13 Stakeholder Perspectives

This section identifies the concerns of stakeholders who have been or may be affected by PFAS contamination. In this section, we summarize many of the concerns that have been expressed by local communities, tribes, and environmental groups. Evaluation of exposure levels and potential human health consequences are of paramount concern to stakeholders.

Section Number	Topic
13.1	Stakeholder Concerns
13.2	Specific Tribal Stakeholder Concerns
13.3	Stakeholder Resources

The term “stakeholder” is defined broadly by ITRC as members of environmental organizations, community advocacy groups, tribal entities or other citizens’ groups that deal with environmental issues, or a concerned citizen who is not a member of any organization or group. Public stakeholders, such as advocacy groups, often speak for the communities that are affected by environmental issues. In this document, a differentiation is made between public stakeholders and interested parties (responsible parties, state regulators, and owners and operators of contaminated sites).

Stakeholders share greater ownership of outcomes when they can influence site characterization, remedy selection, and long-term site management. Because PFAS compounds are so abundant in consumer products, stakeholders are also concerned with the production and eventual use of these products and are seeking safer alternatives and sometimes outright bans. Environmental regulators and responsible parties also benefit from informed, constructive stakeholder involvement because it can help them make better decisions, reduce the likelihood of costly, time-consuming repeated work, and allow those in affected communities to have a voice in governing the long-term use of land, water, and other resources. Often, stakeholders such as long-time residents have unique site knowledge as well as a major stake in the remedial outcome.

Developing site-specific characterization and remediation strategies for communities and tribal organizations can be controversial, because there are many misconceptions about PFAS. The lack of scientific knowledge about many of these PFAS compounds will be an impediment for educating the public. Therefore, early and effective community engagement emphasizing timely access to test data, transparency, and responsiveness is imperative. Community engagement may be able to address many stakeholder concerns and help to communicate risks. The ITRC Risk Communication Toolkit for Environmental Issues and Concerns includes information about stakeholder engagement and is published as a separate document.

This section identifies the concerns of stakeholders who have been or may be affected by PFAS contamination. Because it is an emerging contaminant and has been detected in ecological receptors (animals and plants) and blood serum in many humans, there are many individuals who are potentially affected worldwide.

In this section, we summarize many of the concerns that have been expressed by local communities, tribes, and environmental groups. Evaluation of exposure levels and potential human health consequences are of paramount concern to stakeholders. The list of concerns below is not all inclusive, as developments in science and identification of contaminants in the environment are likely to lead to additional concerns. This list was developed from general research on PFAS, direct communication and involvement with environmental and community groups, a consultant for one of the tribes, and extensive review of news reports. It is intended to highlight the concerns that have been expressed by various groups. It is not intended to be a definitive statement of the technical merits of those concerns.

The following is a list of the concerns that have been identified. Detail of these concerns follows.

- Lack of advisories for thousands of PFAS compounds
- Desire for one standard or screening level for PFAS compounds

- Lack of advisory standards or screening levels for PFAS in environmental media other than drinking water
- Lack of sdvisory standars for human consumption of food
- Lack of occupational standards
- Lack of ecological risk guidelines
- Lack of comprehensive monitoring information
- Precautionary approach
- Safety of short-chain substitutes
- AFFF release sites and Unused AFFF Disposal
- Duty to warn AFFF responders
- Limitations in sampling and analysis methods
- Limited programs for health monitoring and blood testing
- PFAS in food packaging
- Potential PFAS contamination in recycling and compost
- Lack of disclosure by product manufacturers
- Lack of disclosure of information on the health effects of PFAS
- Responsibility for sampling and treatment on private property
- Lack of scientific evidence that current PFAS cleanup methods and remedies are fully protective of human and ecological health and prevent toxic emissions
- Stormwater discharges that may contain PFAS
- Psychological effects
- Economic consequences of local PFAS contamination

Stakeholders who use this document should consider that much of the information is very technical. Nevertheless, it aims to lay a framework by which to understand this set of compounds, the foundational nature of the science, and many of the uncertainties.

