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

OFFICE OF
LAND AND EMERGENCY
MANAGEMENT

April 9, 2024

MEMORANDUM

SUBJECT: CSTAG Recommendations on Proposed Early Action, East Branch Newtown Creek, Newtown Creek Superfund Site, New York, New York. Milestone 4.

FROM: Karl Gustavson, Chair, on behalf of the Contaminated Sediments Technical Advisory Group (CSTAG), Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency (EPA).

TO: Caroline Kwan, Mark Schmidt, and Rupika Ketu, and Taylor Hard, Remedial Project Managers, Superfund and Emergency Management Division, EPA Region 2.

BACKGROUND

OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (February 12, 2002)[1], 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," which are known as “Tier 2” sites. CSTAG members are site managers, scientists, and engineers from EPA and the U.S. Army Corps of Engineers with expertise in Superfund sediment site characterization, remediation, and decision-making. One purpose of 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 2002 OSWER Directive, the 2005 *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (EPA-540-R-05-012)[2], and the 2017 OLEM Directive on Remediating Contaminated Sediments (OLEM Directive 9200.1-130).[3] The Newtown Creek site is a Tier 2 CSTAG site, and the contaminated sediment actions are subject to CSTAG review per CSTAG’s policies and procedures.[4]

This CSTAG review considers milestone 4 (near completion of the draft proposed plan) for an early action in the East Branch of Newtown Creek. The milestone 3 review was held in July 2023 and previous CSTAG meetings on Newtown Creek were held in 2020 (on Operable Unit [OU] 3, a proposed early action) and 2015 (an initial site meeting). CSTAG’s written recommendations and the Region’s responses

[1] Available at: https://semspub.epa.gov/src/document/HQ/174512
[2] Available at: https://semspub.epa.gov/src/document/HQ/174471
[3] Available at: https://semspub.epa.gov/src/document/11/196834
[4] Available at: https://semspub.epa.gov/work/HQ/100003253.pdf

are available at the CSTAG website.[5] The Region has also provided CSTAG with informational updates on site progress and decisions throughout the Tier 2 consultation process.

BRIEF DESCRIPTION OF THE SITE

Newtown Creek is 3.8 miles long and includes five short tributaries, including the East Branch. 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 five to six feet. Much of the shoreline is bulk-headed or rip-rapped.

Since the 1800s, the Newtown Creek has been industrially developed. Industrial wastes were typically discharged directly to Newtown Creek and its tributaries without treatment in the nineteenth century and early to mid-twentieth century, and spills and releases of various contaminants on upland properties seeped into Newtown Creek and its tributaries. One of the largest oil spills in the United States was discovered in the 1970s 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. Several state-sponsored cleanups have taken place and/or are underway 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 with six potentially responsible parties (PRPs). The respondents to the AOC are NYC and five individual members of the Newtown Creek Group (NCG): ExxonMobil, Phelps Dodge, Texaco, BP, and National Grid. The NCG is conducting the RI/FS activities under EPA oversight. USEPA has approved the baseline human health risk assessment (2017), the baseline ecological risk assessment (2018), and the remedial investigation report (2023).

The primary contaminants of concern (COCs) are polychlorinated biphenyls (PCBs), hydrocarbons (total polycyclic aromatic hydrocarbons [PAHs] and C19-C36 aliphatic hydrocarbons), metals (lead and copper), and dioxins/furans. These contaminants are found in surface sediments, subsurface sediments, porewater, the water column, biota tissue, and underlying groundwater. In-creek processes affecting contaminant fate and transport include sediment resuspension, propwash, NAPL (non-aqueous phase liquid) migration and dissolution, gas ebullition, and groundwater discharge. Mixing of newly deposited sediment with existing sediment is variable throughout the creek and is influenced by these in-creek processes. Ongoing external inputs to the creek include tidal flows from the East River, point source discharges, overland stormwater flow, and other sources. Contaminant concentrations in sediment are generally higher in the Turning Basin and the tributaries, and lower in the main channel of Newtown Creek, especially near the mouth. The baseline human health risk assessment found unacceptable risks associated with ingestion of fish and crab from the creek. The baseline ecological risk assessment found that the study area sediment, particularly in the Turning Basin and most of the tributaries, is toxic to benthic invertebrates and presents exposure risks for bivalves, blue crabs, fish, and birds.

