Frequently Asked Questions (FAQs)

A. Basics – PCBs in the Hudson River

1. **What are PCBs?**
   PCBs or polychlorinated biphenyls are a class of chemicals consisting of 209 individual compounds. PCBs were widely used as a fire preventive and insulator in the manufacture of transformers and capacitors because of their ability to withstand exceptionally high temperatures.

2. **What are "Tri-Plus" PCBs and why are they important in the Hudson?**
   PCBs include over 200 related compounds. One way in which these compounds vary is the number of chlorine atoms in each molecule. Those PCB compounds with three or more chlorine atoms in each molecule are known as Tri-Plus (or Tri+) and are generally considered more dangerous to humans and other animals than those with only one or two chlorine atoms in each molecule, given that this group of PCBs are more prone to bioaccumulate in fish and other animals. In evaluating PCBs in the Hudson River, and in developing a plan to address those PCBs, the U.S. Environmental Protection Agency (EPA) focused on Tri-Plus PCBs. However, Total PCBs are also an important metric, and EPA continues to consider both.

3. **What are bioaccumulation and biomagnification?**
   Bioaccumulation refers to the process by which contaminants such as PCBs accumulate or build up in the tissue of organisms. PCBs concentrate in various portions of tissue and internal organs, depending on the organism. Small animals like worms live in and on the sediment in the river where they accumulate PCBs. PCBs also accumulate in humans who eat fish contaminated with PCBs.

Biomagnification is the process by which tissue concentrations of bioaccumulated chemicals increase as the chemical passes up through two or more feeding levels. For example, the worms that live in and on the sediment are eaten by small fish, which are in turn eaten by larger fish, which may in turn be eaten by humans and wildlife like eagles, osprey, mink or otter. In each step along the way, the PCB tissue concentrations may increase from one feeding level to the next.

4. **How did GE release PCBs into the Hudson?**
   The Upper Hudson River has been contaminated with PCBs as a result of industrial discharges that primarily occurred between the 1940s and 1970s. PCBs were discharged to the river from the General Electric (GE) manufacturing plants in Hudson Falls and Fort Edward, NY and were subsequently transported downstream. Once PCBs entered the river, they were mixed with water, sediment and wood debris. During flooding, contaminated sediment and wood debris from the river were deposited in some parts of the floodplain.

5. **Do PCBs break down over time?**
   Yes, but the process can take decades or longer. One reason PCBs were widely used until the 1970s is that this large group of related chemicals does not easily break down over time, or in the presence of heat or pressure. This feature made them desirable for their intended uses, but it also means that decades after their production ended, PCBs are found almost everywhere around the globe. When PCBs are discharged into the environment, as happened in the Hudson River, a certain amount of "de-chlorination" does take place over time. Consequently, the amount of Tri+ PCBs may be somewhat reduced, as higher-chlorinated molecules lose chlorine atoms. However, the rate of breakdown is slow, and even the lower-chlorinated compounds present some risk, so EPA determined that natural breakdown was not by itself sufficient to address the concerns posed by PCBs in the Hudson.

6. **How do PCBs in fish affect public health and the environment?**
   If people eat fish that have PCBs, the PCBs will accumulate in their bodies. PCBs are classified by the EPA as probable human carcinogens. In addition, EPA recognizes neurological and developmental effects as additional toxic effects of PCBs. The Agency considers all PCB mixtures to be toxic.

   The New York State Department of Health (NYSDOH) has issued advisories for the Upper, Mid and Lower portions of the Hudson River which prohibit consumption of fish and recommend strict limitations on consumption of fish. The health advisories for the Upper Hudson River were issued because of PCB contamination in fish. Regulations issued by the New York State Department of Environmental Conservation (NYSDEC) prohibit possession or taking of fish from the Upper Hudson River. However, EPA is aware that some anglers may decide to ignore these advisories and regulations and eat the fish they catch from the river. EPA is working with New York State to continue to improve the outreach efforts to inform anglers about the importance of following the advisories and regulations. More information about the NYSDOH Hudson River Fish Advisory Outreach Project is available on the NYSDOH Hudson River webpage.

7. **Why does EPA study fish samples and what are the target levels of PCBs in fish?**

The purpose of the sampling is to determine the levels of PCBs in fish tissue, as humans and other animals are exposed to PCBs in the river through fish consumption. In the 2002 Record of Decision (ROD), EPA identified a long-term goal of 0.05 milligrams of PCBs per kilogram (mg/kg) of fish tissue, a level that EPA determined would allow people to eat one fish meal every week. That risk and science-based determination was made in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) and was based on extensive toxicological research.

In the 2002 ROD, EPA explained that modeling the Agency had conducted indicated that it would take more than five decades for PCB concentrations in fish to reach the 0.05 mg/kg goal in the Upper Hudson River as a whole, even if the most aggressive dredging remedial alternative was selected. However, EPA established two interim target concentrations for improved fish tissue PCB levels that it projects will be achieved more quickly and can be used to track the progress of the fish recovery. When fish tissue samples indicate PCB concentrations have diminished to 0.4 mg/kg, this would allow people to eat one fish meal every two months; and when PCB concentrations in fish tissue reach 0.2 mg/kg, this would enable people to eat one fish meal every month. In the ROD, EPA estimated that these interim target concentrations would be met in the Upper Hudson River as a whole in about five and 16 years, respectively, after the completion of dredging. Dredging was completed in 2015. NYSDOH may adjust health advisories for specific areas or specific fish species depending on the progress of the fish recovery. EPA will work closely with NYSDOH as it considers modification of fish consumption advisories.

8. **Is it safe to swim in the river?**

There are some general precautions that EPA and the New York State Department of Health (NYSDOH) suggest that people take regarding swimming or other recreational use of the Hudson River. These precautions are important because rivers and lakes may contain microorganisms (including bacteria, parasites and viruses), contaminants (including PCBs) and other hazards. The NYSDOH advises that people swim at beaches regulated by the state, counties, towns or villages when possible, because these are monitored for safety and health hazards. Precautions include the following:

- Consider keeping your face and head out of the water when swimming and avoid swallowing water.
- Avoid swimming in cloudy or discolored water as it may contain more microorganisms or other contaminants.
- Wash your hands after swimming, especially before eating, and shower when you are done swimming for the day to wash off river water and sediment.
- Take extra precautions near any dams or large watercraft because they can create undertows and dangerous currents. Never cross safety wires and other water hazard markers when recreating near dams.

9. **My community gets drinking water from the Hudson River – is my water safe to drink?**

There are several public water systems that use Hudson River water. The New York State Department of Health (NYSDOH) is responsible for overseeing public water systems in the state. Public water systems are required to monitor PCB levels in treated water for compliance with appropriate standards, including the federal drinking water standard for PCBs. EPA is not aware of any water system that uses Hudson River water that does not conform to federal and state health standards for PCBs. As required by EPA, GE also monitors the river for the presence of PCBs at various locations in the Upper and Lower Hudson River. This monitoring is done on a regular basis, including during high flow conditions when PCB levels tend to increase slightly.

B. EPA's Superfund Authorities and Current Legal Agreements

10. What is EPA's role in cleaning up the Hudson River under the National Priorities List (Superfund) designation?

For sites such as the Hudson River PCBs site, which are on the Superfund National Priorities List (NPL) and for which EPA is the lead agency, EPA has the responsibility of selecting the cleanup remedy, and either carrying out the cleanup work using government funding, or supervising cleanup work carried out by potentially responsible parties (PRPs).

11. What is a Record of Decision (ROD) and what RODs have been issued for the Hudson River PCBs site?

Comprehensive Environmental Response, Compensation, and Liability Act (commonly referred to as Superfund), it is EPA's obligation to select a cleanup remedy for sites on the National Priorities List (NPL). The Record of Decision, or ROD, is the document in which EPA publishes its decision on the selected remedy. The remedy selection process for NPL sites requires that EPA follow certain steps before issuing a final decision. First, a detailed evaluation, called a Remedial Investigation (RI) and Feasibility Study (FS), is carried out. The purpose of the RI is to identify the nature and extent of contamination - what hazardous substances, pollutants or contamination are present, where they are coming from, where they are now and where they might go in the future; and what risks those substances pose to people and the ecosystem. The purpose of the FS is to thoroughly evaluate available cleanup options for addressing unacceptable risks identified in the RI. After the completion of the RI/FS, EPA publishes a proposed cleanup plan, which is then open for public comment and is discussed at one or more public meetings. After the comment period, EPA carefully considers all the comments received, and then makes a remedy decision which is memorialized in the ROD.

For the Hudson River PCBs Superfund site, EPA has issued two RODs to date. The first, issued in 1984, called for the containment of "remnant sites" where PCB-contaminated sediment was left exposed along the shoreline when the water level went down after a dam near Fort Edward was removed. The 1984 ROD also called for an evaluation of the downstream domestic water supply at Waterford, New York; selected an interim "No Action" decision for PCB-contaminated sediment in the Upper Hudson; and indicated that both the No-Action decision for the sediment and the containment remedy for the remnant sites could be reexamined in the future.

The 1984 No-Action decision for the Upper Hudson River sediments was reexamined during the 1990s. The reexamination culminated in the second ROD, issued in 2002, which addressed PCBs in sediment in a 40-mile stretch of the Upper Hudson River from Fort Edward south to the federal dam at Troy. More information about the specific requirements of the 2002 ROD is found in Section C.

The New York State Department of Environmental Conservation concurred with both the 1984 and the 2002 RODs.

