

# Proposal for Analysis of Fish from Petersburg, Hoosick Falls and Newburgh for Perfluorinated Compounds Including PFOA and PFOS

Division of Fish and Wildlife, 31 August 2016

**Summary:** DEC fish contaminant monitoring staff and DOH fish consumption advisory staff recommend that fish from waters contaminated by perfluorooctanoic acid (PFOA) at Petersburg and Hoosick Falls and from waters contaminated by perfluorooctane sulfonate (PFOS) at Newburgh be collected and analyzed to provide an initial assessment of the potential bioaccumulation and risk posed by these and other perfluorinated compounds (PFCs).

**Background:** Perfluorinated compounds have been found in the waters of the Little Hoosic River at Petersburg and the Hoosic River at Hoosick Falls, and in the Newburgh water supply catchment. The primary PFCs are PFOA in the Hoosic system and PFOS at Newburgh, although other PFCs have also been found at both areas. While fish are known to bioaccumulate some PFCs, the fish from these waters have not yet been examined for PFC contamination. If found in fish in sufficient concentrations, these chemicals could pose a risk to both human consumers and to fish-eating wildlife.

This proposal for analyzing fish for PFCs was developed through coordination among DOH fish advisory staff, DEC environmental monitoring staff and DEC regional Fisheries managers. Proposed fish collections and laboratory analyses are based on DOH needs for developing advice on fish consumption, DEC requirements to assess food chain effects, regional Fisheries recommendations on availability of species and fishing pressure, and a literature review of fish species and organs most likely to accumulate PFCs.

Analysis of fish for PFCs will allow DEC and DOH to:

- Provide data that New York State can use to develop an informed position on the risks of human fish consumption in these PFC affected areas, as well as in other areas of the state where PFC contamination may be found in the future;
- Evaluate the food chain risks from the consumption of contaminated fish by fish-eating wildlife;
- Better understand the relationship between PFC concentrations in water and in fish;
- Provide comparative information for understanding the prevalence of PFCs in fish from other New York locations; and
- Provide information to the public about PFCs in fish, as has been communicated for other media sampled such as water and soil.

Several fish species will be collected and analyzed from each site because PFC concentrations can be quite variable among species. The target sample number is ten individuals per species per site. This sample size is usually sufficient to provide a reasonable estimate of the mean and variability in contaminant levels along with

information on how concentrations may depend on the size of the fish (e.g., PCBs tend to accumulate more in larger fish).

Fish collections will target waters close to the source of contamination plus one reference site at both the Hoosic system and Newburgh area. If this initial phase of sampling detects concentrations of PFCs that are of concern for humans or wildlife, additional sampling at more distant locations will be necessary to determine the spatial extent of elevated concentrations.

**Sampling Site and Species Selection at Hoosick Falls and Petersburg:** The six sampling sites in the Hoosic and Little Hoosic system are:

- The Hoosic River directly downstream from all of the Village of Hoosick Falls, the Hoosick Falls landfill and the sewage treatment plant;
- The Hoosic River downstream from both the Oak Materials site, where moderate concentrations of PFOA were found in a tributary, and the Hoosick Falls water treatment plant;
- The Little Hoosic River directly below the Taconic Plastics site in Petersburg;
- The stream (H-264-38-9) which receives drainage from the Petersburg landfill;
- Thayer’s Pond, which has potential fishing access and receives highly contaminated leachate from the Hoosick Falls landfill, to examine PFC accumulation in fish from high concentration waters; and
- A reference location in the Little Hoosic River upstream from Taconic Plastics.

The sampling site below the Village of Hoosick Falls, which is furthest downstream, supports a warm water fish community, requiring collection of a corresponding species assemblage. The three other Hoosic and Little Hoosic sites and the stream draining the Petersburg landfill support a cold water fish community, allowing collections to target similar species at all four locations. The fish community at Thayer’s Pond is currently unassessed but is presumably warm water; the pond on the Tyler Mason property near Taconic Plastics also has high PFOA concentrations and is a backup site if sampling is determined to be unfeasible. DEC Fisheries will collect fish from the six locations as follows:

Site	Species	Sample Number
Hoosic River downstream from the Village of Hoosick Falls (also downstream from the Hoosick Falls landfill and sewage treatment plant)	carp, white sucker, rock bass, largemouth bass, yellow perch, minnow species	60
Hoosic River downstream from the Oak Materials site (also downstream from the Hoosick Falls water treatment plant)	rainbow trout, brown trout, white sucker, minnow species	40
Little Hoosic River downstream from Taconic Plastics	rainbow trout, brown trout, white sucker, minnow species	40

Stream receiving drainage from the Petersburg landfill	rainbow trout, brown trout, minnow species	30
Thayer's Pond (Tyler Mason pond as backup)	three sportfish and one minnow species to be determined based on availability	40
Little Hoosic River upstream of Taconic Plastics (reference site)	rainbow trout, brown trout, white sucker, minnow species	40

**Site and Species Selection at Newburgh:** The seven sampling sites in the Newburgh vicinity are:

- Lockwood Basin (also known as Mastersons Pond or Lake): this water body can receive water from Lake Washington and has public fishing access;
- Lake Washington, a contaminated water body of primary concern due to its former use as a public water supply;
- Recreation Pond (P5609): in the absence of public access, sampling is focused on species consumed by wildlife in this pond with high PFOS water concentrations;
- Moodna Creek just below the confluence with Silver Stream: this site is downstream from most of the contaminated waters and will help determine whether fish from sites further downstream might have elevated PFC concentrations;
- Beaverdam Lake: this lake is surrounded by houses and has PFOS in the water;
- The stream (H-89-12-P234-1) leading from the pond in Stewart State Forest (P5608) to Beaverdam Lake: this stream had moderate PFOS concentrations and is expected to have small individuals of a few sportfish species; it will be sampled as far upstream as practical because PFOS concentrations increased upstream; and
- Brown's Pond (P226a): this will function as a reference site.