OU1 includes the entire study area as defined in the 2011 AOC. OU2 relates to current and reasonably anticipated future releases of CERCLA hazardous substances from combined sewer overflow (CSO) discharges to the study area. The East Branch interim early action is part of the OU1 study area.

[5] https://www.epa.gov/superfund/large-sediment-sites-tiers-1-2

SITE REVIEW

The site review was held February 13-14, 2024. The EPA Region 2 project team submitted a site information package to CSTAG that included a milestone 4 consultation memo describing how the eleven principles and sediment guidances were considered, an overview of Newtown Creek site actions, a remedial action objective (RAO) and preliminary remediation goal (PRG) development framework, and a review of how CSTAG's September 2023 recommendations were incorporated into the current materials. At the time of the meeting, a proposed plan was not yet prepared, however, the preferred alternative was presented to CSTAG, along with the nine National Contingency Plan (NCP) criteria analysis. Following the meeting, written comments were also received from the City of New York.

RECOMMENDATIONS

CSTAG appreciates the Region addressing many of CSTAG's September 2023 comments in the proposed early action. For example, consistent with recommendations 2 and 5, the Region has included pre-design investigation (PDI) sampling elements to lessen site uncertainties and included options for the use of sealed bulkheads or in-situ stabilization/solidification (ISS) where warranted by site conditions. Inclusion of these approaches in the proposed plan should facilitate their application if needed and address concerns regarding significant unaddressed NAPL and impacts to protectiveness, especially when coupled to the proposed monitoring program. Based upon the materials and presentations provided, CSTAG continues to support the Region moving forward with the East Branch early action and believes the action will promote attainment of exposure-based and source-control RAOs.

CSTAG emphasizes that many approaches examined during this review were similar to those reviewed in 2023 and those CSTAG recommendations remain relevant. CSTAG is providing additional comments to provide clarity and enhance the successful implementation of the early action.

1. Rationale for the preferred alternative

The draft rationale for selecting the preferred alternative indicated that alternative EB-B "would raise the sediment bed thus potentially making it less resilient to the effects of climate change and sea level rise in the long term", and alternative EB-D "would remove and/or use ISS to treat deeper waste, thus likely making it more effective in the long-term at preventing exposure to or migration of contamination from below the capped area to the surface". These statements include the consideration of the impact of scour during current or future, more extreme flooding events (an issue also highlighted by the Community Advisory Group[6]). While the draft focused feasibility study (FFS) mentions the climate resiliency of alternatives, CSTAG could not discern whether alternative design directly considered remedy stability under potentially greater flow or hydrologic forcing. Regarding State acceptance, the Region also indicated that alternative EB-B would decrease the depth of water and, therefore, could impact water quality and may affect the ability of the long-term control plan to reach its goals. Overall, the Region indicated that alternative EB-D represented the best balance of tradeoffs. Although the remedies are ranked similar in protectiveness, the cost differential between remedies EB-B and EB-D is significant.

Recommendation

CSTAG recommends strengthening the technical justifications for supporting alternative EB-D over EB-B. For example, it was unclear whether alternative EB-B will be less resilient to sea level rise (as suggested in the rationale) or if the increased mudline elevation will result in

[6] Newtown Creek Alliance Storyboard: https://storymaps.arcgis.com/stories/6da99ef2245f4be3b4529ddcd6bc2e7c

increased localized erosion and possible overbank flooding during significant storm surge and high rainfall events that result in CSO discharges. The Region should describe how the preferred alternative was evaluated for resiliency to the effects of climate change and sea level rise.

2. Technology application in the preferred alternative

The description of the preferred remedy includes "[d]eeper dredging and/or the use of targeted ISS in areas identified based on the following considerations: potential for upward NAPL migration from the deeper soft and/or native sediment, potential for exposure to principal threat waste, depth of sediment to uncontaminated material, and relatively high COC concentrations in sediment (i.e., "hot spots")." The approach reflects that certain areas may have greater contamination or conditions that can influence future COC exposures and is consistent with CSTAG's previous recommendation to maximize flexibility in the face of implementation challenges and new findings (recommendation 5, September 2023). The determination of whether and where to remediate or treat deeper sediments will be consequential in terms of remedy protectiveness and long-term effectiveness, but also to cost and ease of implementation.

