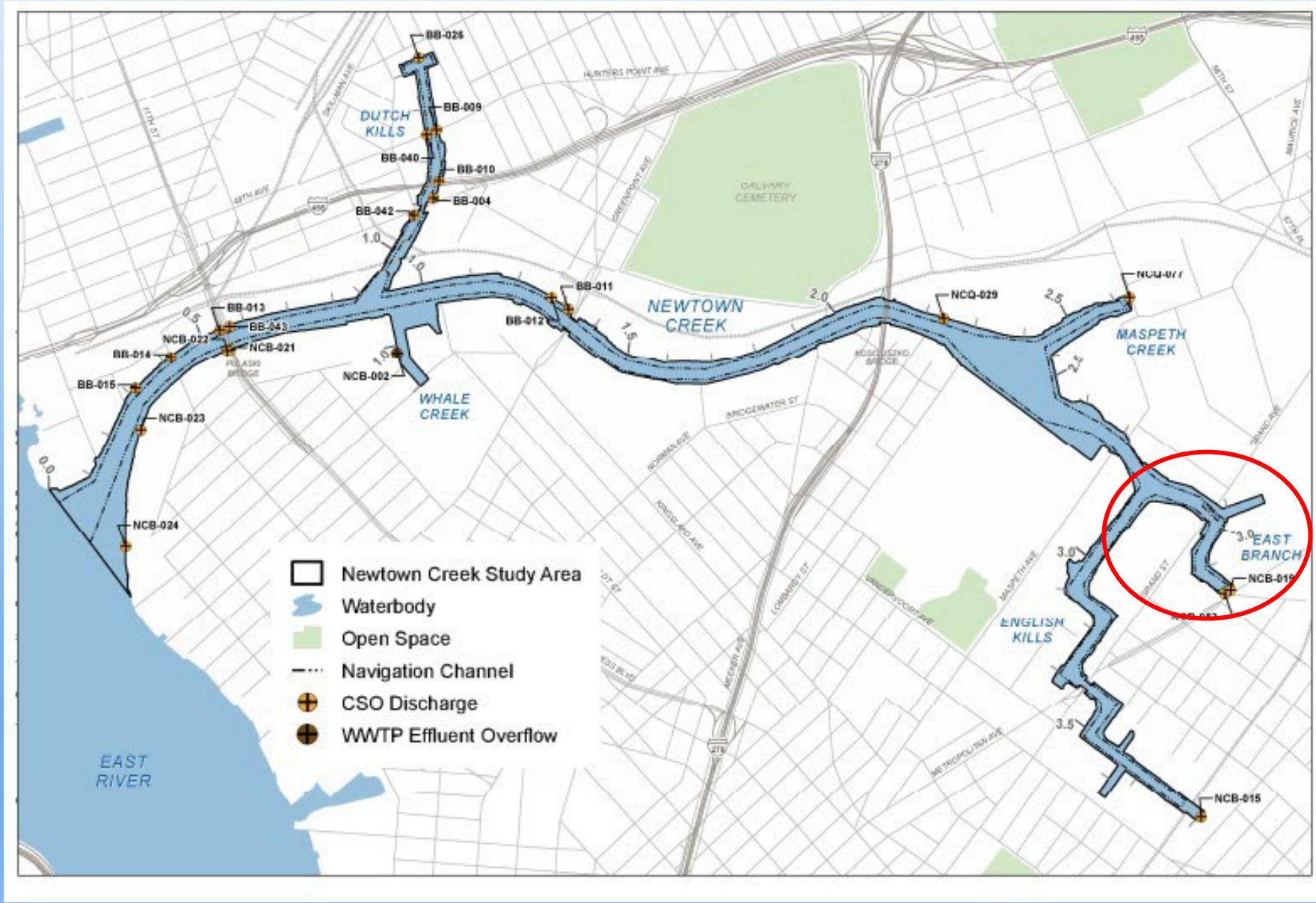
East Branch Early Action
Overview of Remedial Alternatives Evaluated in the Draft Focused Feasibility Study
Newtown Creek Superfund Site CAG Meeting
May 22, 2024