EPA is also continuing its investigation of PCB contamination in the Upper Hudson River floodplain and initiating supplemental studies in the Lower Hudson River (see Sections E and F).

12. What is the 2006 Consent Decree (CD) for the Upper Hudson and what does it cover?

The 2006 legal agreement between EPA and GE, called a judicial Consent Decree, requires GE to perform the remedy selected by EPA in the 2002 Record of Decision (ROD). The State of New York participated in the negotiations between EPA and GE but was not a party to the CD. In general, the work covered by the CD includes sampling, dredging of contaminated sediment, capping, monitoring, maintenance of caps, and reconstruction of habitat and areas of the shoreline. Quality of life standards were set to minimize any negative impacts of the massive project; these included standards addressing air emissions, noise and nighttime lighting.

The Consent Decree provided for the review of the first year of dredging by a panel of independent scientists, which recommended refinements to the dredging operations for the remainder of the project. Based on these recommendations, EPA identified engineering and other modifications that were incorporated into the remaining five years of the dredging operations.

Under the Consent Decree, EPA reviewed GE's detailed workplans in advance, closely monitored GE's performance of the work, and reviewed sampling results throughout the process. These reviews were carried out by EPA in consultation with New York State and the federal natural resource trustees (the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Fish & Wildlife Service (FWS)). EPA will continue to oversee GE's performance of the long-term operation, maintenance and monitoring program under the CD.

13. What are the "reopener" provisions in the Consent Decree? Who can invoke a reopener?

A "reopener" is a provision in a judicial Consent Decree that allows EPA, under specified circumstances, to seek additional relief in a matter that was resolved through the CD.

The 2006 Consent Decree with GE for the Hudson River PCBs site includes "reopener" provisions which allow EPA, under specified circumstances, to seek additional remedial work in the Upper Hudson River. The CD specifies the scientific and legal determinations EPA would have to make to trigger a reopener provision. In summary, if EPA receives new information which, together with other relevant information (including previously collected data and analyses), leads EPA to conclude that the remedy is not protective of human health or the environment, and EPA also concludes that

specified additional work would address or respond to EPA's determination that the remedy is not protective, EPA can direct GE to carry out such additional work. New information would include any fish tissue data collected in the future.

14. What are GE's responsibilities to EPA under the Superfund law for PCB contamination in the Hudson?

GE is responsible for the PCBs it discharged into the Hudson River from its two former manufacturing plants at Fort Edward and Hudson Falls, about 40 and 43 miles north of Albany, respectively. These PCBs contaminated the river and its sediment from the Hudson Falls plant all the way down to New York Harbor, and contaminated certain areas of the floodplain along the banks of the river during high water and flood events.

Under the Superfund law, GE is legally responsible to EPA for its PCBs, wherever in the Hudson River system they come to be located, including in the Hudson River floodplain. This includes responsibility for the performance of, and payment for, response actions to address the PCB contamination.

15. How is the cleanup work paid for?

The Superfund law created several categories of entities that are responsible for the costs of hazardous substance cleanup. Where such parties can be identified, and if they have the financial capability, they will be expected to pay for or carry out the cleanup work. If no such parties can be found, or if the identified parties have insufficient funds, then the money for the cleanup typically comes from the federal and state government.

16. When will GE's Superfund responsibility for PCBs in the Hudson end?

The short answer is that the General Electric Company's responsibilities for PCB cleanup will not end until EPA has assessed the full length of the Hudson River, including the floodplain, and any cleanup work associated with these assessments are performed to EPA's satisfaction in order to achieve protectiveness goals established by EPA. GE's responsibilities for continued maintenance and monitoring will continue even beyond the completion of any active cleanup work, indefinitely into the future. And GE is also responsible for additional work in the Upper Hudson River if EPA concludes that the conditions for the reopener are met. (See the answer to Question 13.)

GE's obligations under the 2006 Consent Decree with respect to PCB contamination in the sediments of the 40-mile stretch of the Upper Hudson River will continue until EPA determines that GE has completed all the activities required of the company under the Consent Decree. Such a determination would be subject to the reopeners. (See the answer to Question 13.)

EPA does not foresee that the ultimate remediation goal for fish tissue - 0.05 mg/kg of PCBs - established in the 2002 ROD, will be achieved throughout the Upper Hudson for more than five decades. This was clearly articulated in the ROD.

Under a 1990 Consent Decree with EPA, GE is also required to monitor and maintain the caps placed on the remnant deposits – which are areas of contaminated sediment along the banks of the Hudson River between Fort Edward and Hudson Falls – for the foreseeable future.

After EPA makes a remedy selection decision for the Hudson River floodplain consistent with the Superfund statute (see Section E), EPA anticipates that GE will perform any remedy selected by the Agency, under either a judicial consent decree or an EPA administrative order.

EPA has informed the public that it is important to collect additional data and conduct supplemental studies in order to better understand the PCB contamination in the Lower Hudson River (see Section F). GE's obligations, and the obligations of any other parties, with respect to the Lower Hudson will be defined as that process proceeds.

In addition, the federal and state Hudson River Natural Resource Trustees have potential claims against GE for natural resource damages in connection with the Hudson (see Section G). As EPA is not a Natural Resource Trustee agency, EPA cannot address the question of when GE's responsibility for natural resource damages regarding the Hudson will end.

17. What is the certification of completion, as specified in the 2006 Consent Decree?

There are three separate certifications of completion that GE may request from EPA under the 2006 Consent Decree:

(a) The "Certification of Completion of Phase 1 Field Activities," which was already provided to GE by EPA in 2012 after it completed the first year of dredging.

(b) The "Certification of Completion of the Remedial Action," which was issued to GE by EPA in 2019.

(c) The "Certification of Completion of the Work," which would certify that all work required under the CD has been completed. This certification is not expected to be available to GE for, at the least, five decades.

18. What is the "Certification of Completion of the Remedial Action"?

Under the 2006 judicial Consent Decree, GE is required to submit a detailed report demonstrating that it properly conducted all of the construction activities (including the dredging, backfilling and capping, habitat reconstruction, and treatment plant decontamination and decommissioning) required under the Consent Decree. These construction-related activities are defined in the CD by the term "Remedial Action." Other activities such as the extensive operation, maintenance and monitoring work also covered by the CD, are explicitly excluded from the CD definition of the term "Remedial Action." Once GE has completed the activities covered by the CD term "Remedial Action," the company may request what is called in the CD a "Certification of Completion of the Remedial Action." GE submitted its request for this certification in early 2017.

Under the Consent Decree, GE is entitled to receive from EPA the Certification of Completion of Remedial Action if EPA concludes that the Remedial Action, as that term is defined in the CD, has been performed in accordance with the CD.

During the years that GE performed the dredging and related tasks (i.e., 2007 through 2016), EPA – in consultation with NYSDEC – approved GE's performance of each discrete task as it was completed. It is important that EPA act in good faith, predictably and reliably, to fulfill its obligations under the agreed-upon terms of the judicial Consent Decree, just as EPA expects GE to fulfill its obligations.

Accordingly, EPA has issued the Certification of Completion of the Remedial Action, indicating that GE has properly completed the dredging and other construction activities required by the Consent Decree. This certification does not in any way indicate that the cleanup of the Upper Hudson is over. GE remains obligated to do much additional work under the Consent Decree, including monitoring of PCBs in fish, sediment and water, and monitoring and maintenance of caps placed on the river bottom. That work will continue for many years. And GE remains subject to the reopeners in the Consent Decree. Once all the work required by the Consent Decree is complete, the CD authorizes EPA to issue a further certification, known as the "Certification of Completion of the Work." EPA does not expect that certification to be available to GE for, at the least, five decades.

19. What is the "Certification of Completion of the Work" and how is that different from the "Certification of Completion of the Remedial Action"?

The "Certification of Completion of the Work" is the last of three certifications that GE may request under the 2006 Consent Decree, and is the one which would affirm that GE's responsibility for work in the Upper Hudson River under the provisions of the 2006 Consent Decree has been fulfilled, absolving GE of any further obligations for the specific cleanup activities called for under that Decree. Nonetheless, further work in the Upper Hudson River can be required under the reopener provisions of the Consent Decree.

The first of the three certifications provided for under the Consent Decree is the "Certification of Completion of Phase 1 Field Activities;" the second is the "Certification of Completion of the Remedial Action;" and the third is the "Certification of Completion of the Work." The first certification was provided to GE in 2012 after completion of Phase 1 (the first year of dredging). Under the Consent Decree, GE requested the second certification (Completion of the Remedial Action) after the actual construction activities required under the Consent Decree had been completed (i.e., dredging, backfilling and necessary capping, treatment plant decontamination and decommissioning, etc.), and EPA issued that certification in 2019. GE can only request the third and final "Certification of Completion of the Work" after GE has performed all the work required of it pursuant to the Consent Decree (e.g., under the Operation, Maintenance and Monitoring Plan). This third certification is not expected to be available to GE, at the earliest, for five decades.

20. Does issuance to GE of the "Certification of Completion of the Remedial Action" mean that the company has no further obligations in the Hudson River?

No. GE remains responsible for significant further work under the Consent Decree. For example, GE remains obligated to conduct an extensive program that includes monitoring of sediment, water quality and fish; and monitoring the integrity and effectiveness of the caps that were installed in certain parts of the Upper Hudson River, and repairing them should any damage occur. In addition, this certification does not affect EPA's authority to invoke a "reopener" provision in the Consent Decree if appropriate, requiring additional work in the Upper Hudson River. This certification also does not affect EPA's authority to require performance of investigations and cleanup work in the Upper Hudson River floodplain and the Lower Hudson River (discussed in Sections E and F).