13.1 Stakeholder Concerns

13.1.1 Lack of Advisories for Thousands of PFAS Compounds

As of September 2019, USEPA has set health advisories for only two of the over 4,000 PFAS compounds: PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonate). The lifetime health advisory has been set at 70 nanograms per liter (ng/L or parts per trillion) for the combined concentrations of PFOA and PFOS in drinking water. The health consequences of many PFAS compounds remain uncertain. Firm conclusions relating individual PFAS compounds to specific health outcomes remain elusive (Guelfo et al. 2018).

13.1.2 Desire for One Standard or Screening Level for PFAS Compounds

Many stakeholders believe that PFAS should be treated as a class of chemicals, similar to how PCBs or dioxin are currently regulated. Given the lack of toxicological information for the vast majority of PFAS, when even less is known about the potential additive and synergistic effects associated with PFAS mixtures, many stakeholders support testing for total PFAS as the preferred screening method, rather than limited compound-specific testing using target analyte lists (CSWAB 2018). For example, the Conservation Law Foundation in New England put forth a petition requesting that PFAS in drinking water be regulated as a group with a treatment technique drinking water standard. See https://www.nhpr.org/post/activists-ask-new-england-states-regulate-pfas-chemicals-class#stream/0 and https://www.mass.gov/lists/pfas-information-a-petition-for-rulemaking-to-establish-a-treatment-technique-drinking-water. However, many PFAS, like certain fluoropolymers, need significantly less toxicological information because of their inability to enter cells to cause adverse effects (Henry et al. 2018).

13.1.3 Lack of Advisory Standards or Screening Levels for PFAS in Environmental Media other than Drinking Water

With the exception of regional soil screening levels for PFOS, PFOA, and PFBS, there are no federal standards or screening levels for monitoring environmental media (air, soil, and surface water and groundwater not used for drinking), and no federal requirements that compel such monitoring. USEPA is planning to develop interim recommendations regarding groundwater for PFOS and PFOA. USEPA is planning to develop interim cleanup recommendations to address groundwater contaminated with PFOA and PFOS. Section 8 includes information about regulations, guidance, and advisories for PFAS. There are few limits by the federal and most state governments on PFAS in biosolids being applied to land for food and/or

nonfood crops, nor on concentrations in surface water that may affect fish and consumers of fish. PFAS, including PFOA and PFOS, have been detected in biosolids produced at a wastewater treatment plant (WWTP), and in soil, surface waters, and leachate from landfills. WWTP sludge is commonly applied to land as a soil amendment. Botanical uptake by crops such as corn, hay, and soybeans is suspected. Section 5.6 and Section 6.5.1 discuss plant uptake of PFAS. In addition, PFAS in surface water also creates an exposure pathway that potentially affects ecological and human health.

13.1.4 Lack of Advisory Standards for Human Consumption of Food

Some states have issued new fish consumption advisories for lakes and rivers after tests confirmed the presence of PFAS in surface water. Section 15.3 includes a case study example about a recently enacted fish consumption advisory by the New Jersey Department of Environmental Protection.

In February 2018, the Environmental Protection Authority of Victoria, Australia, "assessed waterfowl from three wetlands to better understand the extent and distribution of PFAS contamination ahead of the duck hunting season. PFAS was detected in waterfowl from all three wetlands." "In May and June 2018, the agency conducted a more extensive study into PFAS concentrations in waterfowl from 19 wetlands around the state …Waterfowl tissue samples were found to contain variable PFAS concentrations. Perfluorooctane sulfonate (PFOS) and perfluorohexane sulphonic acid (PFHxS) concentrations in waterfowl from nine wetlands exceeded Food Standards Australia and New Zealand (FSANZ) trigger points for investigation. As a result, health risk assessments were undertaken on the samples that exceeded FSANZ trigger points for investigation, and health advisories were issued" (Environmental Protection Authority Victoria 2019)p.1.

In addition, PFOS is accumulating in the Arctic. The Alaska Community Action on Toxics (ACAT) reported that "A study on the presence of PFOS in the livers of arctic animals revealed elevated PFOS levels in almost all species studied." Furthermore, it reported that "In a recent study of foods consumed by a Canadian Inuit population, traditional foods were more widely contaminated and contained higher concentrations of PFCs [PFAS] than nontraditional foods. Caribou had the highest concentrations of perfluorinated compounds (PFCs), including PFOS." (A Report for the Delegates of the 4th Conference of the Parties Stockholm Convention on Persistent Organic Pollutants, see https://www.akaction.org/wp-content/uploads/2013/03/POPs_in_the_Arctic_ACAT_May_2009.pdf). At the request of the Yupik people of St. Lawrence Island, the ACAT is conducting a study to determine the safety of the traditional foods they eat for subsistence.