The Region, in conjunction with the State and PRPs, have done significant work in a challenging environment to differentiate NAPL forms, sources, and its potential for transport and exposure, and have sought to use that information to inform remedial approaches. The variation and complexity of the NAPL, sediment bed characteristics, and the current and future NAPL exposure and transport processes defy simple characterization and uniform solutions. CSTAG supports the Region's overarching approach that area-specific remedy determinations are guided by the need to achieve and maintain the exposure-based and source-control RAOs and may require treatment, removal, or additional source control such as bulkheads. CSTAG also agrees that not all sources of NAPL will be mobile or of sufficient mass or volume to pose a significant risk of exposure, and that it may not be practicable or beneficial to treat all expressions of NAPL.

The cumulative effect of the actions and common elements described in the preferred alternative are intended to address NAPL that may be mobilized from the subsurface. A robust pre-design investigation and post-construction monitoring program is proposed (and needed) to determine if subsurface NAPL continues to be a source of toxic material to surface sediments where exposure occurs, and to identify where NAPL or other COCs from ongoing external sources (including seeps or sheens) persist.

Recommendations

a. CSTAG recommends that the Region provide additional detail in alternative EB-D on where "[d]eeper dredging and/or the use of targeted in-situ stabilization (ISS)" will be applied and how the selection among those two approaches will be determined.

b. CSTAG recommends that prior to the remedial design, the Region consider developing a decision tree that provides criteria or lines of evidence for requiring deeper dredging or treatment via ISS to mitigate subsurface sources of toxic materials to the post remediation surface sediments. This decision process would be informed by the PDI and lateral groundwater/seeps investigation. This process would inform decision making for additional source controls or optimization within the study area and would allow the Region to learn means and methods for addressing NAPL while developing remedies for the remaining portions of Newtown Creek.

3. Additional considerations for developing an adaptive site management (ASM) approach

The Region provided that "[a]s part of the adaptive management approach for the site, robust post-remedy implementation monitoring will be conducted and impacts from external sources of contamination that need to be addressed will be addressed by the appropriate party…" This approach indicates that effectiveness of the early action will be evaluated, and issues addressed if they arise. The Region developed an RAO-PRG framework as part of the ASM strategy where interim evaluation measures (IEMs) will be used "to measure progress and to determine if any ongoing sources of contamination… are impacting the protectiveness of the remedy." The current criterion in the framework for considering additional source control measures is whether surface sediment COC concentrations continue trending towards the long-term remediation goals.

CSTAG understands that the ASM strategy is a work in progress and many details are not yet available, however, the timing for considering additional source actions is not indicated. As stated in EPA's 2022 ASM guidance[7] "[e]stablishing the evaluation and decision timepoints provides certainty that performance will be evaluated and that additional actions will be conducted, if necessary, based on progress towards objectives."

As noted in the consultation memo, the ASM strategy "will help formalize the process for how this early interim action, and potentially others, will support full cleanup of the Site". Part of the long-term monitoring program will be to "[p]rovide a baseline data set for long term OU1 monitoring evaluations." While the full ASM strategy need not be finalized before selecting the early action, baseline sampling should occur prior to remediation to support ASM, and design and implementation planning will need to be a priority to ensure timely completion of the baseline monitoring.

Recommendations

a. CSTAG recommends that in the ASM strategy, the Region should include a discussion of evaluation and decision timepoints to document when data will be evaluated, and when the evaluated data will be used to make decisions on remedy adaptation. The appropriate timing for this decision will be an important but challenging determination, and should consider the action timing, expected trends in contaminated media, measured results, and stakeholder expectations.

b. CSTAG recommends that baseline monitoring to support the ASM strategy occurs before the early action is implemented. The Region should provide sufficient detail in the ASM strategy to develop the baseline monitoring program to understand how the early action RAOs support the site-wide RAOs and how progress towards those site-wide RAOs will be monitored. These aspects of the ASM strategy are particularly important for designing the baseline monitoring program that supports both this initial early action and the site-wide, long-term monitoring. Additional recommendations on the baseline sampling are provided in recommendation 6.