21. What is a "covenant not to sue" and how does it relate to the issuance of the "Certification of Completion of the Remedial Action"?

A "covenant not to sue" is a promise by one party to the settlement of a lawsuit that it will not sue the other party for certain specified claims, *provided the other party fulfills its end of the agreement*. Under the Consent Decree (CD) between EPA and GE, entered in 2006, GE is entitled to certain covenants not to sue when it fulfills specific obligations under the CD. In particular, when EPA issued the "Certification of Completion of the Remedial Action" (see the answers to Questions 17-20), EPA's covenant not to sue GE again for cleanup of the PCB contamination in sediments of the Upper Hudson River took effect. This does *not* mean that GE is relieved of all further responsibilities in the Upper Hudson River, or elsewhere in the Hudson, under the Superfund law or the Consent Decree. First, GE has many additional obligations under the Consent Decree, which the company is required to fulfill (see the answer to Question 20). Second, as explained in the answer to Question 13, the Consent Decree contains "reopeners" pursuant to which, under specified circumstances, EPA can take action to require GE to conduct further cleanup or other action in the Upper Hudson River. Third, the covenant not to sue does not extend to the Upper Hudson River floodplain or the Lower Hudson River.

22. What is the standard for deleting a Superfund site from the NPL and how is that different from the "Certification of Completion of the Remedial Action" and the "Certification of Completion of the Work"?

A Superfund site can be deleted from the National Priorities List (NPL) once all response actions are complete and all cleanup goals have been achieved. EPA is responsible for processing deletions with concurrence from the state in which the site is located. Deleted sites may still require five-year reviews to assess whether human health and the environment continue to be protected. If future site conditions warrant, additional response actions can be taken, using the Superfund trust fund or by potentially responsible parties. Relisting on the NPL is not necessary; however, sites can be restored to the NPL if extensive response work is required. EPA can also delete from the NPL portions of sites that meet deletion criteria. The deletion of a site from the NPL is a regulatory process that requires public notice and comment, whereas the issuance of the "Certification of Completion of the Remedial Action" or of the "Certification of Completion of the Work" is an action taken by EPA under the Consent Decree.

23. Can EPA require GE to do more active remediation work in the Upper Hudson River, even after the "Certification of the Completion of the Remedial Action" has been issued?

Yes, under specified circumstances. The 2006 Consent Decree between EPA and GE includes several "reopener" provisions. If EPA makes certain specified determinations, EPA can direct GE to carry out additional remedial work in the Upper Hudson River that was not called for in the original cleanup decision and that GE was not originally required to perform.

The Consent Decree specifies the determinations EPA would have to make to trigger the reopener provision. In summary, if EPA receives new information which, together with other relevant information, (including previously collected data and analyses), leads EPA to conclude that the remedy is not protective of human health or the environment, and EPA also concludes that additional work would address or respond to EPA's determination that the remedy is not protective, EPA can direct GE to carry out such additional work. New information would include any fish tissue data collected in the future.

24. What other work is being done to address PCB contamination in the Hudson River?

In addition to the dredging of contaminated sediments in the Upper Hudson River and related work, investigations are also underway to assess potential PCB contamination in the Upper Hudson River floodplain (between Hudson Falls and Troy), and are expected to begin in 2019 in the Lower Hudson River (between Troy and New York City). These investigations are addressed, respectively, in Sections E and F.

C. Status of the 2002 Remedy Selected for the Upper Hudson River, and the Second Five Year Review Report

25. What is the current status of the cleanup of PCBs in the Upper Hudson River?

GE has completed the dredging, backfilling and capping, habitat reconstruction, and treatment plant decontamination and decommissioning it was required to perform under the Consent Decree. GE remains obligated to carry out an extensive Operation, Maintenance and Monitoring plan for decades to come. In addition, under the Consent Decree, EPA has the ability to trigger a "reopener" under specified circumstances; if these circumstances occur, EPA could direct GE to carry out additional cleanup work in the Upper Hudson River (see answer to Question 13). Separately, GE, with EPA oversight, is conducting an investigation of PCB contamination in the Upper Hudson River floodplains.

26. What dredging was called for under the 2002 ROD, and when was that dredging conducted?

In 2002 EPA issued a Record of Decision calling for the targeted environmental dredging of approximately 2.65 million cubic yards of PCB-contaminated sediment from a 40-mile stretch of the Upper Hudson River between Fort Edward and Troy, NY, followed by a period of monitored natural recovery predicted to extend more than five decades. Both elements - the dredging and the natural recovery - are essential components of the remedy selected in the 2002 ROD. The State of New York concurred with the 2002 ROD.

The dredging and capping work in the Upper Hudson River was conducted between 2009 and 2015. This work occurred in two phases. The first phase of the work began in May 2009 and ended in November 2009. During this phase, General Electric removed approximately 283,000 cubic yards of PCB-contaminated sediment from a six-mile stretch of the Hudson River near Fort Edward.

This first phase of the project was followed by an evaluation by an independent group of scientific experts of data collected during the first phase. No dredging occurred during 2010 while this review was underway. After the review, improvements were made to the project design to increase productivity and reduce the resuspension of dredged sediment.

The second and final phase of the dredging in the Upper Hudson River began in June 2011. Overall for the six seasons of dredging, approximately 2.75 million cubic yards of contaminated sediment was removed from the river bottom – about 100,000 cubic yards more than originally projected in the ROD. About 310,000 pounds of PCBs were removed through the dredging – about twice the amount projected in the ROD. The dredging removed about 72 percent of the total pounds of PCBs estimated to have been in the 40-mile stretch of the Upper Hudson (more than the 65 percent removal estimated in the ROD).

During 2016, GE performed other required work, including habitat reconstruction and treatment facility decontamination and decommissioning.

27. How are "scopes of work" developed for a cleanup?

Work at National Priorities List Superfund sites – including sampling, analysis, related studies, design and construction – requires careful planning and execution, and must be carefully supervised. That planning is typically initiated by developing a detailed statement of work or scope of work (SOW) which is typically included as part of a legally binding consent decree. Over the decades during which the Superfund program has been active, standardized SOWs for common types of work have been developed. But each site is different, so the SOWs must be carefully developed with site-specific considerations in mind.

28. What happened to the sediment after it was dredged from the river?

Sediment removed from the river was transported by a fleet of barges to a sediment dewatering facility located on the Champlain Canal in Fort Edward, NY. At the facility, the water was squeezed from the sediment and treated onsite to a level that met standards for drinking water before being returned to the Champlain Canal. The dewatered sediment was then loaded onto railcars for transport to a series of EPA-approved permitted out-of-state landfills.

29. What happened to the sediment processing facility after the dredging was completed?

GE's 100-acre processing facility in Fort Edward, NY, which was built to process and transport the dredged material offsite, was taken apart and decontaminated in 2016 in accordance with an EPA-approved facility demobilization and restoration plan. The properties on which the GE facility was built are being returned to their respective owners. The primary property owner is exploring

opportunities for reuse of the site to support future economic development in coordination with the town and village of Fort Edward. The properties have been left with valuable infrastructure in place, such as seven miles of railroad track and a large wharf along the Champlain Canal. Property originally owned by New York State, which included the wharf property, is expected to be returned to the state with the infrastructure improvements.

30. What is "natural attenuation" (also called "natural recovery") and how does it fit into the remediation of the Hudson River?

"Monitored natural attenuation" (MNA), also called "monitored natural recovery" (MNR), is a risk reduction approach that uses ongoing, naturally occurring processes to contain, destroy, or reduce the availability or toxicity of contaminants in sediment to living organisms. Monitoring of the ecosystem during MNA ensures that the conditions needed for MNA are occurring and that progress is being made towards cleanup goals.

The primary MNA processes that occur in the Hudson River include cleaner sediment entering the river from upstream and tributaries; sediment movement and/burial; and PCBs binding to organic matter, making them less bioavailable. MNA is often a necessary and relied upon process at contaminated sediment sites such as the Hudson River, where contaminants have been distributed over large areas.

EPA's 2002 Record of Decision (ROD) for the Upper Hudson River explicitly relied on two elements to protect and restore the river. In addition to dredging, the ROD also relied on MNA. With the dredging now having been completed by GE, the remedy for the Upper Hudson has entered the MNA phase. The ROD specifically recognized that more than five decades of MNA would be required before the goals could be met.

The extensive monitoring of sediments, water quality and fish tissue that are required under the Operation, Maintenance and Monitoring program that GE must carry out under the Consent Decree will provide data to assess how natural attenuation is proceeding.

It is important to note that EPA's work to address PCB contamination in the Hudson is multi-faceted. While EPA, its partners, and the public continue to focus intensively on post-dredging recovery of the Upper Hudson, EPA is also continuing its investigation of PCB contamination in the Upper Hudson River floodplain and initiating supplemental studies in the Lower Hudson River (see Sections E and F).