13.1.5 Lack of Occupational Standards

Workplace exposures seems to be poorly studied and there are no standards for occupational exposure for PFAS. Workers at paper mills and wastewater treatment plants where PFAS have been documented in indoor air, as well as developers and industrial users of PFAS, do not have specific occupational standards.

13.1.6 Lack of Ecological Risk Guidelines

There is wide concern that ecological receptors have been or will be harmed by releases of PFAS to the environment (Section 7.2). Currently, there are no federal risk-based ecological guidelines or thresholds for environmental media. Ecotoxicity studies are generally limited to a relatively small number of PFAS compounds (typically PFOA and PFOS). It is important to expand studies in this field to evaluate additional PFAS, including short-chain precursor compounds as well as "next-generation" substitute compounds. Several states have established some criteria that are intended to protect aquatic organisms in their respective surface waters. Section 8.2.3 includes more information about state regulation of PFAS. In addition, the ITRC also maintains updated tables of PFAS water values, and PFAS soil values from state, federal, and some international countries posted as an Excel file https://pfas-1.itrcweb.org/fact-sheets/.

13.1.7 Lack of Comprehensive Monitoring Information

Many stakeholders are concerned that most individuals and communities do not have any testing for PFAS. America's Water Infrastructure Act of 2018 requires drinking water systems serving more than 3,300 people to test for unregulated contaminants pursuant to USEPA's Unregulated Contaminants Monitoring Rule (UCMR). However, sampling for UCMR4 (USEPA 2016f), which occurred between 2018-2020 did not include any PFAS compounds in its analyte list. Many stakeholders are concerned that an opportunity to better understand the magnitude of PFAS contamination on public water systems (PWSs) will not be taken. Prior to this new law, only drinking water systems that served more than 10,000 people were required to monitor for unregulated contaminants. Contaminants covered by the UCMR include PFOA, PFOS, 1,2,3-TCP, hexavalent chromium, and 1,4-dioxane. Additionally, smaller PWSs and private wells were not included in the third round of USEPA's required monitoring (Unregulated Contaminant Monitoring Rule, UCMR3). The new testing requirement, which goes

into effect in 2021, is expected to add more than 5,000 drinking water systems to the list of systems that are required to test for these unregulated contaminants. However, the UCMR4 does not cover PFAS (https://environblog.jenner.com/corporate_environmental_l/2018/10/new-law-requires-widespread-testing-for-unregulated-contaminants.html). UCMR5 is going to test for some PFAS chemicals.

More information about the UCMR3 data is included in Section 8.2.2.2. It is estimated that approximately six million residents of the United States have drinking water that exceeds the health advisory for PFOA or PFOS, or both (APHA 2016). Moreover, there is no ongoing federal requirement for PFAS testing of any drinking water systems or private wells. Some states (for example, New Hampshire) have initiated testing of private wells in certain locations where there is a high potential for PFAS contamination. The Washington State Department of Health recently announced that it will be conducting additional testing for PFAS at several hundred untested water systems. The state of Michigan is also testing all public community water systems for PFAS (see https://www.michigan.gov/pfasresponse/0,9038,7-365-88059—,00.html).

13.1.8 Precautionary Approach

Given the lack of toxicological data for the great majority of PFAS compounds and mixtures, many stakeholders want a precautionary approach to the use, treatment, and analysis of PFAS-containing chemicals. This precautionary approach presumes compounds of similar structure may be expected to have similar modes of action and pose a similar risk to human health and the environment, lacking evidence to the contrary.

