UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

DATE: October 7, 2015

SUBJECT: Region 2 Responses to CSTAG Recommendations on the Newtown Creek Contaminated Sediment Superfund Site

FROM: Caroline Kwan, Remedial Project Manager
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TO: Stephen J. Ells, Chair
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The EPA Region 2 Newtown Creek Remedial Investigation/Feasibility Study (RI/FS) project team (the Region) appreciates the efforts of the Contaminated Sediment Technical Advisory Group (CSTAG) in connection with the Newtown Creek Superfund site (the Site). The recommendations provided by the CSTAG in its July 9, 2015 Memorandum will assist the Region in addressing the eleven principles identified by EPA for managing contaminated sediment risks at hazardous waste sites. By this Memorandum to the CSTAG, the Region provides its responses to the CSTAG's recommendations. The Region will continue to implement, whenever possible, the CSTAG recommendations as we move forward with the RI/FS and remedy selection for the Site. As the Site is still early in the RI/FS process, the Region will have ample opportunities going forward to incorporate many of the CSTAG's recommendations.

Principle 1 - Control Sources Early

1. **Recommendation:** 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 Combined Sewer Overflows (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.

   Response: The Region appreciates this recommendation and recognizes the importance of identifying potential ongoing contaminant sources to Newtown Creek, including point source discharges (discharges from piped conveyances and overland flows that discharge at specific points along the Creek) and groundwater discharges, characterizing these contaminant inputs and their human health and environmental risks and impacts, and identifying the appropriate remedies to address them, if necessary.

   The Region would like to clarify the ongoing efforts to characterize these potentially significant inputs. For assessing point sources to the Site, the Phase 2 RI/FS Work Plan includes:

   - reviewing information on known point sources,
   - conducting field surveys to confirm the reviewed information and to identify previously unknown point sources,
   - categorizing and sampling the representative point sources and their associated contaminant loads, and

- developing a methodology to extrapolate the findings from the sampled point sources so that loadings from all point source discharges can be estimated based on their respective drainage areas.

The Phase 2 point source sampling is currently ongoing. Planning tasks for the point sources investigation included a detailed review of existing point source surveys and permit records, as well as dry- and wet-weather field surveys of the entire Creek to identify point source discharges. The Draft Sources Sampling Approach Memorandum summarized these efforts and identified over 300 discharge points to Newtown Creek, some of which have been closed or are no longer used. While the flows and loadings of many of the smaller conveyances are unknown, an extensive field effort to quantify the chemical loading associated with discharges to Newtown Creek is currently ongoing.

The point source sampling program includes collection of up to four samples at each of 30 point source discharges representing approximately 84 percent of the point source discharge volume to Newtown Creek. Samples are being collected from various types of point sources including CSOs, stormwater discharges, individually permitted (State Pollutant Discharge Elimination System [SPDES]) discharges, overland flow discharges, wastewater treatment plant discharges, highway drains, and general permit discharges. Overland flow discharges were included in the point source sampling program because the discharges are well defined and discharge at discrete points. Leaking bulkheads and eroding shorelines are being considered for further evaluation.

The sampling data will be used to estimate contaminant loading to Newtown Creek from point source discharges. As of October 7, 2015, approximately 75 point source samples have been collected from storms of varying intensity, rainfall amounts, and storm durations. The data collected during the point source program will capture the majority of the significant sources identified in the point sources inventory and will be sufficient to extrapolate loading estimates for the relatively small portion of the discharge volume not captured by the point sources sampling program. The Region believes that the forthcoming point source data will be sufficient to characterize contaminant loading to Newtown Creek and support remedy selection.

A groundwater investigation program was also conducted, to identify non-point source contaminant loads to the Creek from groundwater discharge and to support groundwater modeling. In-creek groundwater, porewater and seepage rate data were collected to characterize contaminant loading to Newtown Creek via groundwater discharge to the sediment bed and underlying native materials, including groundwater discharged under, around or through bulkheads and other shoreline structures. Completed in August 2015, the groundwater assessment also included the installation of upland wells, groundwater profiling and sampling in native materials and sediments, long-term water level monitoring, and hydraulic testing. Again, the Region believes this information will be sufficient to characterize contaminant loading from groundwater discharge and seepage into the Creek and support remedy selection, which is consistent with the goal of this CSTAG recommendation.