31. Why will it take the river so long to recover?

The slow recovery is due to the nature of the contamination and is not unique to the Hudson (see the answer to Question 35). There is no doubt that the dredging remedy greatly accelerated the recovery of the river by removing PCB contaminated sediment or (in a few locations) covering them over so the contamination is not readily available to fish. As fish in the Hudson are already contaminated, even shutting off the source of PCBs completely would not result in immediate recovery. Some PCBs remain in river sediment and continue to bioaccumulate in fish. It takes decades for PCB levels in fish

populations to diminish to levels that would allow more frequent (weekly) fish consumption by people. There are two interim targets along the way that EPA expects to meet more quickly. When fish tissue samples indicate PCB concentrations have diminished to 0.4 mg/kg, this would allow people to eat one fish meal every two months; and when PCB concentrations in fish tissue reach 0.2 mg/kg, this would enable people to eat one fish meal every month. EPA estimated in the 2002 Record of Decision that these interim target concentrations would be met in the Upper Hudson River as a whole in about five and 16 years, respectively, after the completion of dredging. As PCB levels in fish populations continue to diminish, the risks to ecological receptors (other animals) will also continue to decline.

32. Would more dredging make the river recover faster?

In the 2002 Record of Decision EPA did evaluate a much more aggressive dredging option than the one selected. EPA's evaluation determined that this option – which was even more aggressive than some commenters have recently called for – would only have accelerated fish recovery by a few years. Also, it would have extended the duration of disruption to riverside communities. This option had a significantly greater cost, with minimal benefit, compared with the one selected. EPA, therefore, did not select the more aggressive remedy.

33. How do the timeframes for Upper Hudson River fish recovery compare to (a) the project that was implemented, (b) doing nothing, and (c) the most aggressive dredging option that was considered?

Before EPA issued its 2002 Record of Decision, the agency evaluated a number of different options including: (a) the project that was ultimately selected and implemented, (b) doing nothing, and (c) a more aggressive alternative involving much more dredging.

In general, no option was predicted to show full recovery of the entire Upper Hudson within the timeframe of the computer models used, which extended about 55 years after the end of dredging (although the models did project that the selected remedy would meet the human health remediation goal of 0.05 parts per million PCBs in fish in River Section 3, the 29 mile stretch of the Upper Hudson from Schuylerville to Troy, in about 43 years). (The 2002 ROD analyzed the Upper Hudson River in three "River Sections."

Moving downstream from Fort Edward, the lengths of River Sections 1 through 3 are about six, five, and 29 miles, respectively.) EPA therefore estimated when two important interim target concentrations in fish tissue would be reached under the different options: (1) when PCBs in fish tissue would get down to 0.4 mg/kg, allowing consumption of one fish meal every two months; and (2) when PCBs in fish would get down to 0.2 mg/kg, allowing consumption of one fish meal every month.

The model showed that doing nothing would not achieve the human health remediation goal of 0.05 parts per million PCBs in fish for River Section 1, River Section 2, or for the Upper Hudson River as a whole, within the modeling time frame, but predicted that it would be achieved in about 50 years in River Section 3.

By comparison, modeling of the alternative that EPA selected estimated that, in the Upper Hudson River as a whole, the first interim target concentration (0.4 mg/kg) would be met in about five years after the completion of dredging, and the second interim target (0.2 mg/kg) would be met in about 16 years after the completion of dredging. PCB concentrations in fish would continue to decline thereafter, though as noted above, the modeling did not project that in the Upper Hudson as a whole, fish tissue concentrations of PCBs would reach the ultimate goal (0.05 mg/kg, which represents when people would be able to eat one fish meal per week) within the approximate 55-year post-dredging modeling timeframe.

EPA also modeled a considerably more aggressive dredging option, one even more aggressive than what a number of stakeholders are now calling for. That option was predicted to accelerate the achievement of the two interim target concentrations by only a few years; specifically, in the Upper Hudson River as a whole, the first target (0.4 mg/kg) was projected to be attained about two years earlier under the more aggressive option, and the second target (0.2 mg/kg) was projected to be achieved about six years earlier than under the option EPA selected.

EPA did not select this much more aggressive option because it would be significantly more expensive and take longer to implement than the remedy EPA selected, without being substantially better in the amount of ecological or human health risk reduction.

34. Does EPA still believe that the fish will recover in the timeframes projected in the 2002 Record of Decision?

Based on modeling, EPA's 2002 ROD projected that the "average" fish in the 40-mile stretch of the Upper Hudson would reach the first target concentration (0.4 mg/kg) within about five years after the completion of dredging. A model is just that - a forecast of the future based on assumptions about the relationships between sediment contamination, water contamination, and fish tissue contamination. The model also uses reasonably anticipated future scenarios for the occurrence of weather related events such as storms and high river flows; those scenarios are based on past conditions, and are assumed to repeat endlessly into the future on a specific cycle or pattern. Of course, this is not actually how the natural environment behaves, but this kind of a model is useful when *comparing* the future anticipated performance of different possible remedial options. That is how EPA used a model to help inform the 2002 remedy selection: the same model, with the same underlying assumptions, was used to evaluate a variety of different remedial options (including doing nothing, carrying out the dredging project that was ultimately selected, and carrying out a far more aggressive or extensive dredging option). EPA did not suggest that the exact results of the model runs would, in fact, be realized when the dredging was actually completed. Nevertheless, EPA assumed in the ROD that the modeling results would approximate the results in nature when viewed over a longer time frame.

The second Five-Year Review report, which EPA issued in 2019, finds that, so far, the remedy appears to be performing in a manner that is not inconsistent with the ROD expectations, and we have no information at this time to suggest that the remedy will not continue to perform as expected. However, as explained in the report, these findings are based on only two years of post-

dredging data, and EPA believes that up to eight or more years of post-dredging data are needed to draw a scientifically reliable conclusion. In the second Five-Year Review report, EPA has therefore deferred a finding about whether the remedy is protective of human health and the environment. (See the answers to Questions 44-49 for further detailed information about the second Five-Year Review report.)

35. In addition to dredging, EPA's remedy relies on the natural recovery of the river. Is this the case with most sites involving rivers or waterbodies?

Yes. Virtually all Superfund sediment cleanup sites pose unique challenges. However, for those sediment sites where contamination is by persistent, bio-accumulative and toxic contaminants like PCBs, remediation often relies partially on natural recovery to reduce contaminant levels and achieve environmental goals. Even where extensive dredging and/or capping of contaminated sediment is selected and carried out, full recovery of the ecosystem - and, specifically, recovery of the fish - is predicted to take decades after the dredging and/or capping is completed.

The EPA's 2002 remedy selection for the Upper Hudson River explicitly relied on two separate elements: first, the very extensive dredging project, covering almost 500 acres and involving removal of approximately 2.7 million cubic yards of PCB-contaminated sediment; and second, natural recovery with extensive monitoring. Natural recovery in the Hudson River primarily occurs as a result of sediment entering the river from upstream and tributaries; sediment movement and burial; and PCBs binding to organic matter. The natural recovery element of the selected remedy is expected to continue for more than five decades before the goals of the remedy are achieved.

36. Does EPA take cost into consideration when choosing a cleanup plan?

Protecting people's health and complying with certain federal and state legal requirements are the main drivers of any cleanup plan. Under the federal Superfund law, the remedy that EPA selects must be protective of human health and the environment. When picking among protective remedial alternatives, EPA must select a remedy that is cost-effective. In addition, when selecting a remedy, EPA is required by the Superfund law and regulations to evaluate remedial alternatives against a number of criteria, including overall protection of human health and the environment; compliance with other legal standards; short- and long-term effectiveness; preference for treatment of hazardous substances; cost; implementability; and state and community acceptance.

37. PCB concentrations in the Upper Hudson River sediment were determined to be higher than EPA first thought when it chose the cleanup remedy. Would EPA have chosen the more aggressive dredging remedy had it known of the higher concentrations?

No. On two occasions prior to EPA's remedy selection, samples of sediment were collected and analyzed for PCBs. These two data sets, from 1991 and 1998, were the basis for the assumptions of EPA (and most other stakeholders) at the time that EPA selected its remedy in 2002. In 2003-2005, under EPA's direction, GE collected many additional sediment samples, which showed that the total mass (kilograms) of PCBs in the sediment - and the surface concentrations - were higher than suggested by the earlier sampling events.

The models that EPA used to evaluate and compare the various cleanup alternatives depend in part on the predicted rate of natural recovery in the surface sediment of the non-dredged parts of the river. The models assume that the sediment in the dredged areas will be nearly clean; the models then assume that the non-dredged areas will improve, year-by-year, at a predicted rate. As the levels of PCBs in sediment decline, the modeling also predicts that the levels of PCBs in fish will improve at a similar rate. Even if sediment PCB concentrations differ from those that were expected through modeling, as long as the anticipated percentage change in concentration in the sediments is achieved, it is expected that the anticipated percentage change in PCB concentrations in fish tissue will also be achieved (probably with a lag or delay of several years). The pre-dredging fish tissue PCB levels have been known with a good degree of certainty dating back to the time of the modeling.

38. Are the dredged areas of the Upper Hudson River being recontaminated?

There is no evidence to suggest that any significant amount of recontamination of previously dredged areas is occurring. EPA, in collaboration with New York State Department of Environmental Conservation (NYSDEC), conducted an extensive analysis of the post-dredging sediment data collected in 2016 and 2017. One part of this evaluation was to examine the PCB concentrations in dredged areas. The results of this evaluation show that the overall median PCB concentration in dredged areas is 0.26 mg/kg Tri-Plus PCBs. Although this value is slightly higher than the initially placed backfill, it was never anticipated that the backfill surface would remain in its original condition. The dynamic nature of the river and natural mixing of sediment along the river bottom has caused some minor recontamination, as was fully expected. Additional details regarding this analysis are included in EPA's Technical Memorandum (Part 1 of 2, Part 2 of 2) that accompanies the second Five-Year Review report.