4. East Branch interim action monitoring

In addition to the RAOs, other objectives of the early action include 1) gathering information to identify needs for additional source control and remedy optimization within the study area, and 2) informing remedies in the remaining portions of Newton Creek. Further, early action monitoring is intended to identify potential sources of recontamination from multiple pathways (e.g., subsurface sediments/NAPL, external inputs from uplands and stormwater, as well as unremediated sediments in Newtown Creek). Given the complexity of the contamination and the importance of the early action effectiveness evaluation for future decision making, a robust monitoring approach is appropriate to ensure sufficient data are

[7] Available at: https://semspub.epa.gov/work/HQ/100003040.pdf

available to identify and differentiate any potential sources of recontamination and evaluate progress toward RAOs.

In September 2023, CSTAG recommended that specifics on the monitoring program be provided within the FFS and record of decision (ROD) and that "[w]hile it is recognized that details regarding specific sample sizes and locations may not be known at the time of the ROD, the monitoring objectives, parameters, and design to satisfy those objectives should be provided to the extent possible." CSTAG appreciates the additional discussion in the Tier 2 consultation memo including on proposed media, sampling area, timing, COCs, and the determination of acceptable concentrations in construction and long-term monitoring phases.

Recommendations

a. CSTAG recommends that the Region consider whether it would be useful to differentiate between performance and RAO monitoring within the long-term monitoring objectives. Performance monitoring provides data to evaluate whether the constructed remedies (e.g., caps, ISS) are performing as designed whereas RAO monitoring is designed to evaluate whether conditions are trending towards or achieving RAOs. By developing sampling and evaluation approaches specific to these different objectives, the results can be more readily used to distinguish any performance issues associated with the constructed portion of the remedy from ongoing sources contributing to any lack of remedy performance.

b. CSTAG recommends that in addition to the media of interest listed in the consultation memo, the Region may find it useful to add the following:

- Dissolved phase surface water COC concentrations using passive samplers to complement the pore water and surface water particulate sampling already planned. These data could be used to support differentiation of external inputs from performance of the constructed remedy in addition to detecting trends in surface water conditions before construction, during construction, and post construction.
- Bank inspections for erosion and possibly soil sampling if surface sediment conditions are not meeting expected remedy performance.
- Combined sewer overflow/municipal separate storm sewer system/stormwater and direct drainage, in the event these data are not already collected by others.

c. CSTAG recommends that the Region include the key aspects of the long-term monitoring program identified in the Tier 2 consultation memo (and above) in the proposed plan and ROD to set expectations for robust monitoring.

5. SWAC based comparison to the IEMs and compliance with the risk based PRGs

In the Region's response to the September 2023 CSTAG recommendation on ASM, they noted that the SWAC-based IEMs and PRGs would be applied on a reach-wide basis, at least until such time that a study area-wide remedy is selected. CSTAG appreciates the clear demarcation of the SWAC area and supports this approach for the IR.

Recommendation

CSTAG recommends that methods to evaluate compliance with SWAC-based PRGs be clearly defined in the FFS and interim ROD. For example, will compliance be defined as the 95% upper confidence level on the mean is less than the PRG, as recommended in US EPA 1989, or as a

statistical comparison of the mean to the PRG, following the statistical recommendations in US EPA 2006?[8] The Region should also consider specifying that monitoring and compliance data will be collected using spatially unbiased study designs.

6. Considerations for baseline and long-term site-wide monitoring

The RAOs for this early action include reducing human exposure to COCs from ingestion of fish and crab by preventing biota exposure to COCs in sediments. The fish and crabs targeted for consumption spend only a portion of their time on site and may require a long time or multiple remedial actions to show any meaningful trend in tissue concentrations. As the cleanup in the East Branch and other areas proceeds, it will be important to understand and to communicate the extent to which COCs in fish and sediment have declined or result from off-site exposures. Passive samplers deployed in the surface water (see recommendation #4) may be able to detect meaningful trends earlier than is possible with fish tissue COC concentration data.

Recommendation

CSTAG recommends that the Region document how fish and crab COC reductions will be monitored and used in the ASM plan and site decision making. Passive samplers may prove a useful surrogate and consistent indicator of East Branch and sitewide COC trends.

[8] US EPA. 1989. Methods for Evaluating the Attainment of Cleanup Standards, Volume 1 Soils and Solid Media. EPA 230/02-89-042.
US EPA. 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA QA/G-4. EPA/240/B-06/001.