This recommendation also suggests that the Region further consider potential impacts from planned residential development along the Creek. In response to this recommendation's concern

that loadings from CSOs may increase because of newly planned residential developments, the Region will review available documents, such as the New York City CSO Long Term Control Plan, site plans, permit applications and other documents, as identified by New York City to identify and evaluate potential increased loadings to Newtown Creek.

Principle 2 - Involve the Community Early and Often

2. **Recommendation:** 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.

   Response: Following careful review of this recommendation, the Region has planned for and initiated several new components to community outreach efforts. The Region recognizes that an informed and engaged community is essential to the success of any major remedial activity, and is fully committed to maintaining meaningful community involvement. The Region is also always looking to identify opportunities for improved interaction with the community stakeholders. The following additional/improved community involvement activities are being considered by the Region or have already been initiated as a result of the recommendation.

   - Improving the Newtown Creek Group's (NCG's) website, specifically making the document repository more user-friendly and improving download speeds
   - Updating the EPA website regularly to provide the community with the most recent information and documents
   - Finding opportunities for more frequent update meetings and/or calls with the Community Advisory Group (CAG) and the greater community
   - Providing a streamlined path for community reviews and comments on major deliverables
   - Providing the community with access to validated data in a more timely fashion
   - Providing outreach materials in multiple languages

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

3. **Recommendation**: 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 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. [1]

Response: This CSTAG recommendation is appreciated, as communication and collaboration on these issues is a critical component towards the goal of restoring the Creek. As a follow up to this recommendation, the Region has carefully assessed our current communication with the State regarding this issue and is developing several follow up actions for further evaluation. While the Administrative Order on Consent (AOC)-defined "Study Area", which largely limits the remedial investigation under the AOC to the Creek itself, can present certain challenges, the relationship and high level of coordination between the Region and the New York State Department of Environmental Conservation (NYSDEC) has been helpful in addressing a number of issues. To date, the Region has worked collaboratively with NYSDEC on various Site investigation plan reviews for upland sources, proposed revised water quality standards for the Site, current upgrades to CSOs, and required actions being taken by the City of New York to attain compliance with the Clean Water Act (CWA) at Newtown Creek. The Region also intends to continue this coordination on the Superfund selected remedies and early source control measures, including eliminating/permitting existing point sources to the Site.

As mentioned above, the Region is in the process of developing several follow up actions to improve collaboration and coordination with NYSDEC. As an example, one plan under consideration includes the scheduling of regular meetings and/or teleconferences with NYSDEC CWA personnel, as well as EPA CWA personnel, to discuss/coordinate data collection and analysis, and to continue to identify potential actions for the reduction of point source discharges to the Site. In addition, the Region is considering additional communication and coordination with NYSDEC concerning State Superfund, Brownfield Cleanup and Petroleum Spill Sites which are located upland of the Study Area.

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

4. **Recommendation:** 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 EA (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 Conceptual Site Model (CSM). The Region is also considering whether a less sophisticated model may be

[1] Promoting Water, Superfund, and Enforcement Collaboration on Contaminated Sediment. 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

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.

Response: CSTAG's insight and comments on this topic are appreciated, and in response to the recommendation, the Region is reviewing the various models that have been proposed for the Site under consideration of the comments and points raised in the recommendation. The Region recognizes that shoreline erosion, groundwater discharge, and leaking bulkheads (including groundwater flow underneath bulkheads) can all contribute contaminants to Newtown Creek. The Region has had initial discussions with the NCG, New York City and NYSDEC regarding eroding shorelines as a potential contaminant source, and will consider additional data collection in these areas following further discussions with the NCG, New York City and NYSDEC (also see Response to Recommendation 13). As part of the groundwater investigation program, groundwater flow and chemical characterization data were collected that is relevant to the assessment of contaminated groundwater discharge via bulkheads, other shoreline structures, and the Newtown Creek sediment bed. Furthermore, the Region is evaluating any further assessment needs as part of the Region's ongoing data gaps analysis and will continue to do so as the project progresses.