39. How will EPA measure success for the Upper Hudson River dredging remedy?

EPA's 2002 Record of Decision lays out goals for the cleanup. The primary goals are keyed to reductions in fish tissue PCB concentrations because the main threat to people's health from PCB contamination in the Hudson River is through fish consumption. As PCB levels in fish populations continue to diminish, the risks to ecological receptors will be reduced. EPA's overarching goal was to significantly improve the rate of fish recovery compared to the rate of natural recovery alone (i.e., allowing the river to recover on its own).

Computerized models were used to compare dredging options and estimate how long it would take under each option to achieve the fish recovery goals. The model runs extended for about 55 years after the end of dredging. No dredging alternative – even the most aggressive – was predicted to achieve EPA's goal for fish recovery (0.05 mg/kg of PCBs in fish) within this time period, in the Upper Hudson River as a whole. EPA therefore laid out two interim target concentrations for the cleanup remedy. The first of these (0.4 mg/kg in fish) would allow people to consume one fish meal every two months. The second (0.2 mg/kg) would allow people to consume one fish meal every month.

EPA will measure success for the Upper Hudson River dredging remedy by comparing the goals set in the Record of Decision with data gathered through an extensive program of sediment, water and – perhaps most important – fish monitoring. Fish are collected twice each year, in spring and fall, from

a specified series of locations throughout the Upper and Lower Hudson River. Water quality data are collected weekly or monthly depending on location. Sediment data will be collected every five years.

It will take up to eight or more years of fish tissue data to identify trends with a reasonable degree of scientific certainty. EPA will continue to carry out five-year reviews into the future, which will consider all the new data gathered under the monitoring program since the previous review.

40. How and when will EPA know if the fish are recovering?

GE is required to collect sediment, water, and fish samples on a regular basis. These data are evaluated as they are received. Fish samples are collected twice each year, in spring and fall. All data generated from the analysis are provided to EPA and distributed to the involved state and federal agencies monthly. EPA also provides periodic updates on fish sampling data to the site's Community Advisory Group. Up to eight or more years of post-dredging fish data is likely to be needed to determine a trend with a reasonable degree of scientific certainty. (Dredging ended in late 2015.)

41. What is capping, and what role does it play in remediation of the Hudson?

Capping is a means of isolating hazardous substances, pollutants or contaminants in the river sediment from the "biota" — the plants and animals that might be exposed to those hazardous substances. Capping involves placement of clean material (typically sand) over the contaminated sediment to a specified thickness (e.g., 12", 18" or 24"), possibly with "armoring" by gravel or small rocks to keep the cap material from eroding during high flow events. In some cases, organic carbon is added to the clean sand cap to help contain the contamination. Sometimes a cap will be covered with a habitat layer (e.g., 12" of mixed sand and topsoil), conducive to recolonization of the area by the biota.

In the Hudson River dredging project, it was recognized that full achievement of the dredging specifications would not be possible in all locations. For example, dredging equipment could not get too close to bridge abutments or steep shorelines, or into the nooks and crannies of bedrock on the river bottom. In these areas, if the EPA-specified "residual" (left over) PCB levels identified in the ROD were not achieved through the dredging, then a cap layer would have to be installed. EPA strictly limited the total acreage on which a cap would be constructed. GE's actual work achieved a substantially better outcome than the maximum permissible capping limit set by EPA.

42. Did GE have responsibility to perform dredging in the Champlain Canal navigation channel?

Yes, in certain parts of the navigation channel, but not throughout the entire channel.

There is an authorized Hudson River navigation channel between Fort Edward and Troy. The navigation channel is known as the Champlain Canal, though much of the channel in this 40-mile stretch lies within the main stem of the river. The New York State Canal Corporation is responsible for managing and maintaining the Champlain Canal system including the navigation channel.

In the past the navigation channel was dredged on a regular basis to maintain the authorized minimum depth of 12 feet. Limited maintenance dredging has occurred since the 1970s, when it was acknowledged that PCBs were present in substantial portions of the channel and that dredging of the PCB-laden sediment by the NYS Canal Corporation would have been more difficult and costly. Over the decades, portions of the channel have silted in and became shallower; as a result, it may be too shallow for some fully loaded vessels. Commercial vessels continue to use the Champlain Canal channel, but have to adjust their loads accordingly (being mindful of their vessel draft).

The 2002 EPA ROD specified the criteria for where within the 40-mile stretch of the Upper Hudson dredging would occur. In any place within the navigation channel where those criteria were met, dredging occurred. In those places, to facilitate post-cleanup maintenance dredging by the NYS Canal Corporation, EPA ensured that the remedial dredging was deep enough to either reach a "clean" layer (less than one part per million of PCBs), or that the remedial dredging extended to two feet deeper than the authorized channel depth (i.e., to 14 feet). Thus, when the Canal Corporation resumes maintenance dredging, the material to be dredged in these portions of the channel would either be "clean" or, at a minimum, would have dramatically lower levels of PCB contamination, making management of the dredged materials easier and potentially less costly.

GE removed some 450,000 cubic yards of sediment from the navigation channel as part of the remedial dredging project carried out pursuant to the EPA ROD. However, in parts of the channel where the ROD dredging criteria were not triggered, dredging did not take place. In summary, portions of the Champlain Canal navigation channel throughout the 40-mile stretch of the Upper Hudson River were dredged by GE as part of the EPA project, and other portions were not.

It is EPA's view that the NYS Canal Corporation should now be able to seek appropriate permits for and commence maintenance dredging at any time.

43. What happens if the fish don't recover as predicted?

If the data from the long-term monitoring show that the recovery is not happening as anticipated in the ROD, EPA will determine what, if any, additional steps can be taken to improve the recovery. The Superfund law and the legally binding Consent Decree between EPA and GE include provisions for taking such additional steps.

44. What is a Superfund Five-Year Review?

Under the Superfund law, five-year reviews are required when hazardous substances, pollutants or contaminants remain at a site above levels that would allow for unlimited use and unrestricted exposure. The purpose of the five-year review is to ensure that implemented remedial actions are working as intended and are protective of human health and the environment.

The first five-year review (FYR) for the Hudson River PCBs Superfund site was completed in 2012. The proposed second FYR was published for public comment in 2017 and the second FYR has now been finalized. These two reviews addressed Operable Units (OUs) 1 and 2, the Upper Hudson

Remnant Deposits and the Upper Hudson River sediment, respectively. Further FYRs will be conducted in the future.

45. In the second Five-Year Review report, why is EPA deferring its determination about whether the remedy for the Upper Hudson River sediments is protective?

EPA has deferred making a final protectiveness determination in the second Five-Year Review (FYR) report. These reviews are required by CERCLA when hazardous substances, pollutants or contaminants remain on-site above levels that permit unlimited use and unrestricted exposure. FYRs provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment.

EPA's 2002 remedy selection for the Upper Hudson River explicitly relied on two separate elements: first, the very extensive dredging project, covering almost 500 acres and involving removal of a large volume of PCB-contaminated sediment; and second, natural recovery with extensive monitoring, predicted to take more than five decades.

Virtually all Superfund sediment cleanup sites pose unique challenges. However, for those sediment sites where contamination is by persistent, bioaccumulative and toxic contaminants like PCBs, remediation often relies partially on natural recovery to reduce contaminant levels and achieve environmental goals. Even where extensive dredging and/or capping of contaminated sediment is selected and carried out, full recovery of the ecosystem – and, specifically, recovery of the fish – is typically predicted to take decades after the dredging and/or capping is completed. Natural recovery in the Hudson River primarily occurs as a result of cleaner sediment entering the river from upstream and tributaries; sediment movement and burial; and PCBs binding to organic matter.

In the second FYR report, EPA is deferring a final protectiveness determination because the Agency has determined that there are not yet sufficient years of post-dredging data on which to base such a determination. EPA will need up to eight or more years of post-dredging data before trends can be determined with a sufficient degree of confidence to make projections into the future. (Dredging was completed in late 2015.)

46. Some have asserted that there are "hotspots" in the Upper Hudson River that were not addressed by the dredging. Is this true?

No. During 2018, EPA, in collaboration with New York State Department of Environmental Conservation (NYSDEC), conducted an intensive analysis of post-dredging sediment data collected in 2016 and 2017. Among other objectives of this analysis, EPA undertook to determine whether there were any PCB "hotspots" remaining in the Upper Hudson River. The analysis did not reveal any areas that the agencies believe could appropriately be described as a "hotspot." EPA did identify three relatively small areas as "areas of interest" that will be monitored carefully in the future – for further details about these areas, see the answer to Question 47.

47. What is an "Area of Interest" as discussed in the Second Five-Year Review Report?

As explained in the answer to Question 46, during an intensive review of sediment sampling data carried out in collaboration with New York State Department of Environmental Conservation (NYSDEC) during 2018, EPA undertook to determine whether there were any PCB "hotspots" remaining in the Upper Hudson River. The analysis did not reveal any areas that the agencies believe could appropriately be described as a "hotspot." EPA did identify three relatively small areas where PCB levels were elevated to a statistically significant degree compared with other areas. EPA has classified these as "areas of interest" which will be tracked in the coming years. As additional sampling data is gathered in these areas in the future, EPA will, as appropriate, consider whether any further remediation in these areas is called for.

