Newtown Creek Superfund Site
East Branch Early Action pre-CSTAG Briefing
Queens and Brooklyn, New York City
June 20, 2023

General Context for East Branch Early Action

- The Remedial Investigation and Feasibility Study (RI/FS) for the Newtown Creek Study Area has been ongoing since 2011
- Highly complex system
- We have enough information to consider selection of a remedy for a portion of the site now while the RI/FS for the entire Study Area continues.
- Purpose of this presentation is to discuss the potential Early Action (EA) for the East Branch and the upcoming meeting with Contaminated Sediments Technical Advisory Group (CSTAG)

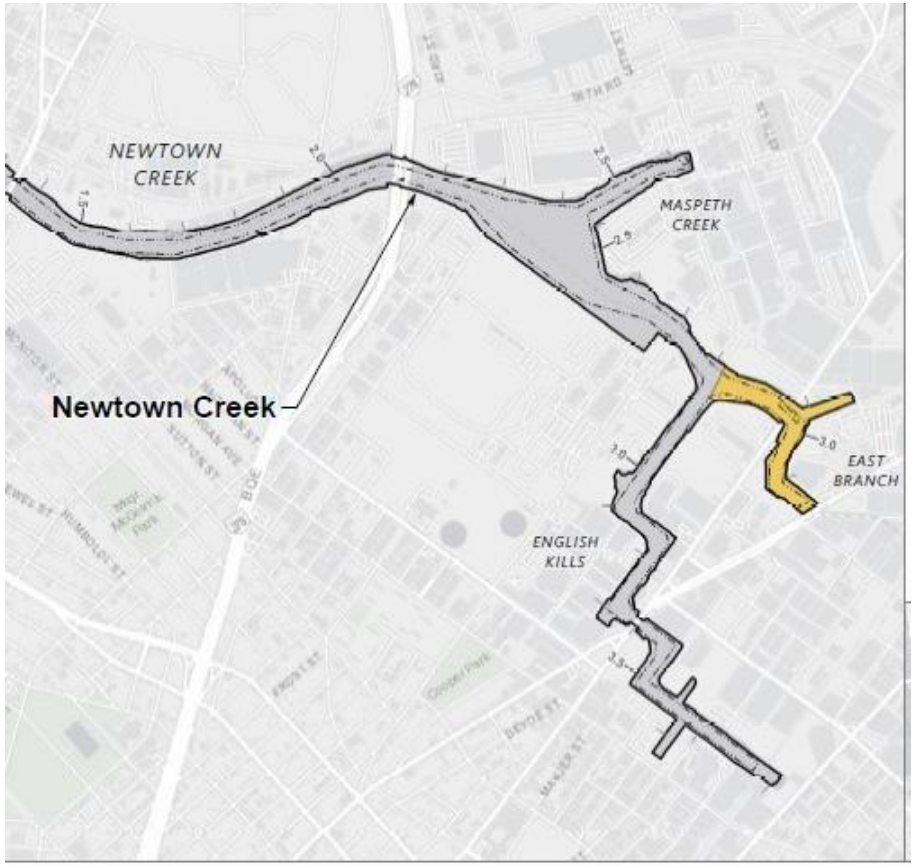
CSTAG Involvement in Sediment Sites

- **Purpose of CSTAG:**
  - Assist in the management and implementation of nationally consistent sediment characterization and remedial actions
  - Help remedial project managers (RPMs) and regional/headquarters decision-makers responsible for large and potentially expensive and/or controversial contaminated sediment sites
  - Promote the use of state-of-the-science tools and methods
  - Enhance national consistency in the characterization and management of sediment sites by providing a forum for exchange of technical information
  - Stakeholders are expected to be informed of CSTAG meetings and encouraged to provide written comments prior to all meetings.
- **Two tiers of consultation for contaminated sediment sites**
  - Tier 1: Sediment action will address more than 10,000 cubic yards or five acres of contaminated sediment.
  - Tier 2: Sediment action that addresses "a small number of large, complex or controversial contaminated sediment sites"