Study Area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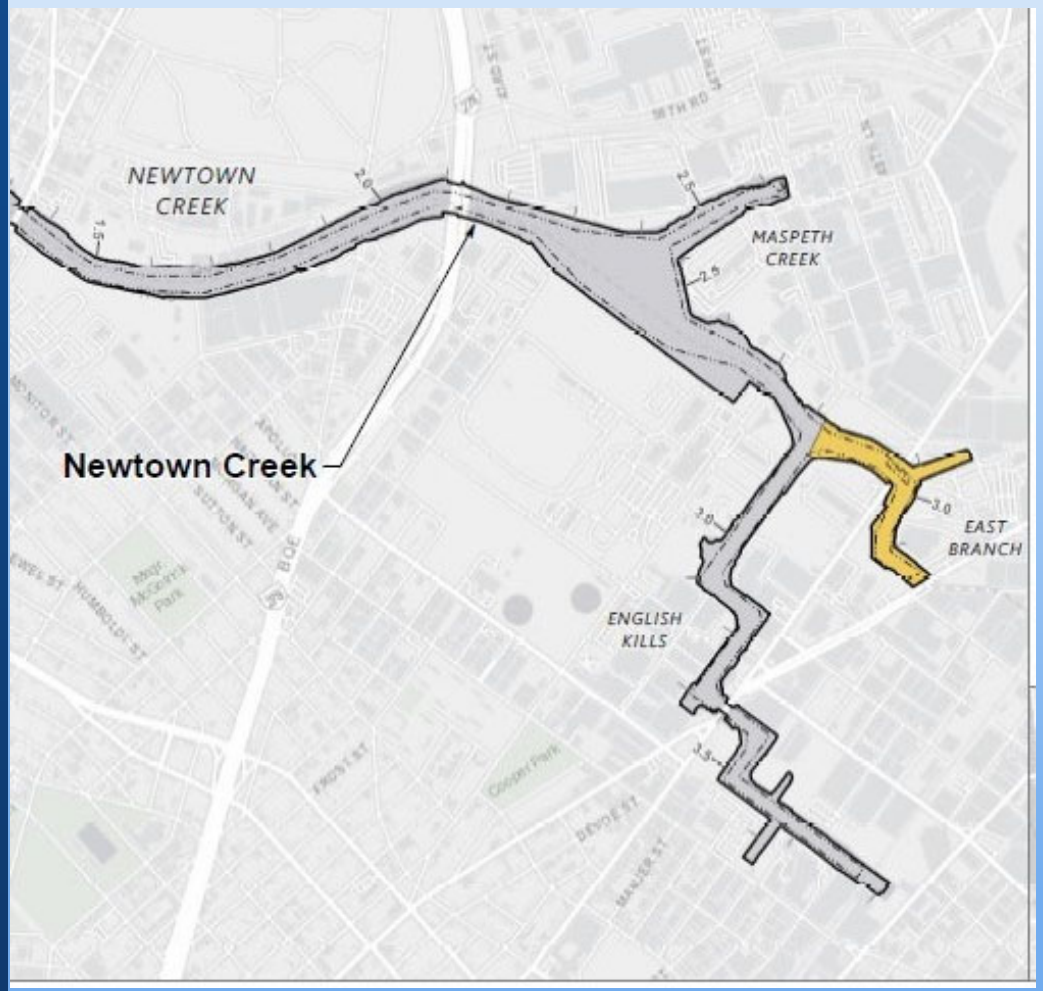
BB-009
BB-040
BB-010
BB-004
BB-042
BB-011
BB-012
BB-013
BB-043
NCB-022
NCB-021
BB-014
BB-015
NCB-023
NCB-024
NCB-002
NCQ-029
NCB-019
NCB-015
DUTCH KILLS
NEWTOWN CREEK
WHALE CREEK
MASPETH CREEK
EAST BRANCH
ENGLISH KILLS
EAST RIVER
CALVARY CEMETERY
Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
CSO Discharge
WWTP Effluent Overflow

East Branch Early Action Study Area



- Tributary of Newtown Creek
- Approximately 0.5 miles in length
- Surface area ~11 acres
- Depth 10.3-16.5 ft in channel and shallower at head of tributaries
- Extensive investigations completed as part of the Remedial Investigation/Feasibility Study Process
- Focused Feasibility Study (FFS) was developed to evaluate remedial alternatives for the East Branch

*Additional detail on the rationale for conducting the East Branch Early Action can be found in a June 20, 2023 presentation to the CAG (available on the CAG website).

Recap from April CAG meeting….