48. Does a five-year review determine whether the cleanup work at a site is completed?

No. The five-year review process evaluates if the cleanup is performing as expected and is protective of human health and the environment. It does not determine whether site work is completed. When hazardous substances remain on site above levels that permit unrestricted use and unlimited exposure, five-year reviews continue even after work is completed to ensure the remedy remains protective of human health and the environment.

49. How does EPA typically ensure the protectiveness of sites such as this where natural attenuation is a key part of the remedy?

Because the construction work at these sites is completed long before the natural recovery processes have made their essential contributions to the remedy, EPA includes "institutional controls" to protect human health in the interim. Institutional controls are non-engineering instruments such as administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. For sediment sites, institutional controls typically include public education, and advisories and warnings against consumption of fish. As described in the final version of the second Five-Year Review Report, while the river recovery continues, EPA will continue to work with New York State to ensure the ongoing maximum effectiveness of the New York State advisories.

D. Ongoing Fish, Sediment and Water Quality Monitoring

50. How is fish sampling conducted?

Twice a year, in spring and fall, fish are collected at the same locations. In the spring collection, about 350 adult sport fish of various species are collected. In the fall collection, many forage (bottom-feeding) fish and young-of-the-year fish (fish hatched in the same year) are collected. The collection is done using several methods including electroshocking and angling. The adult sport fish are then fileted, and the filet (including the rib bone) is ground and processed for lab analysis to determine PCB levels in the tissue. The forage and young-of-the-year fish are analyzed as whole-body samples.

51. What does EPA look for in fish samples in the Hudson River?

Fish in the Hudson River downstream of the GE plant site at Hudson Falls are dangerous for humans to consume - in other words, people could be exposed to PCBs at levels that pose significant risk to them by eating fish from the river. Other animals including eagles, ospreys, otters and mink, may also be exposed to dangerous levels of PCBs by eating fish. EPA and the New York State Department of Environmental Conservation review the data from samples of several species of fish taken twice each year, in spring and fall, from designated locations in both the Upper and Lower Hudson Rivers. The fish tissue fillet for the sport fish and the whole-body fish for the small forage and young-of-the-year fish are analyzed for PCB content, and the data - like all environmental data gathered as part of the Hudson River PCBs Superfund site project - is made available to the public.

PCB levels in Hudson River fish have been studied in this manner for more than 30 years. Having data over such a long period of time allows EPA to assess whether and how fast the fish recover as part of the natural recovery of the river as well as the significantly improved conditions as a result of cleanup actions.

The New York State Department of Health (NYSDOH) has for decades issued fish advisories, warning against eating fish from the Upper Hudson River, and recommending strict limits on eating fish from the Mid and Lower Hudson River. EPA recognizes that some anglers ignore or are not aware of these advisories and do eat the fish they catch. EPA is working with New York State to continue to improve the outreach efforts to inform anglers about the advisories and the reasons for them.

52. What has EPA found in the fish sampling?

PCB levels in fish from the Upper Hudson River declined appreciably by natural recovery from the time when fish sampling began up to the beginning of dredging. During the dredging, the average PCB levels in Upper Hudson fish increased, as anticipated in the ROD, due to the localized disturbance of sediment from the dredges and vessels. After the dredging ended in late 2015, average PCB levels found in the sport fish collected during 2016 and 2017 returned to pre-dredging levels of about 1.3 mg/kg (parts per million) based on wet weight as a species weighted average for the Upper Hudson River.

It will take up to eight or more years of post-dredging fish tissue data to determine trends with a sufficient degree of scientific certainty. (Dredging ended in late 2015.)

53. How are sediment samples taken?

There are various techniques for taking sediment samples, depending on the specific purpose of the sampling. For example, a major purpose of the sampling done prior to the Record of Decision (ROD) and during the remedial design work was to determine where the PCBs were present and how much "mass" (total weight) of PCBs was in a given location. That information was critical to determine where dredging was needed. For that purpose, samples were collected using a core tube that was driven into the sediment up to eight feet or until refusal (often rock) was encountered. The core tube was then withdrawn with the column of sediment inside. The core tube was then opened lengthwise, and samples removed from different sections for PCB testing. Core tubes were spaced either 80 feet

or 160 feet apart depending on the sampling design. Based on the results of this analysis, an estimate was made of the PCBs present at various depths.

In the post-dredging period starting in 2016, a major purpose of sediment sampling has been to determine the surface sediment concentration - that is, the levels of PCBs in just the top two inches of sediment. This relatively thin surface layer represents a portion of the "bioactive zone," where animals are active and may be exposed to the contaminants in the sediment. A significant amount of biological activity takes place in this surface layer, though some limited activity may go deeper, e.g., to six inches. Surface sediment sampling is carried out using specific equipment designed to collect a precise, shallow sample of sediment. This surface sampling, to be conducted every five years starting in 2016, will allow EPA to determine the rate at which the surface concentrations are declining. The rates of decline in sediment are compared with the rates of decline in fish and water. The ROD defines the rate of fish recovery as the primary measure for rate of recovery in the river. As surface sediment concentrations decline, EPA expects water column concentrations and - importantly - fish tissue concentrations to decline at roughly the same rate.

54. What has EPA found in the post-dredging sediment samples?

The primary goal of the project was to reduce PCB levels in sediment in order to reduce PCB concentrations in river water and fish. Significant amounts of PCBs (310,000 pounds) were removed from Upper Hudson River sediments during the dredging project.

PCB concentrations in surface sediments - the top two inches of sediment - are of particular importance because it is the most active portion of the bioactive zone where organisms are active and are exposed to PCBs, which thereby enter the food chain.

In the 2002 Record of Decision, EPA considered the 40-mile stretch of the Upper Hudson River between Fort Edward and Troy in three "River Sections." River Section 1 (Fort Edward to Thompson Island Dam) is about six miles long; River Section 2 (Thompson Island Dam to Lock 5) is about five miles long; and River Section 3 (Lock 5 to Troy) is about 29 miles long.

Post-dredging samples of Upper Hudson River surface sediments were taken, as follows:

- In 2016, the year following the end of dredging, about 250 surface sediment samples were taken by GE under EPA's direction. These samples were taken in all three River Sections in areas that had not been dredged during the remediation project.
- In 2017 the New York State Department of Environmental Conservation (NYSDEC) collected nearly twelve hundred surface sediment samples, in both dredged and non-dredged areas across all three River Sections.
- Also, in 2017, GE under EPA's direction collected 149 samples in dredged areas of all three River Sections; and an additional 100 samples in non-dredged areas of River Section 3 only.

During 2018 EPA, in collaboration with NYSDEC, conducted an intensive review of these recent sediment data sets.

Among other analyses, EPA compared the recent post-dredging samples with samples taken prior to dredging. Based on samples taken between 2002 and 2005, *prior to the dredging project*, average PCB concentrations in surface sediments were as follows:

- River Section 1 -- about 3.9 parts per million (ppm);
- River Section 2 -- about 7.3 ppm; and
- River Section 3 -- about 3.0 ppm.

Based on the samples taken in 2016 and 2017, *after the completion of the dredging project*, average PCB concentrations in surface sediments were as follows:

- River Section 1 -- about 1.8 ppm (54 percent reduction from the pre-dredging average level);
- River Section 2 -- about 1.3 ppm (82 percent reduction from pre-dredging average level); and
- River Section 3 -- about 0.8 ppm (73 percent reduction from pre-dredging average level).

These reductions in surface sediment concentrations are the result of both the dredging and the natural recovery of the river sediment in non-dredged areas.

At the request of NYSDEC these analyses were also conducted by "River Reach" (or "pools"), to look at sediment and fish samples in the Upper Hudson River that are effectively separated by dams. The intent here was to look at each "Reach" as an isolated ecosphere which could offer potentially different results than those found through aggregating the data by "River Section" because two of the three River Sections include multiple Reaches.

Additionally, individual sediment data points were plotted to look for any potential "hotspots" that might otherwise be lost in averaging results by "River Section" or "River Reach." This analysis did not show areas that EPA would consider "hot spots," but did show "areas of interest," as discussed in the second Five-Year Review report and in the answers to Questions 46-47.

55. How did EPA collaborate with NYSDEC to evaluate the combined post-dredging sediment data sets from 2016 and 2017, and what did that evaluation show?

EPA shared the 2016 sediment data with New York State Department of Environmental Conservation (NYSDEC) and NYSDEC shared its 2017 sediment data with EPA. Throughout 2018, EPA and NYSDEC technical staff and senior leadership met on several occasions to evaluate these data sets and determined that they were consistent and could be combined for the purpose of assessing the post-dredging condition of sediments in the Upper Hudson River, including in both the dredged and the non-dredged areas.