13.1.9 Safety of Short-chain Substitutes

Many stakeholders are concerned with the use of substitute short-chain PFAS. After concerns arose that PFOA and PFOS (both long-chain PFAS) have health risks at very low concentrations, industry began to develop and substitute them with shorter chain PFAS. Although some short-chain PFAS appear to be less bioaccumulative, the publicly available data are limited. Short-chain PFAS are persistent, degrade into extremely persistent forms, and tend to be more water soluble and more mobile than long-chain PFAS. Because of their greater water solubility, studies indicate short-chain substitutes are more readily taken up by plants than longer chain PFAS, including food crops (Higgins 2017). In their Interim Chemical Action Plan for PFAS, the Washington State Department of Ecology and Washington State Department of Health (2019 p. 1) states that short-chain PFAS are difficult to remove from water, noting further “Without additional health and safety data, it is impossible for us to evaluate whether short-chain replacments are safe substitutes. If environmental exposures to short-chain PFAS are found to pose health risks to people or the environment, mitigation will be difficult and expensive.” Finally, in the Helsingør Statement (Scheringer et al. 2014) and the Madrid Statement on Poly- and Perfluoroalkyl Substances (Blum et al. 2015), scientists and other professionals expressed concerns about the embrace of short-chain PFASs as preferable replacements for long-chain PFAS.

13.1.10 AFFF Release Sites

Many stakeholders believe that all potential AFFF release sites should be investigated, and where necessary, potential exposure should be mitigated. Investigations to date have identified the use of AFFF as one of the main sources of PFAS releases to the environment, and AFFF releases have been responsible for PFAS contamination of multiple drinking water sources. Although AFFF foams typically contain less than 2% total PFAS, thousands of gallons of foam mixture may be applied during a given event, and the concentrations of concern for PFAS are very low (below 100 parts per trillion (ppt)). Typical locations where AFFF is stored and used include civilian airports, military bases, chemical plants, municipal fire departments, oil refineries, bulk fuel storage facilities and terminals, and crash sites. AFFF was used abundantly for training purposes at military bases with flight operations and at civilian airports. Additional information is presented in the ITRC AFFF fact sheet (ITRC 2018a) and in Section 3.

13.1.11 AFFF Disposal

Stakeholders are concerned that the disposal method (incineration) for unused AFFF is not regulated and that there may be dangerous byproducts. The military is planning to collect and destroy unused firefighting foam that contains PFOS and PFOA (USDOD 2018a). More than 3 million gallons of the foam and related waste have been retrieved by the military. In a 2017 request for AFFF disposal research project proposals (U.S. Air Force 2017), the Air Force acknowledged that the foam, which was designed to resist extremely high temperatures, is difficult to burn and that “the high-temperature chemistry of PFOS and PFOA has not been characterized, so there is no precedent to predict products of pyrolysis or combustion, temperatures at which these will occur, or the extent of destruction that will be realized.” With unregulated chemicals, there are no protocols that require incineration to reach certain temperatures. (See https://theintercept.com/2019/01/27/toxic-firefighting-foam-pfas-pfoa/)

13.1.12 Duty to Warn AFFF First Responders

Aside from standard workplace safety requirements regarding hazardous materials right-to-know, there has been no legal duty to warn or to require notice of hazards to first responders who handle AFFF. Several studies have concluded that some PFAS were elevated in blood of first responders. The New Hampshire Department of Health and Human Services PFC Blood Testing Program (NH DHHS 2016) results indicate the geometric mean levels of PFOS and PFHxS in firefighters were elevated versus the geometric mean levels of those who had not worked as firefighters. Numerous other studies indicated that blood serum levels were elevated in firefighters (LeMasters et al. 2006; Jim ey al. 2006; (Dobraca et al. 2015). It is difficult to tease out whether these higher levels are related to exposures to AFFF, PFAS in firefighter gear (clothing), or consumption of water from PFAS-contaminated drinking-water wells in affected communities, especially those that may be located near training facilities that have used AFFF.

13.1.13 Limitations in Sampling and Analysis Methods

Stakeholders are concerned that current PFAS site investigations may not adequately define the types and total mass of PFAS present, due to limitations in analytical methods (see Section 11) that are still evolving. Moreover, the PFAS family of compounds contains thousands of chemicals, but standard analytical methods can identify only a few dozen.