Purpose and agenda for CSTAG Meeting July 2023

- **Path Forward**
  - The next meeting in July will be for stakeholders to provide feedback to CSTAG on the potential EA in the East Branch - **early in the process**
  - CSTAG will provide recommendations to EPA R2 that will help guide the development of a Focused Feasibility Study (FFS)
  - Upon completion of FFS, a Proposed Remedial Action Plan (PRAP) will be developed and available for public comment
  - EPA will meet with CSTAG again prior to releasing the PRAP
- **Agenda**
  - **July 11 - CSTAG/EPA**
    - Site Tour, Overview of Operable Unit 1, Detailed Review of EB CSM and Alternatives
  - **July 12 – Stakeholders/PRPs/CSTAG/EPA**
    - Presentations to CSTAG
  - **July 13 – CSTAG/EPA**
    - Feedback/discussions

General Overview East Branch



Tributary of Newtown Creek

- Approximately 0.5 miles in length
- Surface area ~10 acres
- Depth 10.3-16.5 ft in channel and shallower at head of tributaries
- Extensive investigations completed as part of the Remedial Investigation (RI) and Feasibility Study (FS)

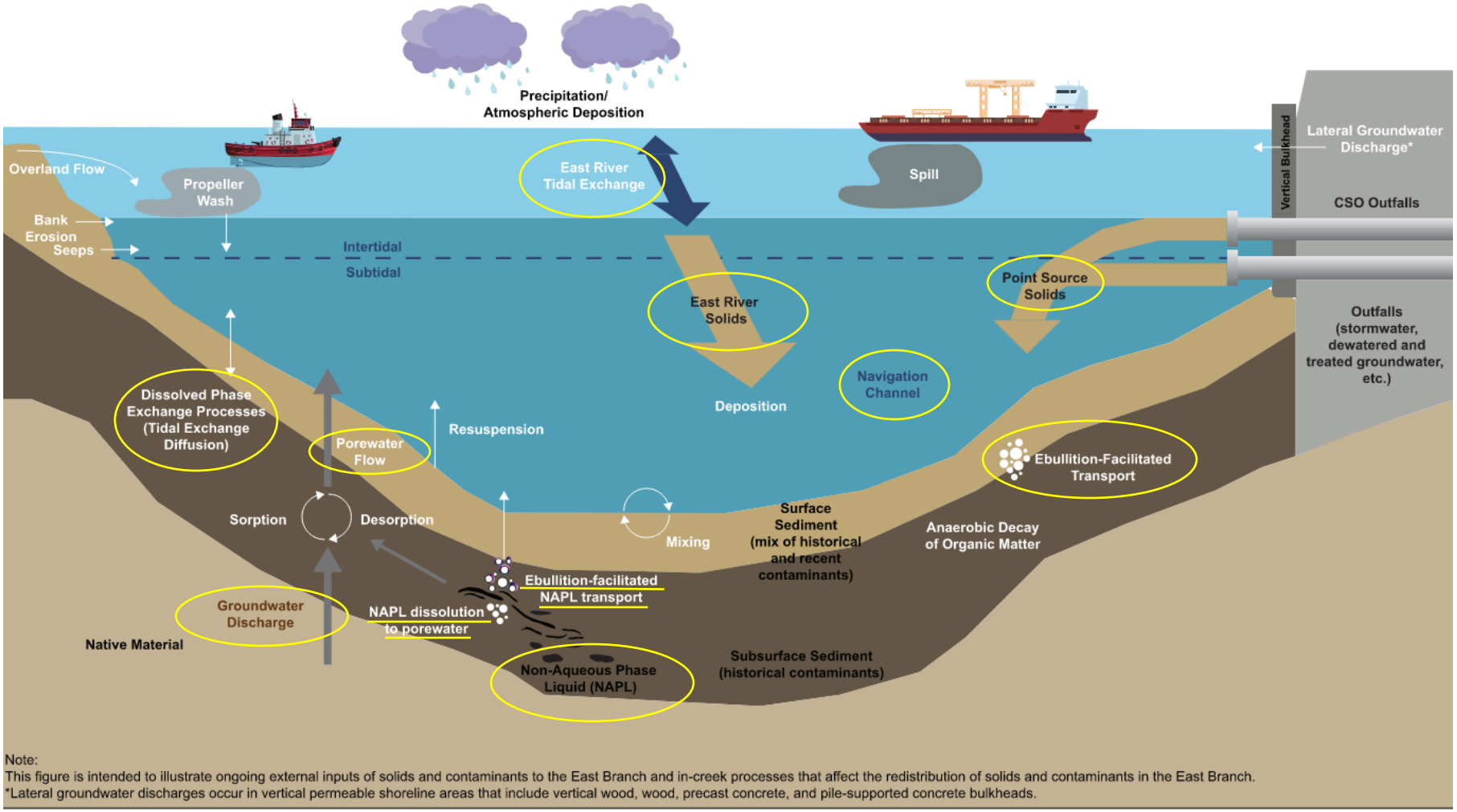
Rationale for Conducting an EA in East Branch