Regarding modeling efforts, the Region has an ongoing process in place to conduct reviews of the models. This process includes workshops amongst the Region, the NCG, and New York City, and their respective consultants to discuss technical issues, next steps in the process, and a formal model review process. The Region's model review process includes maintaining records of all reviews that are conducted, as these reviews are essential to showing that model development, calibration and verification have been properly reviewed and that the models can effectively support decision making by the Region. These reviews have been presented in modeling approach memos and modeling result memos and will be included in the administrative record. In response to the CSTAG recommendation, the Region will continue to assess if the process described above is adequate and appropriate to allow for a robust review of how the models will be will constructed, calibrated, and validated and how the uncertainties will be identified.

5. **Recommendation:** 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.

Response: The Region recognizes the importance of determining sedimentation rates and the CSTAG's concern with the classification of the Creek as net depositional given the absence of maintenance dredging since the 1940s. The Region is following up on this recommendation, and as part of the follow up, has reviewed the existing information and recognizes that there are strengths and weaknesses associated with the various data types available for determining net deposition/erosion rates. As such, a multiple lines of evidence approach will be used to support a more robust assessment of sediment deposition/erosion rates at the Site, including spatial variability. The Region has worked with the Office of Research and Development to identify experts to examine existing data used to estimate deposition/erosion rates in Newtown Creek, including geochronology data, sediment core logs, and multiple bathymetric survey data (one survey conducted prior to and one survey conducted following Superstorm Sandy). EPA has also requested that these experts identify any data gaps in the sediment deposition/erosion data and provide recommendations for additional work, if necessary. The report is currently being prepared and is expected in fall 2015. The Region will review the conclusions of the report and evaluate what additional information may be necessary to address the CSTAG recommendation to more clearly understand the depositional rates of the Creek.

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

6. **Recommendation:** 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.

   Response: The CSTAG recommendation is acknowledged, and the Region understands the importance of early actions, when appropriate. The CSTAG's examples of potential early actions are especially helpful and will allow the Region to review the data with these considerations in mind. EPA has discussed with NYSDEC, the NCG and New York City, the need to identify potential early action areas within the Study Area, particularly regarding areas of NAPL and/or significantly elevated concentrations of contaminants of potential concern (COPCs). The Region is confident that the data collected as part of the Phase 1 and Phase 2 RI, such as NAPL and sediment data, will be useful in identifying any areas which clearly present unacceptable risks and require an early action. The identification of potential early action areas is a priority for the Region, and we will continue to discuss this important issue with NYSDEC, the NCG and New York City as more data have been reviewed and the CSM is refined.

7. **Recommendation:** 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 polycyclic aromatic hydrocarbons (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).

Response: Region 2 is working with the respondents and other stakeholders to develop a more detailed approach for evaluating the sediment quality triad (SQT) data that was collected as part of the remedial investigation. The framework for this approach, which was developed following EPA guidance, was presented in the Risk Analysis Plan section of the Problem Formulation Document and in Chapter 3 of the BERA Work Plan. In addition to the standard sediment quality triad, which incorporates benthic toxicity, sediment chemistry and benthic invertebrate metrics, pore water samples are also being collected at each SQT station for inclusion in the benthic evaluation. The pore water sampling includes using passive sampling devices, such as solid phase microextraction samplers and peepers to collect porewater samples as part of the risk sampling program. Toxic units following the guideline listed in the recommendation will be calculated and presented in the Baseline Ecological Risk Assessment report. The advice provided to the Region by CSTAG regarding the use of a multiple lines of evidence approach and identification of associated guidance will be helpful to the Region as we develop a more detailed decision process.

8. **Recommendation:** 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.