A related concern is that the new specification for shorter chain AFFF published by the Department of Defense (USDOD 2018b; NAVSEA 2017) still allows concentrations of PFOA and PFOS up to 800 ppb in AFFF concentrate, because that is the lowest concentration of either PFOA or PFOS that can be measured in the concentrate with current analytical methods. This is because the overall high concentrations of the many chemicals in the AFFF concentrate “swamp” the lab instrument, interfering with its ability to detect any individual compound except when it is present at high concentrations. The new, short-chain AFFF formulations are fluorotelomer-based, so PFOS (and other PFSAs) should not be present and PFOA may be present only as contamination from the production process (as discussed in Section 3.1), but without analytical methods to prove this users cannot know for certain if the new AFFF products are PFOS- and PFOA-free. The ITRC AFFF fact sheet (ITRC 2018a) includes more information about AFFF specifications.

13.1.14 Limited Programs for Health Monitoring and Blood Testing

Some PFAS (for example, PFOA, PFOS) bind to proteins in the blood, making blood testing a means of investigating human exposure to PFAS. Many communities where PFAS has been detected have asked that the government establish a program for blood serum testing and long-term health monitoring so that they can better understand any health risks associated with PFAS exposure. Some states have provided limited testing on people in high-impact areas. For example, New Hampshire provided blood serum testing for people who worked on, lived on, or attended childcare on an AFFF-impacted site and were exposed to contaminated drinking water (NH DHHS 2016). New Hampshire also performed blood tests in selected towns where people used private wells that tested above health advisories for PFOA and PFOS. However, many state and local governments are wary of blood testing programs because there is no correlation between the PFAS level in blood serum and any definitive health effects. People who participate in such tests are usually informed of their results and provided context about how they compare with national and location-specific averages. It does not appear that any long-term program has been established to monitor the health outcomes of exposed populations. If there is no assistance from the government, many community members cannot afford to have their blood tested.

13.1.15 PFAS in Food Packaging

Many stakeholders are concerned that food packaging containing PFAS leaches into food. Food packaging, such as bowls, plates, clamshells, trays, and pizza boxes, often includes PFAS for anti-grease resistance, and PFAS is sometimes used in the molding process to manufacture paper plates and containers. A 2008 FDA study found that “fluorochemical paper additives do migrate to food during actual package use,” and oil and grease “can significantly enhance migration of a fluorochemical from paper” (Begley et al. 2008).

There is only limited peer-reviewed information regarding PFAS transfer to food. One study documented that 6:2 FTOH moves from dishware or containers into food (Yuan et al. 2016). A Canadian analytical lab found that PFBA moves from cupcake liners into cupcakes (CEH 2018).

The FDA has approved 20 next-generation, short-chain PFAS for coating paper and paperboard used to serve food. The FDA Effective Food Contact Substance Notifications database is available online (FDA 2018). Concerns have been raised that these compounds have not been adequately tested for human impact. Because of trade secrecy laws with regard to patents, the government does not publicly disclose the identity of the specific chemicals in food packaging. However, according to

The Intercept (Lerner 2016), in documents filed with the USEPA, under TSCA section 8(e) requirements, DuPont (2010) reported that substitute PFAS, called GenX chemicals, used to produce food contact paper could pose a "substantial risk of injury," including cancerous tumors in the pancreas and testicles, liver damage, kidney disease, and reproductive harm.

The State of Washington has enacted a law to ban PFAS use in food packaging. Not only does PFAS in food packaging pose potential risks to consumers of the food, but the used packaging may end up in compost or landfills. Compost is eventually applied to soil and potentially transferred to certain food crops. If it goes to a landfill, it potentially ends up in the landfill's leachate.

13.1.16 Potential PFAS Contamination in Recycling, Compost, and Fertilizer

Carpeting, furniture, and numerous other items containing PFAS are often recycled. There is concern that the recycled materials are often used in products where the consumer has no way of knowing whether it is has PFAS contamination. Biosolids from wastewater treatment plants are used in some composts and fertilizers and PFAS sampling is not part of the screening process for these products. Additionally, more testing and regulation is needed for land-applied paper mill waste. Paper mill waste is exempt from the Resource Conservation and Recovery Act (RCRA) as a beneficial reuse. Composting of paper mill waste to make fertilizer, which, for example, is still done in Michigan, should get more attention. It is difficult to know which mills make "waterproof" or food contact papers.