- Expediate the overall site response by implementing remedial action in one of the most upstream portions of the study area
- Will result in immediate risk reduction and contaminant mass removal in at least this portion of the creek
- Opportunity to gain direct experience conducting cleanup work in the creek
  - Will help inform future efforts
  - Logistics
- Opportunity to further refine the Study Area-wide Conceptual Site Model (CSM)
  - Robust post-implementation sampling would be conducted
  - If assumptions are not accurate, the data will tell us

Key Points to Keep in Mind

- The contaminants of concern (COCs) and their risk-based Preliminary Remediation Goals (PRGs) have been developed as part of the full OU1 RI/FS process
- A robust post-remedy monitoring program will be conducted
  - Performance measures will be used to determine if any additional actions are needed
  - Additional actions could be needed to address sources of contamination either within the Creek or from ongoing sources outside of the Creek
  - The additional actions may be conducted either under federal Superfund authority or through State authority
  - Either way, the performance monitoring will help inform future actions at the Site.

Key Aspects of the East Branch Conceptual Site Model



Note:
This figure is intended to illustrate ongoing external inputs of solids and contaminants to the East Branch and in-creek processes that affect the redistribution of solids and contaminants in the East Branch.
*Lateral groundwater discharges occur in vertical permeable shoreline areas that include vertical wood, wood, precast concrete, and pile-supported concrete bulkheads.

Figure is adapted from Figure 8-1 in the Remedial Investigation Report, RI/FS, Newtown Creek, March 2023 prepared by Anchor QEA.

East Branch Conceptual Site Model

Key Aspects of the East Branch Conceptual Site Model

- Physical Setting
  - Shoreline/bulkhead conditions
  - Authorized navigation channel present throughout a majority of the East Branch
  - Tidal ranges – up to 5 feet
  - Hydrodynamics dominated by tidal flows and storm-driven freshwater inputs from point source discharges and overland flow
  - Important infrastructure – Grand St bridge and utility crossings
- Contaminated Inputs to the Study Area
  - Historical inputs
  - East River solids via tides
  - Point source solids via outfall discharges
  - Lateral groundwater*

*Lateral groundwater is currently being investigated by EPA.