All of these water bodies support a warm water fish species community. Species targets are based on Region 3 Fisheries records and assessment of likely species; species actually collected will depend on availability. DEC Fisheries will collect fish from these locations as follows:

Site	Species	Sample Number
Lockwood Basin (P225a)	largemouth bass, pumpkinseed sunfish, brown bullhead, white perch, carp, minnow species	60
Lake Washington (P225)	largemouth bass, bluegill (although mostly small), yellow perch, brown bullhead, minnow species	50

Recreation Pond (P5609)	most abundant sunfish species and minnow species	20
Moodna Creek just below the confluence with Silver Stream	most abundant sunfish species, brown bullhead, white sucker, minnow species	40
Beaverdam Lake	up to four sportfish species, minnow species	50
Stream between pond in Stewart State Forest and Beaverdam Lake	up to three sportfish species, minnow species	40
Brown's Pond (P226a) (reference site)	largemouth bass, most abundant sunfish species, yellow or white perch, brown bullhead, minnow species	50

**Chemical Analysis:** Fish will be analyzed by AXYS Analytical Services Ltd. using DEC's existing analytical services contract. An increase in the contract cap will, however, be required and the contract expires at the end of February 2017.

AXYS reports 13 PFCs including PFOA and PFOS. Also reported are perfluoroheptanoic acid (PFHpA) and perfluorohexanesulfonate (PFHxS), which were found in appreciable concentrations in surface water of the Hoosic and Newburgh areas, respectively. Minnows will be analyzed as composites of whole fish. The other fish species, to be evaluated for both human consumption and food chain impacts, will be analyzed in three portions:

- Standard fillet: This is the edible portion that will be used by DOH to evaluate risk to human health.
- Viscera: Some PFCs, including PFOS and PFOA, concentrate in the viscera. This preparation will be used to assess bioaccumulation and biomagnification, particularly if concentrations in other parts of the fish are low.
- Remainder of the fish: The concentration from the remainder of the fish will be combined with the results from the standard fillet and viscera to determine the whole fish concentration. This calculated value will be used to assess risk to fish-eating wildlife and food chain effects.

As is standard for contaminant analysis, all fish will also be analyzed for percent lipid and percent moisture.

**Analysis, Interpretation and Public Communication:** DEC and DOH will collaborate on data analysis, risk assessment and communication in accordance with the 1985 Policy on Contaminants in Fish.

- DEC will review results from the analytical laboratory and develop a data usability statement. Data will be distributed to appropriate DOH and DEC staff for human health and ecological risk evaluation.

- DOH will use its standard risk management approach to evaluate the data and provide advice consistent with the normal fish consumption advisory process. DOH may also perform a risk characterization for PFCs in fish and inform the public apart from the normal fish consumption advisory process.
- DEC will follow procedures specified in DEC regulations to assess risk to fish and wildlife by identifying appropriate acute and chronic toxicity thresholds, evaluating potential exposure and uptake by aquatic organisms, and quantifying exposures to organisms higher in the food chain.
- Human health advice and ecological risk may be communicated to the public using one or more of the following approaches: direct communication with municipal officials or the public, posting on the DOH fish advisory webpage, posting as Q&As on DOH or DEC websites, or incorporation in printed fish advisory materials and the fishing regulations guide.

**Time Line:** The anticipated time to complete the project following approval and initiation of fish sampling is 11 months. This schedule does not account for any time needed to increase the spending cap on the analytical services contract with AXYS Analytical Services to include the proposed analyses.

- Develop work plan: 1 month.
- Collection of fish: 1 month. The latest possible fish collection date is October 31.
- Laboratory analysis: 5 months.
- Data quality review: 1 month.
- Data evaluation and interpretation, DOH for human health and DEC for wildlife risk: 2 months.
- Communication of findings: 1 month.

Data quality review, evaluation and some interpretation will be ongoing once analytical results begin to come in so that preliminary findings will become available before the full 11 months of the project.

**PCBs:** Due to previous PCB contamination of the Hoosic River from upstream sources including North Adams, Massachusetts, DOH requests PCB analysis of standard fillets of selected edible fish to update the fish consumption advisory that applies to the Hoosic River. The advisory also applies to the Little Hoosic River as far as the first impassable barrier at the falls at Route 2. Analyzing fish for PCBs would make efficient use of fish already collected. As with the PFCs, analysis would be done by AXYS Analytical Services using DEC's analytical services contract.

Species to be analyzed are carp and largemouth bass from the Hoosic River below Hoosick Falls, rainbow trout and brown trout from the Hoosic River below Oak Materials, and brown trout or rainbow trout as available from the outflow stream from the Petersburg landfill.