13.1.17 Lack of Disclosure by Product Manufacturers

Some stakeholders are concerned that chemical and product manufacturers are not required to disclose when they sell, make, or use PFAS in their products. For example, sturdy, waterproof and heat-resistant products are produced for the construction industry. Additionally, there is lack of disclosure and transparency concerning the composition of AFFF. AFFF suppliers claim that formulations are proprietary.

13.1.18 Lack of Disclosure of Information on the Health Effects of PFAS

Some stakeholders are concerned that politics may delay or even prevent the full disclosure of PFAS toxicity information. For example, the release of ATSDR's Draft Toxicological Profile for PFAS was reportedly delayed because of concerns about the public response. This example, if replicated, leads to distrust and reduces the efficacy of risk communication. Additionally, collected health data may not be clearly and fully shared or explained to stakeholders.

13.1.19 Responsibility for Sampling and Treatment on Private Property

When off-site contamination is suspected or discovered, stakeholders believe that the responsible parties should be accountable for establishing an entire program to deal with the problem. This includes sampling and analysis, disclosure of PFAS content, health monitoring, and if appropriate, remediation and mitigation. Upon detection of PFAS above state or EPA limits, responsible parties should be required to provide affected residents with alternative water supplies. Additionally, stakeholders believe that the cost of the program, including long-term treatment and monitoring, should be borne by responsible parties.

13.1.20 Lack of Scientific Evidence that PFAS Cleanup Methods and Remedies Are Fully Protective of Human and Ecological Health and Prevent Toxic Emissions

Stakeholders believe that treatment systems should be monitored for effectiveness. There is also concern that disposal or regeneration of GAC canisters, resins, and byproducts will add contaminant loads of PFAS compounds to the air, land, and water. Companies that treat spent carbon filters that contain PFAS cannot document full destruction of all PFAS. Some claim all PFAS are destroyed, yet the research they cite is only on PFOS and PFOA destruction.

13.1.21 Stormwater and PFAS Manufacturing Discharges that May Contain PFAS

PFAS, including PFOA, have been detected at the storm drain outfalls at active facilities. Stakeholders are concerned that most NPDES effluent permits do not require PFAS sampling and the magnitude of PFAS concentrations in such discharge remains unknown. Older and inactive facilities' discharge areas, many of which have not been sampled for PFAS, can also act as long-term sources of PFAS in soil.

13.1.22 Psychological Effects

It was reported at one EPA community forum that children in some communities are scared to drink water, and blood level values have become an identity. This has occurred in other communities where contaminated drinking water supplies have

the effect of deterring children from drinking clean water.

13.1.23 Economic Consequences of Local PFAS Contamination

Individuals have voiced concerns about significant economic consequences on property values and businesses. In one instance, because PFAS was detected in water used by dairy cattle, they had difficulty selling the milk products. Stakeholders are particularly concerned about facilities located in economically disadvantaged communities. These communities need the economic benefits of a facility but have few resources to demand enough testing of air emissions and of potential health impacts on the community.

13.2 Specific Tribal Stakeholder Concerns

Tribes share many concerns with other stakeholders; however, they differ from other stakeholders in several key aspects. The 573 federally recognized tribes are each culturally, governmentally, and socially unique. Some tribes view any level of contamination of their lands and natural and cultural resources as unacceptable. Many tribes have culturally significant or sacred areas, which may include springs, mountains, hunting areas, plant-gathering areas, or burial sites. When culturally significant or sacred areas are affected, traditional methodologies that nontribal environmental professionals rely on (such as the applicable exposure scenarios or factors for a risk assessment) may not be sufficient to portray the effect to a tribe. For example, some plants and animals can have tremendous cultural or religious importance to a tribe, including birds and feathers, game animals, and herbs. Additionally, many tribal cultural ceremonies include the use of water. Other areas of difference include diet (for example, some tribes consume more fish per capita) and growing crops or grazing animals on areas fertilized by biosolids from wastewater treatment facilities.

Tribes are sovereign entities that have established government-to-government relationships with federal, state, and local governments—relationships that must be recognized in the decision-making process. When a PFAS-contaminated site affects a tribe, the project timeline must include tribal approvals in addition to other typical agency approvals. Sampling, research, and services on tribal lands generally require institutional review board or tribal council approval. Each sovereign nation operates differently, ranging from tribes that have no research capacity to tribes that have a full review board with a formal application process. The initial steps in the approval process may include drafting a proposal, preparing a poster or podium presentation, and presenting to the tribal government.

