



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
SOLID WASTE AND  
EMERGENCY RESPONSE

July 9, 2015

MEMORANDUM

SUBJECT: CSTAG Recommendations on the Newtown Creek Contaminated Sediment Superfund Site

FROM: Stephen J. Ells, Chair   
Contaminated Sediments Technical Advisory Group

TO: Caroline Kwan, Remedial Project Manager  
Region 2

**Background**

OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (February 12, 2002), established the Contaminated Sediments Technical Advisory Group (CSTAG) to "monitor the progress of and provide advice regarding a small number of large, complex, or controversial contaminated sediment Superfund sites." One purpose of the CSTAG is to guide site project managers to appropriately manage their sites throughout the Superfund process in accordance with the 11 risk management principles described in the OSWER Directive and with the recommendations in the 2005 *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*. CSTAG membership consists of eight regional representatives, two from the Office of Research and Development, two from the U.S. Army Corps of Engineers' Engineer Research Development Center, and three from the Office of Superfund Remediation and Technology Innovation. The CSTAG visited Newtown Creek and met with the EPA project team on May 19 and 20, 2015. Several stakeholders also made presentations to the CSTAG, including the Newtown Creek Group (NCG), New York City Department of Environmental Protection (NYCDEP), the New York State Department of Environmental Conservation (NYSDEC), the Community Advisory Group, and the National Oceanic and Atmospheric Administration (NOAA), on behalf of itself and the U.S. Fish and Wildlife Service.

## Site Description

Newtown Creek (The Creek) is 3.8 miles long and includes five short tributaries. It forms part of the boundary between Brooklyn and Queens in New York City. Except for the wider turning basin, the typical width is 200 to 300 feet and the waterbody has a tidal range of four to six feet. Almost all of the shoreline is bulk-headed or rip-rapped.

Since the 1800s, the Newtown Creek Superfund Site (Site) has been industrially developed. Industrial wastes were typically discharged directly to Newtown Creek and its tributaries without treatment in the early twentieth century, and spills and releases of various contaminants on upland properties seeped into Newtown Creek and its tributaries. The second largest oil spill in United States history, first discovered in the late 1970s, occurred immediately upland of Newtown Creek and is believed to have leaked between 17 and 30 million gallons of oil and petroleum products over more than 50 years. In addition, New York City (NYC) began dumping raw sewage directly into the Creek in 1856 and continued into the twentieth century. Several state-sponsored cleanups have taken place at properties in the upland areas of the Site.

In September 2010, Newtown Creek was listed on the National Priorities List. In July 2011, EPA signed an administrative order on consent (AOC) for the remedial investigation (RI) and feasibility study (FS) of the sediments and waters of Newtown Creek and its tributaries (defined in the AOC as the “Study Area”) with six potentially responsible parties. The respondents to the AOC are NYC and five individual members of the NCG: ExxonMobil, Phelps Dodge, Texaco, BP, and National Grid. The NCG is conducting the RI activities under EPA oversight, and NYC, as a significant respondent, is afforded the opportunity to review and comment on draft deliverables and documents and to participate in meetings between EPA and the NCG.

The RI/FS is being conducted in phases. The Phase 1 RI field investigation began in February 2012 and was completed in March 2013. The Phase 2 RI field investigation intends to (1) collect information to address Phase 1 data gaps, (2) refine the contaminant fate and transport evaluation, and (3) assess risks to human health and the environment. Phase 2 began in May 2014 and is expected to be completed in September 2015.

The primary contaminants of potential concern (COPCs) identified during Phase 1 include polychlorinated biphenyls (PCBs), polycyclic hydrocarbons (PAHs) and metals. These contaminants were found in surface sediments, subsurface sediments, and in the water column. Contaminant concentrations are generally higher in the Turning Basin, English Kills and Dutch Kills, and lower in other portions of the main channel of Newtown Creek, especially near the mouth. The results of the Phase 1 RI indicated the following concentration ranges of contaminants in the surface sediment (top 15 centimeters): 0.12 to 22 mg/kg of PCB congeners; 9.5 to 780 mg/kg of PAHs; 94 to 3,100mg/kg of lead; and 91 to 23,000 mg/kg of copper. The Phase 1 RI indicated the following concentration ranges of contaminants in subsurface sediment, representing the riverine sediments (15 cm to depth of native sediments) and the native sediments: 0.058 to 170 mg/kg of PCB congeners; 11 to 15,000, mg/kg of PAHs; 1.5 to 3,200 (J) mg/kg of lead; and 3.6 to 28,000 mg/kg of copper. The Phase 1 RI indicated the following concentration ranges of key contaminants in surface water: 0.46 to 91 ng/L of PCB congeners; 1.3 to 1,200 ng/L of PAHs; 0.5 to 16 µg/L of lead; and 1 (J) to 90 µg/L of copper.