Following is a summary of the results of EPA's engagement with NYSDEC, identifying the key areas of agreement and disagreement, and issues for further discussion:

a. Areas of Agreement

- The collective data sets are usable and GE and NYSDEC data yield similar estimates for sediment PCB concentrations. The data can be combined since sampling and analytical techniques as well as observations are the same or similar.
- The remedy significantly reduced PCB concentrations in dredged areas. There has not been substantial recontamination of dredged areas. It was agreed that EPA would modify the detailed Technical Memorandum describing the assessment of the post-dredging data to better explain why some recontamination of the dredged areas is expected and not of concern. (The Technical Memorandum (Part 1 of 2, Part 2 of 2) accompanies the final second Five-Year Review report.)
- The joint review did not find areas which would be characterized as "hotspots;" it did, however, identify three very localized "areas of interest" where PCB levels are statistically elevated compared with surrounding areas. It is proposed that both agencies track these in greater detail in the future.
- NYSDEC agrees that it cannot yet be determined if more dredging is needed beyond that which was required in the Record of Decision (ROD). They also agreed that if more dredging were to be done, sufficient data is not yet available to determine the scope of that work.
- Sampling and evaluation of sediment data by river reach and river section are both important. (There are eight reaches or "pools" in the Upper Hudson, separated by dams. The ROD focused on three river "sections," two of which include multiple pools or reaches.)
- The ROD focused on "Tri-Plus" PCBs, a subset of Total PCBs. Tri-Plus molecules have three or more chlorine atoms; they present a greater risk than the molecules with one or two chlorine atoms. For the Hudson River project, over 90 percent of PCBs that bioaccumulate in fish are Tri-Plus PCBs. Therefore, both Tri-Plus and Total PCBs are important to consider. EPA's analysis should include both. It was agreed that EPA would present both Total and Tri-Plus maps in its Technical Memorandum.
- Post-dredging fish and sediment data results are inconclusive indicators of remedy "protectiveness" at this time. More monitoring is needed. EPA and NYSDEC will continue to review fish tissue data from semi-annual sampling, and fish will in the future be collected from additional sampling locations beyond those that have been used for many years.

b. Areas of Disagreement

- NYSDEC believes EPA's model predictions overestimate the rates of recovery in sediment; and, further, that EPA is also overly optimistic on rates of recovery of fish. NYSDEC suggests EPA focus on post-dredging data and ensure that EPA collect enough data as

quickly as reasonably possible, to determine if the recovery is meeting the ROD fish recovery objectives (fish targets).

c. Areas that Require Follow-up or Further Discussion

- EPA and NYSDEC will undertake to jointly define "areas of interest."
- NYSDEC asked to be included in development of the scope of work for the next surface sediment data sampling round (scheduled for 2021). This would include a scope of work to determine the impacts of recent sediment deposition.

56. What levels of PCBs are of concern in river surface sediment samples?

EPA has not established a specific target level of PCBs in surface sediment (the top two inches of sediment) for the Upper Hudson River. Rather, EPA has established interim and long-term targets for PCB concentrations in fish (see answer to Question 7).

The primary reason for concern about the levels of PCBs in surface sediment is that these PCBs can enter the food chain (as described in the answer to Question 3). The primary goal of the remedy is that sediment PCB levels are reduced sufficiently, over time, so that PCBs in fish are reduced to levels that do not pose unacceptable risks to humans and other animals when those fish are eaten. As average surface sediment concentrations of PCBs are reduced (by dredging and natural attenuation; see the answer to Question 30 for an explanation of "natural attenuation"), the levels of PCBs in the food chain are expected to decline in a roughly similar time frame and on a roughly similar trajectory. Therefore, the specific level of PCBs in the sediment is of less concern than the *rate of decline* in the average surface sediment PCB concentrations. This is because as the level of sediment contamination decreases, the level of fish contamination is expected to decrease at a generally similar rate (though probably with a delay or "lag time" of several years).

On average, since dredging was completed, Tri-Plus PCBs in river surface sediment have been reduced to 1-2 parts per million from their pre-dredging highs (see Question 54).

By definition, an "average concentration" for a given segment of the river will include areas where PCB sediment levels are higher than the average and areas where they are lower than the average. A significant amount of PCB contaminated sediment was removed by the dredging. Where dredging was done, clean sand was placed on the river bottom. PCB concentrations in these dredged areas will typically be lower than the average concentration for a larger segment of the river that includes both dredged and non-dredged areas.

In general, in the non-dredged areas surface sediment concentrations are likely to be higher than in the dredged areas. In a small number of locations, EPA identified "areas of interest" where concentrations are higher than in the surrounding area (see answers to Questions 46-47). EPA will closely monitor these in the future in coordination with New York State Department of Environmental Conservation (NYSDEC).

PCBs in the surface sediments of non-dredged areas are expected to continue to decline by natural recovery (also called natural attenuation) processes. PCB concentrations in water also are expected to continue to decline and are currently well below the federal drinking water standard for PCBs.

In summary, while EPA has not established a specific target level of PCBs in sediment for the Upper Hudson River, EPA has established interim and long-term target concentrations for PCB concentrations in fish. EPA will continue to carefully monitor both surface sediment and fish tissue concentrations of PCBs in order to assess whether the rate of decline in both is generally consistent with the predictions in EPA's 2002 Record of Decision.

57. What is the purpose of EPA's evaluation of samples taken by the New York State Department of Environmental Conservation in 2017?

In close coordination with the State of New York, EPA evaluated the results from nearly 1,200 sediment samples collected in 2017 by the New York State Department of Environmental Conservation (NYSDEC) from the Upper Hudson River to ensure that EPA's assessment of the river is as thorough as possible. The purpose of the recent EPA and state sampling efforts was to better understand current surface sediment concentrations and continue to monitor long-term recovery of river bottom sediment. The results of this analysis are provided in a Technical Memorandum (Part 1 of 2, Part 2 of 2) that accompanies the second Five-Year Review report. The 2016/2017 sample collection efforts were the initial post-dredging sampling events in this long-term sampling program.

E. Status of Upper Hudson River Floodplain Investigation

58. What is EPA doing to address PCB-contaminated soil in the floodplain, including abandoned Champlain Canal segments?

Once PCBs entered the river, they were mixed with water, sediment and wood debris. During flooding, contaminated sediment and wood debris from the river were deposited in some areas in the floodplain (low-lying shoreline areas, including abandoned Champlain Canal segments; see answer to Question 63 for further detail about these segments).

In October 2014, GE agreed to conduct a comprehensive study of PCB contamination in the floodplain (called a Remedial Investigation and Feasibility Study or RI/FS). This study includes an evaluation of human and ecological risks and potential long-term clean up solutions. The study area includes both sides of a 43-mile stretch of the Upper Hudson between Hudson Falls and Troy, NY and includes over 3,000 separate properties.

The RI/FS includes extensive sampling of floodplain soil and abandoned Champlain Canal segment bottom sediment (see answer to Question 63). If any areas presenting an immediate risk are identified during this study, GE carries out an appropriate interim response action, subject to EPA direction, which include soil covers and signage.

When the RI/FS is completed, EPA will issue a proposed cleanup plan for public review and comment. After considering all comments, EPA will make a remedy selection decision for the floodplain. EPA expects that GE will perform the work to accomplish any remedy selected by EPA for the floodplain.

59. What will EPA do if elevated levels of PCBs are found in soil on people's properties, or in the abandoned Champlain Canal segments (see Question 63)?

Under EPA supervision, GE is taking thousands of samples of soil in the Upper Hudson River floodplain (the stretch from Hudson Falls to Troy) as part of the Remedial Investigation and Feasibility Study (RI/FS). Whenever immediate risks are identified, they are promptly addressed through appropriate interim response actions. Upon completion of the RI/FS, EPA will make a remedy selection decision for the floodplain. This may include removal and/or capping of contaminated soil. EPA will look to GE to implement any remedy selected by the Agency for the floodplain.

60. When the river floods, it deposits mud on my property. Is the mud contaminated with PCBs?

GE, under EPA supervision, collects samples of mud that accumulates after flooding of properties throughout the Upper Hudson River. The mud typically has no or low levels of PCBs. This monitoring is expected to continue for the foreseeable future, and the results will be considered as part of the comprehensive investigation of the floodplain.

61. Will EPA require excavation of PCB-contaminated soil as part of its floodplain work?

EPA has not yet proposed a remedy selection decision for the Upper Hudson River floodplain. The Remedial Investigation and Feasibility Study (RI/FS) that will inform that plan is now being carried out by GE under EPA supervision. When that RI/FS is completed, EPA will publish a proposed decision for public review and comment; and after considering all comments, EPA will make a final remedy selection decision. In the meantime, when sampling discloses any area of immediate concern, that area is promptly addressed.

62. What is EPA doing to address the Champlain Canal navigation channel and other canal sections?

In various locations in the Upper Hudson River, the Champlain Canal navigational channel runs through the main stem of the river. It has been many years since maintenance dredging was carried out in the majority of the canal to ensure that the authorized navigational depth is available throughout the channel. The New York State Canal Corporation (NYSCC) is responsible for maintaining the channel, including any necessary maintenance dredging.

Maintenance of authorized navigational depths is not the responsibility of the federal Superfund program. However, in many parts of the Champlain Canal channel, the criteria established in the 2002 Superfund Record of Decision for areas to be dredged were in fact met, and this resulted in the removal of a great deal of PCB-contaminated sediment from the navigational channel. An estimated 450,000 cubic yards of contaminated sediment were removed from the channel during the Superfund dredging project.

63. Will there be dredging of abandoned segments of the Old Champlain Canal?

The Old Champlain Canal (OCC) is a stretch of canal that in certain places runs parallel to the main stem of the Hudson River. It was used in the past by ships and barges to bypass difficult portions of the main stem, but it has not been used for that purpose for many years, and so has not been maintained. Much of the OCC has filled in with sediment, some of which may have PCB contamination.

It is possible that excavation may be called for in some parts of the OCC, but a final decision has not yet been made. The OCC is currently being evaluated as part of EPA's ongoing investigation of the Upper Hudson River floodplain. If at any time PCBs are detected at elevated levels that are a potential health concern, a short-term response action will be taken promptly.