   Response: The Region agrees with CSTAG's recommendation to develop a robust data management plan in order to readily access and use the RI data for technical analysis, refining the CSM and facilitating response to stakeholders, particularly members of the public. A data management plan was developed by the NCG and approved by the Region in 2011. A separate data management plan was also developed by the NCG for the Region's split-sample data and was approved by the Region in 2014. These data management plans specify laboratory sample data formats, data deliverables formats, and data storage and management requirements. In addition, the EPA-approved Quality Assurance Project Plan (QAPP) identifies the collection, preparation, analytical and validation methods for all samples collected pursuant to the RI Work Plan. The EPA-approved QAPP also includes procedures for the collection and analysis of split samples for the EPA. The data collected under the EPA-approved QAPP will be used in the development of the RI.

   Any data submitted to the Region that was collected by other parties outside of the EPA-approved QAPP and without EPA oversight will be reviewed by the Region. Data not collected under the EPA-approved QAPP and under Region oversight will be considered on a case-by-case basis for usability in or comparison with the Region-approved RI/FS.

   In late July 2015, the Region discussed a more user-friendly approach with the CAG for the evaluation of data, including a series of presentations with interpretation and evaluation of the data as they become available.

9. **Recommendation:** CSTAG recommends that Region 2 consider reviewing the CSO data collected by the New York City Department of Environmental Protection (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 work plan, yet might be useful for site characterization.

   Response: As recommended by CSTAG, the Region is actively considering the scope of its future review of CSO data collected by the City outside of the approved work plan and, most recently, on September 28, 2015, met with representatives of the City to discuss this issue. The Region will continue to address CSTAG's recommendation to consider reviewing data collected outside of the EPA RI/FS and develop a plan for evaluating such data.

   A comprehensive sampling program has been developed and implemented to characterize CSOs and other point sources (see response to Recommendation No. 1). This program was developed with input from both New York City and the NCG, including CSO flow information provided by New York City. The field sampling effort is being implemented by the NCG in coordination with both the NCG and New York City.

   The Region is aware that both New York City and the NCG have collected data at-risk outside of the Region-approved QAPP and without Region oversight. Data collected outside of the EPA-approved work plan that is provided to the Region for consideration will be evaluated on a case-by-case basis, as indicated in the Region's response to Recommendation No. 8. The Region met with representative of New York City, at their request on September 28, 2015 to discuss several issues, including the City's request that their data be included in the RI/FS and/or administrative record. The Region advised the City that it would consider their at-risk data to the extent that such data may provide support for or diverge from data collected by the respondents' contractor pursuant to the approved work plan and under EPA oversight. However, the Region is confident that the multiple rounds of data collected under the EPA-approved work plan will accurately characterize contamination at the Site.

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

10. **Recommendation:** 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.

    Response: The Region agrees with this CSTAG recommendation on the importance of developing accurate background concentrations for the primary contaminants of concern, especially given

their significance in informing remedy decisions. To provide more background on the Region's efforts to follow up with this recommendation, the following activities are being conducted. Currently, the Region is reviewing the data collected from 14 site-specific background areas identified for this RI to determine if additional data are needed to characterize background. In addition, the Region will review the referenced study to determine if its conclusions are appropriate for use in the RI/FS, and will also be reviewing similar investigations in the Region to develop a comprehensive understanding of potential background concentrations for the RI/FS. To clarify, the background study referenced in this recommendation was performed by consultants to Con Edison, not by the NYSDEC. As an example, the Region will be reviewing the Con Edison background study for the East River (accepted by NYSDEC to establish remedial goals for East River manufactured gas plants) to determine if, and how, it can be used to support determination of background concentrations for Newtown Creek. Any background studies in which data were not collected under a Region-approved QAPP will be evaluated for usability at the Site as outlined in the Response to Recommendation 8.

11. **Recommendation:** 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.