Once tribal approval is granted and the project commences, the practitioner must obey tribal protocol with respect to cultural practices. The tribe may reserve the right to retain the findings in the case of exploratory research and restrict publication. Regulatory findings for water and soil concentration, level of treatment, and monitoring are first reported to the tribe’s department of environmental quality or natural resources and then forwarded to state environmental organizations and USEPA.

Most of the tribal concerns are listed in Section 13.1. However, as mentioned above, there may be some distinctions that are important to tribes:

- PFAS in surface waters and lakes may have a higher level of concern when they are used for fishing, given that tribal members rely on these water bodies.
- Drinking water and irrigation water in the arid Southwest are limited, and there is heightened concern that tribes will be unduly impacted if drinking or irrigation water is contaminated.
- Tribal lands are often close to installations that used AFFF (notably DOD) or other industrial sources of PFAS (manufacturers, leather tanneries).
- Where biosolids have been applied to tribal farmlands or grazing lands, there is a need to survey these tribal lands. In some cases, cities may have paid tribal communities to spread biosolids from WWTPs that may have been contaminated with PFAS.
- Activities on and near tribal lands may have involved use of PFAS-containing chemicals that could impact tribal members working in these facilities through inhalation and dermal exposure.
- Landfills on tribal lands that accepted outside waste need to be sampled for PFAS contamination, which may be in the landfill leachate. Companies that paid a fee to the tribes to use their land managed many of these landfills. Although most required sampling, often the sampling plans did not include sampling landfill leachate for PFAS.
- A big issue facing tribes is that tribal environmental offices and budgets are typically small, and they do not have the people or money to perform appropriate site investigations to determine if they have PFAS in their community.

13.3 Stakeholder Resources

Below are a number of resources for communities. These resources are websites of major environmental organizations and projects that specifically deal with PFAS. These groups aim to help environmental and community groups to better understand the issues and science about PFAS.

https://cswab.org/pfas/about-the-pfas-campaign/ and
https://cswab.org/wp-content/uploads/2010/09/List-of-military-fire-and-crash-training-sites-2014.pdf

https://pfasproject.com (A project of Northeastern University)

https://earthjustice.org/features/breaking-down-toxic-pfas

http://www.testingforpease.com

https://www.civilianexposure.org/the-military-covers-up-the-extent-of-pfas-contamination-across-the-country-while-it-continues-to-poison-hundreds-of-communities/

https://toxicfreefuture.org/science/chemicals-of-concern/pfas-nonstick-nightmare/

http://gatehousenews.com/unwellwater/

https://www.ewg.org/interactive-maps/2017_pfa/

https://www.ewg.org/research/report-110-million-americans-could-have-pfas-contaminated-drinking-water

https://www.ewg.org/research/pfas-chemicals-contaminate-us-military-sites

https://www.ewg.org/research/many-fast-food-wrappers-still-coated-pfcs-kin-carcinogenic-teflon-chemical

https://greensciencepolicy.org/highly-fluorinated-chemicals/

https://www.sixclasses.org/videos/highly-fluorinated-chemicals

https://toxicsaction.org/issues/pfas-water-contamination/

https://www.ucsusa.org/center-science-and-democracy/preserving-science-based-safeguards/toxic-threat-pfas-contamination-military-bases

https://www.nrdc.org/experts/anna-reade/epa-finds-replacements-toxic-teflon-chemicals-are-also

https://silentspring.org/research-area/about-highly-fluorinated-chemicals-pfass

https://clu-in.org/contaminantfocus/default.focus/sec/Per-_and_Polyfluoroalkyl_Substances_(PFASs)/cat/Policy_and_Guidance/

USEPA conducted five community engagement events and one event with tribal representatives during the summer of 2018. Meeting materials, information, and summaries of each event are provided on USEPA's website: https://www.epa.gov/pfas/pfas-community-engagement A series-specific topics of concern and associated social factors identified from presentations by public and community stakeholders during the USEPA PFAS community meetings held in 2018 are provided in the ITRC Risk Communication Toolkit for Environmental Issues and Concerns is published as a separate document.

Updated April 14, 2020.

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