East Branch Data Summary and Contaminant Characterization (Figures from memo)

Key Aspects of the East Branch Conceptual Site Model

- Contaminated Media within the Study Area
  - Surface water
  - Surface and subsurface sediment
  - Sediment porewater
  - Vertical groundwater flow/porewater exchange with surface water
  - NAPL present in subsurface sediment
- Important F&T Processes within the Study Area
  - Net depositional environment except in areas of CSO discharges
  - Contaminant flux from sediment to surface water
  - Ebullition-facilitated contaminant/NAPL transport from study area sediments
  - Dissolution of NAPL
  - Vertical groundwater flow/porewater exchange with surface water

Contaminants of Concern and Risk-Based Preliminary Remediation Goals (PRGs)

Contaminants of Concern	Risk-Based PRG	Most Sensitive Receptor and Exposure Pathway
TPCBs	0.30 mg/kg	Humans via crab consumption
Dioxins/Furans TEQ	18 ng/kg	Humans via crab consumption
Copper	490 mg/kg	Mummichog via dietary intake
Lead	340 mg/kg	Spotted sandpiper via dietary intake
TPAH(34)	100 mg/kg	Benthic macroinvertebrates via sediment toxicity
C19-C36 Aliphatic Hydrocarbons	200 mg/kg	Benthic macroinvertebrates via sediment toxicity

Notes:
TPCBs – total polychlorinated biphenyls
TEQ – toxic equivalence quotient
mg/kg – milligrams per kilogram
ng/kg – nanograms per kilogram

Remedial Action Objectives (RAOs)

- The tentative OU1 sitewide RAOs are as follows:
- Exposure-Based Remedial Action Objectives
  - Reduce human exposure to fish and crab ingestion risks above protective levels by reducing the concentrations of COCs in contaminated sediment to protective PRGs/RGs.
  - Reduce ecological exposure to site COCs in sediment above levels to protective of ecological populations PRGs/RGs.
- Source Control Remedial Action Objectives
  - Reduce migration of site-related Non-aqueous Phase Liquid (NAPL) and other sources within the Study Area to sediment and surface water above levels that are protective for human health and ecological exposure.
- The interim early action for the East Branch Early Action will help work toward achieving the tentative sitewide RAOs

Navigational Considerations

- Newtown Creek is an authorized federal navigation channel
- Under an Interagency Agreement with EPA, USACE is conducting a navigational analysis for the entire Site
  - Authorized depth varies throughout creek
  - Portions may be eligible for reauthorization but we know at this point that full deauthorization is not possible
- Authorized depth is currently set at 20 feet for the East Branch area
  - Constructed depth of 16 feet
  - Current bathymetry generally ranges from about 3 feet to 16.5 feet across the East Branch portion of the site.
  - Note that the USACE has not dredged the creek for navigational purposes since 1974

Remedy Development

- East Branch FFS will evaluate remedial alternatives for the East Branch
- Initial screening of alternatives has been developed
  - focus is on dredging with capping across the entire East Branch
- Five alternatives developed in addition to No Action
  - Each alternative developed varies by depth of sediment to be removed
  - Alternatives have a number of common elements

East Branch Early Action Alternatives Memorandum Summary: Common Elements

- Pre-design Investigation
  - To obtain any additional required information for development of the early action remedial design
- Institutional Controls, if necessary
- Dredging
  - Applied to varying depths in the alternatives
- Capping
  - Caps placed in areas where sediments are not dredged to native material or where high groundwater dissolved phase COC concentrations and/or high rates of advection in native material are present
  - Assumed 3-foot thick armored/reactive cap for most alternatives (thickness subject to change in the FFS)

East Branch Early Action Alternatives Memorandum Summary: Common Elements

- In situ Stabilization (ISS)
  - Treat NAPL present in sediments of the East Branch to reduce contaminant dissolution from NAPL and reduce the potential for ebullition-facilitated NAPL transport
  - Assist in control of groundwater flow through heavily contaminated soils or sediments
- Slopes or Shoreline Stabilization Measures
  - Stabilization measures to address potential for negative impacts to shoreline or sediment slopes from dredging
  - May include ISS, limits on means and methods of dredging, and/or temporary or permanent structural support
- Dredged Material Management and Disposal
  - Handling and offsite treatment and disposal
  - Potential for beneficial use
- Monitoring
  - Baseline, construction, and long-term monitoring