## **Recommendations**

### Principle 1 - Control Sources Early

1 - CSTAG recommends that Region 2 identify all piped conveyances and estimate their contributions to contaminant loading and any potential risk. CSTAG is concerned about potential recontamination following any remedial action that is undertaken before sources are adequately controlled. The Region should also evaluate if loadings from CSOs may increase because of new planned residential developments. CSTAG recommends that the Region work with the appropriate regulatory authorities to develop a plan to eliminate any unpermitted, piped discharges, minimize impacts from CSOs, and address groundwater discharges that may re-contaminate the Creek.

### Principle 2 - Involve the Community Early and Often

2 - CSTAG recommends that Region 2 continue its efforts to ensure meaningful community involvement and to consider additional opportunities to make the investigation and any potential cleanup more transparent to the affected communities. The Region should also evaluate whether outreach materials should be developed in additional languages such as Spanish and Polish.

### Principle 3 - Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees

3 - CSTAG understands that the State is primarily responsible for evaluating and controlling upland sources to the Creek, and EPA is responsible for all in-water investigations and cleanup. This separation makes it challenging for EPA to fully evaluate and understand the relationship between contaminated groundwater discharges and the sediment contamination in the Creek. As recommended in the recent EPA memo, *Promoting Water, Superfund and Enforcement Collaboration on Contaminated Sediments*, Region 2 should increase its coordination with the State's Clean Water Act program to enhance collaboration on restoring this waterbody.

As discussed in *A Primer for Remedial Project Managers on Water Quality Standards and the Regulation of Combined Sewage Overflows under the Clean Water Act* (OSWER Directive 9200.1-116-FS), the CSTAG recommends that Region 2 encourage the State to consider the following recommendations included in the above Directive: 1) review and revise the Water Quality Standards for the Creek and develop additional decreases in allowable discharges, 2) require NPDES permittees to monitor their discharges for contaminants such as copper, PAHs, and PCBs, and 3) for any outfalls discharging a potentially significant load of hazardous substances, issue a new NPDES permit with stricter controls.<sup>1</sup>

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<sup>1</sup> Promoting Water, Superfund, and Enforcement Collaboration on Contaminated Sediments. February 12, 2015. <http://water.epa.gov/scitech/swguidance/standards/library/upload/promoting-water-sediments-memo.pdf>  
Sediment Assessment and Monitoring Sheet #4: A Primer for Remedial Project Managers on Water Quality Standards and the Regulation of Combined Sewage Overflows under the Clean Water Act. December 2013. OSWER Directive 9200.1-116-FS. [http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/CWA\\_Primer\\_Final\\_-\\_SAMS\\_4\\_-\\_Dec\\_10\\_2013\\_\\_508.pdf](http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/CWA_Primer_Final_-_SAMS_4_-_Dec_10_2013__508.pdf)

#### Principle 4 - Develop and Refine a Conceptual Site Model that Considers Sediment Stability

4 - CSTAG recommends that Region 2 refine the conceptual site model to more accurately quantify the relative significance of erosional shorelines, groundwater, and leaking bulkheads as contaminant sources to the Creek.

The modeling system under development by Anchor QEA (AQ) on behalf of the Newtown Creek Group appears comprehensive. While CSTAG would not *a priori* recommend that such a complex modeling system be used for remedy selection at the Site, Region 2 is currently reviewing AQ's modeling system to determine if the model outputs may be useful in refining the CSM. The Region is also considering whether a less sophisticated model may be more appropriate. However, CSTAG questions why such a complex modeling system is under development for a site at this stage in the process, where neither unacceptable ecological or human health risks have yet been determined, and it has not been established how the model could be used to evaluate remedial alternatives. It is essential that the administrative record include a description of how any models used in remedy selection were reviewed, calibrated, validated, and how the uncertainties in model predictions were considered.

5 - The Newtown Creek estuarine system was described as net depositional, but the CSTAG noted that the Creek has maintained navigational depths without maintenance dredging since the 1940s. CSTAG recommends that the net deposition rate be more accurately quantified, including its spatial variability throughout the Site. Region 2 should use multiple lines of evidence, such as repeat bathymetric surveys and geochronological and stratigraphic analyses of the sediment bed to support this analysis.