    Response: The Region agrees with CSTAG's identification of the potential significance of fish tissue contaminant data given the presence of PCB contamination at the Site, and recognizes its influence on human health risks. To date, biota data have been collected through a sampling event that spanned several months over the course of one summer, June – August 2014. The Region recently completed an evaluation of the existing biota tissue data sets as part of its ongoing data gaps analysis. Following the completion of our review of this data set in October 2015 and in consideration of this CSTAG recommendation, EPA directed the respondents to collect additional tissue data in order to reliably evaluate risks prior to the Region making remedy decisions. The Region continues to have discussions on how to develop and implement this effort in a manner that most efficiently utilizes the resources of both the respondents and the Region.

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

12. **Recommendation:** 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.

Response: The Region appreciates the recommendation and recognizes that this approach has been successfully implemented at other sediment sites. Some basic divisions of the Study Area, including tributaries, the turning basin, and the mouth of Newtown Creek have already been identified. As a result of the recommendation, the Region is investigating further division of the Site into smaller decision units on the basis of various site characteristics, including site geomorphology, sedimentation characteristics, risk, and contaminant distribution. The creation of smaller decision units during the data evaluation process may also be helpful in the determination of any early actions at the Site.

13. **Recommendation:** 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.

    Response: As a follow up to this recommendation, the Region has reviewed the project activities that are focused on characterizing bulkheads to assess if the current scope is adequate. The Region recognizes the potential importance of bulkheads as part of any comprehensive remedy, and the resulting need to work collaboratively with the respective property owners. The groundwater investigation program will provide data to assess the potential contaminant discharge to the Site both under and through leaking bulkheads and other shoreline structures (also see Response to Recommendation 4). As data from these investigations become available and are reviewed, the Region will continue to assess how bulkheads may contribute to contamination in the Creek and whether improvements may be included in any remedy.

14. **Recommendation:** 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.

    Response: The Region recognizes that ebullition may be a significant contaminant transport mechanism at the Site. Following receipt of this recommendation, the Region requested that a qualitative ebullition field survey program be conducted as part of the Phase 2 RI. The ebullition field survey program was completed in August 2015 and identified several potential areas of ebullition within the Creek. The ebullition survey included areas where NAPL has been identified in sediment and areas where NAPL is known to be present in upland sites adjacent to Newtown Creek. Based on the preliminary findings of the survey, the Region has notified the NCG and New York City that a more robust quantitative assessment of ebullition and ebullition-facilitated contaminant transport will be required. EPA will complete a full review of the NCG's findings and conclusions following a presentation of the results by the NCG on October 22, 2015.

    NAPL distribution was also investigated as part of the Phase 2 RI. The NAPL investigation

included use of a standardized methodology for visual characterization and logging of all cores and the performance of shake tests on 152 cores where visual observations such as sheens, coating, or staining indicated the potential presence of NAPL. As part of the Region's continued and more frequent coordination with NYSDEC, the Region will also coordinate with NYSDEC to ensure that upland facilities known to contain NAPL contamination do not serve as long-term sources of contamination to the Site.

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

15. **Recommendation:** 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.

    Response: As a follow up to this CSTAG recommendation, the Region has evaluated the data review process following the completion of most of the Phase 2 field work (with the exception of the point source investigation, the Phase 2 field work is complete). The Region has requested that Anchor QEA develop a series of presentations on various key aspects of the investigation, including NAPL, ebullition, human health and ecological risk assessment data, groundwater, and background, to be delivered to the Region over the next few months. The purpose of these presentations is to provide the Region with a summary of the data and an interpretation of the data so that the Region can determine if the data are robust enough to allow for the development of an RI, the first step in moving towards the development of RAOs and remedial goals and, ultimately, remedy selection. Any data gaps identified during this process will be evaluated to determine if the data gaps are sufficiently significant that further RI sampling is needed, or if the data gaps can be filled during later efforts, such as through sampling conducted as part of the FS or during any pre-design investigations that are conducted post-remedy selection. This effort was developed, as a follow up to the CSTAG recommendation, in an effort to develop a plan that most efficiently utilizes both staffing and economic resources of both the Region and the respondents.