East Branch Early Action Alternatives Memorandum Summary: Variations

- Alternative EB-A – No action
- Alternative EB-B
  - Dredge sediments (approximately 2.5 ft) to elevation -3 feet Mean Lower Low Water (MLLW) level
  - Place 3-foot-thick armored/reactive cap which would be at or below 0 feet MLLW to maintain cap saturation
  - Increases mudline elevation and reduces water depth
- Alternative EB-C
  - Dredge 3 feet of sediment
  - Place 3-foot-thick armored/reactive cap
  - Maintains mudline elevation and water depth
- Alternative EB-D
  - Same as Alternative EB-C; however, additional sediment removal down to native material in select areas to optimize the remedy
  - Areas where sediment is not removed to native: Place 3-foot-thick armored/reactive cap
  - Areas where sediment is removed to native: Place either a sand backfill layer to manage residuals or an armored/reactive cap based on site-specific conditions

East Branch Early Action Alternatives Memorandum Summary: Variations

- Alternative EB-E
  - Assumes the need to maintain the current federally authorized navigation channel depth
  - Within the navigation channel area of deep dredging to account for side slopes: Dredge sediment to a depth necessary to accommodate a 3-foot-thick armored/reactive cap below the authorized depth plus a buffer or to native material, whichever is shallower
  - Outside of navigation channel and area of deep dredging to account for side slopes: Combination of dredging and capping would be performed
  - Areas where sediment is removed to native: Place either a sand backfill layer to manage residuals or an armored/reactive cap based on site-specific conditions
- Alternative-EB-F
  - Dredge all sediment to native material
  - Place either a sand backfill layer to manage residuals or an armored/reactive cap based on site-specific conditions
  - Shoreline stabilization measures will likely be extensive given depth of dredge

General Outline of Approach - Remedy Effectiveness

Set long-term cleanup goals equal to long-term risk-based human health and ecological endpoints

Determine interim performance measures

Approaches for Evaluation of Remedy Effectiveness:

Predictive Models

- **Long Term Equilibrium (LTE) Model**
  - Originally implemented by NCG as a transparent easy-to-use spreadsheet tool
  - Being refined by EPA (probabilistic model) - alternative input assumptions
  - Empirical data used as part of the RI/FS process
  - **Model can be used to:**
    - Develop interim performance measures
    - Assess changes in LTE concentrations in response changes to COC loadings, e.g., OU2 CSO LTCP
    - Assess the need for source control measures
- **Chemical Fate and Transport (CFT) Model**
  - More complex model
  - Applied on smaller spatial scales
  - **Model can be used to:**
    - Similar applications as LTE model
    - Evaluate remediation alternatives of selected portions of creek
    - Empirical data used as part of the RI/FS process

Approaches for Evaluation of Remedy Effectiveness:

Performance Monitoring

- Performance Monitoring Plan to be developed during Remedial Design
- Monitoring Phases
  - Baseline (pre-construction) monitoring
  - Construction-phase monitoring during and directly after remedy construction
  - Operations, maintenance, and monitoring after remedy implementation
  - Long-term monitoring
- Long-term monitoring
  - Determine remedy achievement of the sitewide RAOs over time
  - Data evaluated against the interim performance measures
- Monitoring results will be used to help inform future action

CSTAG Meeting July 2023

<u>July 12</u> – Stakeholders/PRPs/CSTAG/EPA

- In person/virtual meeting at EPA office
- Stakeholders can make a presentation or provide written/oral statements to CSTAG
- Stakeholders can attend all stakeholder presentations
- Stakeholder materials will be made available to all stakeholders

QUESTIONS

Thank You!

- For further information, please contact:

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- Or visit EPA's Site Profile Page for Newtown Creek

  - www.epa.gov/superfund/newtown-creek