#### Principle 5 - Use an Iterative Approach in a Risk-Based Framework

6 – If the Region's evaluation of Phase 2 data shows that unacceptable risks are likely, the Region should consider using removal actions in order to more quickly remediate the non-aqueous phase liquid (NAPL) sources near the manufactured gas plants, upland source areas not addressed by the State, and discrete hot spots of COPCs in the sediment bed that present clearly unacceptable risks.

7 - As part of the baseline ecological risk assessment, CSTAG recommends that Region 2 develop a decision process that describes how they intend to use the multiple lines of evidence (e.g., benthic toxicity, COPC concentrations compared to benchmarks, species diversity index) to make ecological risk decisions. It is often difficult to obtain dose-response relationships from standard sediment toxicity studies as toxicity often is not correlated with bulk sediment concentrations of COPCs. For PAH toxicity, the Region should consider using passive sampling devices to directly measure the dissolved PAH concentration in sediment porewater and then deriving toxic units as outlined in EPA's "Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures" (EPA-600-R-02-013).

8 - CSTAG recommends that the Region 2 project team develop a data management plan for the Region to receive, store, and manage data. One expected advantage of developing and working

such a plan is that it will be easier to access and use the data for technical analysis and to facilitate more rapid responses to queries from other audiences such as the public.

9 - CSTAG recommends that Region 2 consider reviewing the CSO data collected by NYCDEP to assist in assessing loadings to the Creek from the major CSOs at the ends of Maspeth Creek, Dutch Kills, English Kills, Whale Creek, and the East Branch. One challenge is that the NYCDEP data exist and are collected outside of the EPA RI/FS and the quality assurance project plan. Therefore, the CSTAG recommends that Region 2 develop a plan for evaluating information that was not generated under an EPA-approved workplan, yet might be useful for site characterization.

#### Principle 6 - Carefully Evaluate the Assumptions and Uncertainties Associated with Site Characterization Data and Site Models

10 - The determination of background concentrations for primary contaminants of concern is an important consideration for remedy selection at many sites. The CSTAG recommends that Region 2 evaluate whether the current RI sampling and modeling will be sufficient to support a background determination, and if it is not sufficient, determine what additional actions are necessary to define background. If the screening risk assessments clearly indicate unacceptable human health or ecological risks from PAHs, the CSTAG recommends that Region 2 evaluate the background study done by the NYSDEC to assess the recommendation that 71 ppm PAHs in sediment is an appropriate background concentration.

11 - The CSTAG was surprised that no fish tissue contaminant data, although collected in summer 2014, were available for the CSTAG meeting, given the likely significance of these data, the presence of PCB contamination at the Site and the human health effects usually associated with the consumption of PCB-contaminated fish. The CSTAG understands that biota have been sampled and recommends that at least two sets of biota tissue from different years be collected and evaluated to reliably evaluate risks prior to making remedy decisions.

#### Principle 7 - Select Site-specific, Project-specific, and Sediment-specific Risk Management Approaches that will Achieve Risk-based Goals

12 - CSTAG recommends that Region 2 consider whether it is appropriate to divide the study area into smaller decision units in order to refine site characterization and remedy evaluation (e.g., tributaries to the creek, the confluence with the East River, the turning basin). This approach may be beneficial should decision units exhibit different risk levels or site characteristics that may warrant a different remedy or combination of remedies.

13 - Region 2 should consider whether bulkhead upgrades are necessary as part of any remedy and work with property owners to ensure such upgrades are completed.

14 - CSTAG recommends that ebullition be further evaluated as a potential significant transport mechanism for hydrophobic contaminants present as NAPL. It is important to determine where the coal tar/NAPL is located within the study area (i.e., behind the bulkhead, under the sediments, upland pools), what phase it is in, the location of any pressure gradients, and how it is

entering the Creek and its tributaries. Understanding how the coal tar is entering the Creek will be critically important for evaluating effective remedies in the FS to contain, treat, or remove it. CSTAG recommends that Region 2 identify where the mobile fraction of coal tar is located in the subsurface. Technologies that can evaluate the mobile fraction of coal tar have been found to be useful at some sites and should be considered.

Principle 11 - Monitor During and After Sediment Remediation to Assess and Document Remedy Effectiveness

15 - The CSTAG recommends that Region 2 determine if sampling conducted during the RI will provide adequate baseline data to assess whether the RAOs will be achieved after remediation. Although CSTAG understands that the concept of building a baseline was incorporated into the planning process leading up to the approved RI work plan, it is important to evaluate the adequacy of the baseline data if remediation is required. Ideally, results from several sampling episodes over several years should be available. This is especially important for fish sampling where it is common to have highly variable data.

**Regional Response**

Please provide a response to me for each recommendation within 90 days. If you need a clarification on any recommendation, please give me a call at 703 603-8822.

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