The OCC was never a component of the Upper Hudson River dredging project. Instead, it has always been a component of the floodplain project and is being assessed in Schuylerville and other Upper Hudson communities. The volume of water that flows from the main river through the OCC is typically quite limited, as the OCC is not connected to the main river for navigation. Over time, the OCC has filled with sediment from connected drainage ditches and culverts. Some stretches of the OCC have been completely filled in with soil from construction as areas were developed. For these reasons EPA designated it to be part of the floodplain and not the Upper Hudson River sediment dredging project.

64. When does EPA plan to have a final cleanup plan for the floodplain and abandoned segments of the Old Champlain Canal?

The Remedial Investigation/Feasibility Study (RI/FS) of the Upper Hudson River floodplain is a multi-phased process that will take several more years to complete. The data collected from the ongoing sampling will be used to evaluate the risk of exposure to PCBs to both humans and biota (plants and animals). These risk assessments will be used to support the evaluation of cleanup approaches to address contamination in the floodplain.

Prior to the completion of the multi-year study, actions will be taken as necessary to address exposures related to PCB contamination. After the RI/FS is completed and public input is sought, EPA will make a remedy selection decision.

65. Have PCBs been found on agricultural land?

As part of the floodplain studies, soil samples have been collected on agricultural land. Generally, PCBs have either not been detected or have been detected at low levels. Not all agricultural land in the Upper Hudson River floodplain has been sampled, but additional sampling is planned as part of the ongoing comprehensive investigation of the floodplain.

66. Is it safe to use Hudson River water for watering lawns or gardens?

Yes, PCB levels in river water are below the federal drinking water standard. EPA and the New York State Department of Health recommend that people take precautions to not inadvertently drink untreated water from the river because it may contain harmful organisms or contaminants.

Gardening and eating homegrown vegetables are not major sources of PCB exposure. As a precaution, homegrown vegetables should be thoroughly washed and/or peeled prior to eating. This will help remove soil that adheres to the vegetables.

67. Is it safe to have a vegetable garden in the floodplain?

Gardening and eating homegrown vegetables are not major sources of PCB exposure. This is because PCBs are typically found in low-lying areas next to the river, which are usually not good for residential gardening due to frequent flooding. EPA and the New York State Department of Health recommend that people take the following precaution: should you choose to garden in a low-lying area next to the river, be sure to thoroughly wash and/or peel vegetables grown there. This will help remove soil that adheres to the vegetables.

68. What precautions should I take because there may be PCBs on my property in the Hudson River floodplain?

Considering that PCBs could be present at any given location in the floodplain, residents should take simple precautions to minimize potential exposures when spending time in floodplain areas. The best way people can reduce their exposure to PCBs is to be aware that PCBs may exist in soil in frequently flooded areas near the riverbank's edge and to take simple precautions when using these areas. EPA and the New York State Department of Health recommend that people take the following precautions:

- Children may come into direct contact with PCB-contaminated soil while playing or digging in the floodplain soil. To reduce potential exposures, children's hands, feet and toys should be washed after playing or digging in the dirt, especially before eating. Avoid tracking soil and mud from potentially contaminated areas into your home by rinsing off shoes that may have sediment or soil on them. Additionally, wipe your pet's feet before it enters your home.
- Avoid digging in and relocating soil from the areas where frequent flooding occurs.
- Wash soil from skin whenever possible, especially after working in areas where flooding occurs. To further reduce exposures, minimize skin contact working in soil by wearing clothing such as gloves, shoes, and long pants to minimize soil contact.
- Gardening and eating homegrown vegetables are not major sources of PCB exposure for most people. This is because PCBs are generally found in low-lying areas next to the river, which are usually not good for residential gardening due to frequent flooding. Should you choose to garden in a low-lying area next to the river, be sure to thoroughly wash and/or peel vegetables grown there. This will help remove soil that adheres to the vegetables. (See also the answers to Questions 66-67)

69. Can I be compensated due to the presence of PCBs on my property in the Upper Hudson River floodplain?

Actions that have or will be taken to address PCB contamination in the Hudson River are being performed under the federal Superfund law, which is more formally known as the Comprehensive

Environmental Response, Compensation, and Liability Act, or "CERCLA." CERCLA does not provide EPA with the legal authority to compensate residents or communities.

However, the costs associated with any actions that are taken under the Superfund program to address PCBs on an individual property will not be borne by the property owner. Rather, GE is expected to pay for such cleanups. (Property owners who believe they have suffered damage may wish to consult with an attorney to determine whether they may be able to assert a legal claim.)

F. Assessing the Lower Hudson

70. What work is being done to address PCB contamination in the Lower Hudson River, downstream of Troy?

The Hudson River PCBs Superfund site includes the 200-mile stretch from Hudson Falls to the southern tip of Manhattan in New York City. EPA's 2002 Record of Decision addressed the sediments in the 40-mile stretch of the Upper Hudson River between Fort Edward and Troy.

EPA is initiating collection of additional data and information in the Lower Hudson River, from Troy to the southern tip of Manhattan in New York City. These studies will supplement information collected during EPA's investigation of the Lower Hudson River in the 1990s, the periodic monitoring of Lower Hudson River fish and water by GE under EPA oversight since 2004, and the periodic monitoring of Lower Hudson River fish by New York State. The purpose of the new assessment will be to determine whether additional study and/or cleanup is necessary in this portion of the river. The new assessment will be done in collaboration with the New York State Department of Environmental Conservation.

GE remains legally responsible for its PCBs that migrated to this area, and other parties also may be liable for PCBs in the Lower Hudson. Water and fish sampling in the Lower River have been conducted for many years and will continue as part of GE's Operation, Maintenance and Monitoring obligations under the 2006 Consent Decree.

71. When EPA begins its study of the Lower Hudson, will it just look for PCBs?

PCBs will be the main focus of the data collection in the Lower Hudson River, but EPA will look for other contaminants as well. Particularly near New York City, there are a number of other contaminants of concern, including dioxin, mercury, and polycyclic aromatic hydrocarbons, from a wide variety of sources.

72. How will EPA determine if others are contributing PCBs to the contamination of river?

Different sources of PCBs have different types and/or different mixtures of the components that make up PCBs, potentially creating an identifiable "signature" for each of those sources. If PCBs matching that signature are found in particular areas, that can be strongly indicative of the source. EPA is aware of some other sources of PCBs in the Lower River.

73. Will EPA require dredging in the Lower Hudson River?

EPA has announced that it will carry out supplemental studies of the Lower Hudson River, from Troy south to the New York City Harbor. These studies will supplement information collected during the Reassessment process in the 1990s that led to the 2002 Record of Decision, along with the results of periodic monitoring of Lower Hudson River fish and water by GE under EPA oversight since 2004, and periodic monitoring of Lower Hudson River fish by New York State. The supplemental studies will also help inform the need for a remedial investigation and feasibility study. It is too early in the process to determine if a cleanup is needed in the Lower Hudson River. PCB removal by dredging in the Upper Hudson River has reduced PCB transport to the Lower River. This beneficial reduction, along with continued natural recovery, is expected to continue to reduce PCBs in the Lower River. GE remains legally responsible for PCBs that migrated to this area from its plants in Fort Edward and Hudson Falls; other potentially responsible parties may be identified as well.

74. When will EPA make its decisions about cleanup work needed in the Lower Hudson River?

EPA expects that the supplemental studies of the Lower Hudson River will start in 2019 and will take several years to complete. If EPA concludes that a Remedial Investigation and Feasibility Study (RI/FS) is necessary, EPA expects to ensure that it is initiated promptly thereafter. Such an RI/FS would likely be extensive and complex and could take a number of years. Based on the RI/FS, EPA would decide whether remedial work is called for; such a decision would be made after an opportunity for public review and comment. This decision process would take about 12 to 18 months. If the decision is to require cleanup work, EPA would then look to the potentially responsible parties to perform that work.

G. Role of Natural Resource Trustees

75. What are Natural Resource Trustees and what is their role in Superfund cleanups?

The President designates certain executive officers as federal trustees for natural resources. They include the secretaries of the Departments of Interior, Commerce, Defense, Energy and Agriculture. In addition, Superfund expects the governor of each state to designate state natural resource trustees. Indian nations are also trustees for their natural resources.

Trustees often have information and technical expertise about the biological effects of hazardous substances, as well as the location of sensitive species and habitats that can assist EPA in characterizing the nature and extent of site-related contamination and impacts. Coordination at the investigation and planning stages also provides the Trustees early access to information they need to assess injury to natural resources.

76. Who are the Trustees for the Hudson River PCBs Superfund Site?

For the Hudson River, the Trustees are the following agencies or entities: the New York State Department of Environmental Conservation; the U.S. Department of Commerce, through the National Oceanic and Atmospheric Administration (NOAA); and the U.S. Department of the Interior, through the U.S. Fish and Wildlife Service (FWS).

77. What is the difference between the work that EPA does under Superfund and the actions taken by the Hudson River Natural Resource Trustees?

Under the Superfund law, EPA is charged with the responsibility of carrying out "response" actions to address threats to human health and the environment from the actual or threatened release of hazardous substances into the environment. The dredging work EPA selected in 2002 for the Upper Hudson River was this kind of response action, as are the ongoing floodplain work and the planned supplemental studies of the Lower Hudson River.

The Superfund law recognizes that the hazardous substances at a Superfund site may cause damages to natural resources, including damages that may remain after an EPA response action is completed. It is the responsibility of the Hudson River Natural Resource Trustees to assess those damages. The Trustees are currently conducting a Natural Resource Damage Assessment (NRDA).

The Hudson River Natural Resource Trustees have not yet filed a natural resource damage claim.