finished water.

A total of twenty operations permits have been revised to include monitoring as a result of sampling Tiers 1, 2, and 3. A listing of these water supplies can be found in Table 5. Monitoring for PFAS was assigned quarterly for one year at the finished water location for which any of the four PFAS with HAs were detected. An evaluation of results will be conducted following the year of sampling to determine future monitoring requirements.

Table 5. Communities with Revised Operating Permits and New Monitoring Requirements

PWSID	Name
IA8503039	Ames Water Treatment Plant
IA7048161	Bayer Crop Science LP
IA8218050	Buffalo Water Supply
IA2909053	Burlington Municipal Waterworks
IA2322066	Camanche Water Supply
IA5715093	Cedar Rapids Water Department
IA5009056	Colfax Water Supply
IA3126052	Dubuque Water Works
IA8335029	Harlan Municipal Utilities
IA5225079	Iowa City Water Department
IA8222001	Iowa-American Water Co- Davenport
IA7000686	Kammerer Mobile Home Park
IA5640019	Keokuk Municipal Water Works
IA2258012	McGregor Water Dept
IA7048001	Muscatine Power & Water
IA8482096	Rock Valley Water Supply
IA9778054	Sioux City Water Supply
IA2171071	Spencer Municipal Water Utility
IA8670013	Tama Water Supply
IA7785007	West Des Moines Water Works

Contaminated Sites Section Protocol and Follow-up Sampling

In 2020, DNR's Contaminated Sites Section developed a response protocol setting action steps based on monitoring results. A screening level of 40 ppt for PFOS and PFOA was originally set based on Department of Defense (DOD) guidance, but is being reevaluated as regulatory guidance evolves. Any raw water locations above the screening level qualify for additional review in the form of a Phase-1 type report. DNR also plans to complete a Phase 1 at any location where quarterly sampling performed by the municipality shows an increasing trend for PFAS with HAs. If a Phase 1 review reveals a clear PFAS source and a threat to the public health remains, DNR will consider field sampling of soil and groundwater in order to determine that other water sources in the vicinity are not impacted and/or demonstrate a complete pathway. If a potentially responsible party is evident and solvent, this work may be required of them under IAC 567-133.

Only one site, Central City well #2, reached the 40 ppt threshold, and has undergone a Phase 1 review. This review is a table-top exercise that includes synthesis of hydrogeological data, geological information, evaluation of potential sources of PFAS, historical review of potential spills (derailments, fires, etc.), and assessment of nearby land uses.

Follow up sampling at Central City showed that their second well (not included in the prior sampling event) had no detectable levels of PFAS. Therefore, the city has decided to rely solely on the PFAS-free well (Well #4) for the near future. If the water available from this well is insufficient for peak water uses, an additional well may be drilled.

Future Sampling of Drinking Water Sources

DNR will continue sampling for PFAS in raw and treated water at public water supplies over the next few years. In addition, the EPA is requiring testing of some finished water supplies as part of the Unregulated Contaminant Monitoring Rule #5 (UCMR5). These samples will be collected between 2023-2025. UCMR5 monitoring includes all communities in Iowa serving populations of 3,300 or more and eighteen smaller communities. Private wells are now eligible for PFAS testing through the Grants-to-Counties Program as long as requests for funding are submitted by the county sanitarians and approved by the Iowa Department of Health and Human Services. Samples of private wells must be collected by trained staff and analyzed by laboratories that are certified in Iowa for PFAS in drinking water. Vulnerable private wells in areas of known contamination will be prioritized. EPA has indicated that they will be setting maximum contaminant levels for PFAS within the next year. Once that occurs, all public water supplies in Iowa will be required to sample finished water for PFAS.