- We said that at the May meeting we would provide more details on:
  - The cleanup alternatives evaluated in the Draft Focused Feasibility Study, which is still under review
  - The pre-design investigation (under development)
  - The post-implementation evaluation monitoring plan (under development)
- This summer, we plan to release the Proposed Plan for public comment, along with the Revised Draft Final Focused Feasibility Study
- We will work with the CAG leadership to assure all technical review supports are in place prior to release of the Proposed Plan

Common Elements of Each Active Alternative

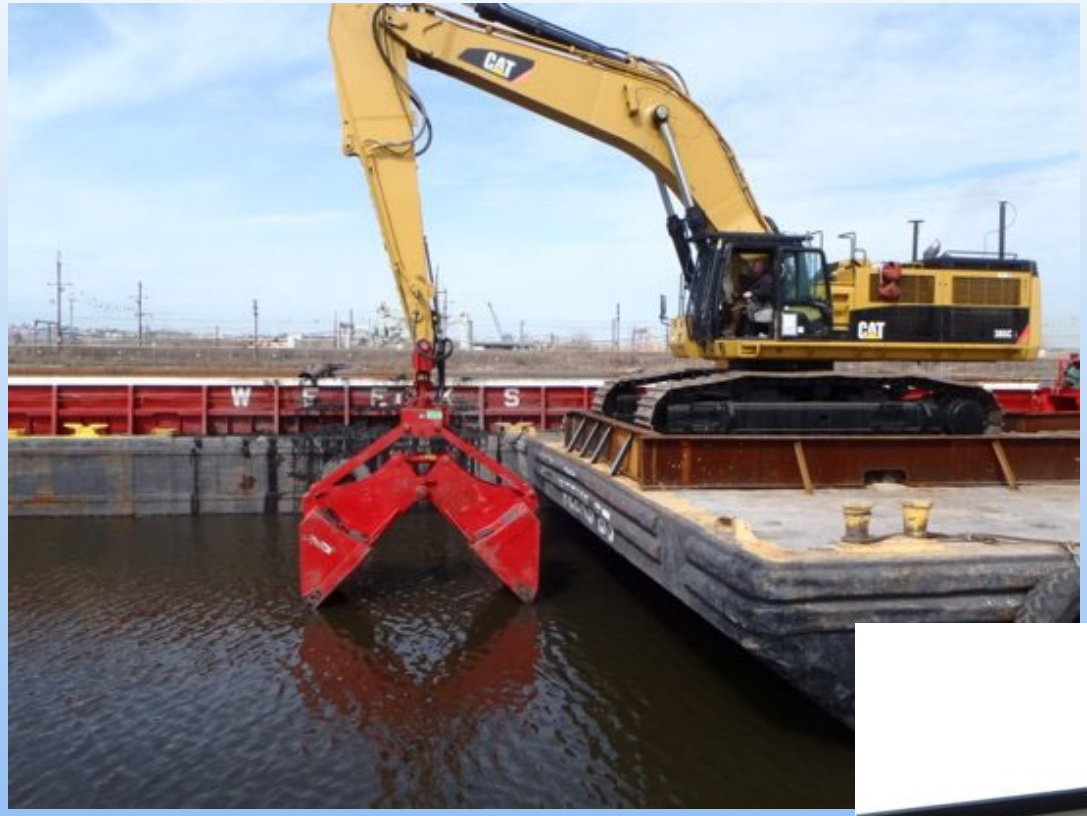
- Robust pre-design investigation
- Dredging
- Capping
- In-situ stabilization
  - where needed to reduce migration, to treat NAPL
- Sealed bulkheads
  - where needed to reduce migration, as a temporary measure to address seeps while upland cleanup measures are evaluated and implemented
- Stabilization measures
- Dredged material management
- Institutional controls
- Evaluation monitoring
  - This is key!!

Key Terminology: Pre-Design Investigation

- A preliminary-design investigation (PDI) involves collecting additional information to support the remedial design
- The PDI will include at least the following:
  - Additional sediment sampling to refine the delineation of contaminants of concern (COCs) in sediment;
  - Additional porewater and/or groundwater COC data collection, primarily to refine cap designs;
  - Data collection to further delineate NAPL and investigate NAPL mobility;
  - Geotechnical data collection to support dredge design, cap design and shoreline stability evaluations;
  - Investigations to inform decisions on the need for upland controls.
- Will also be used to help develop the long-term evaluation monitoring program.

Key Terminology: Dredging

- Sediment removal, aka dredging, removes contaminated sediment from aquatic settings.
- Common types of dredging:
  - Mechanical
    - Uses an excavator or other heavy equipment to remove sediment
    - Usually situated on a barge
    - Clamshell or enclosed bucket
  - Hydraulic
    - Cutterhead
    - Horizontal auger
  - Specialty
    - Suction-vacuum dredge
    - Better for small-scale areas



Mechanical Dredging

Key Terminology: Armored and Amended Cap

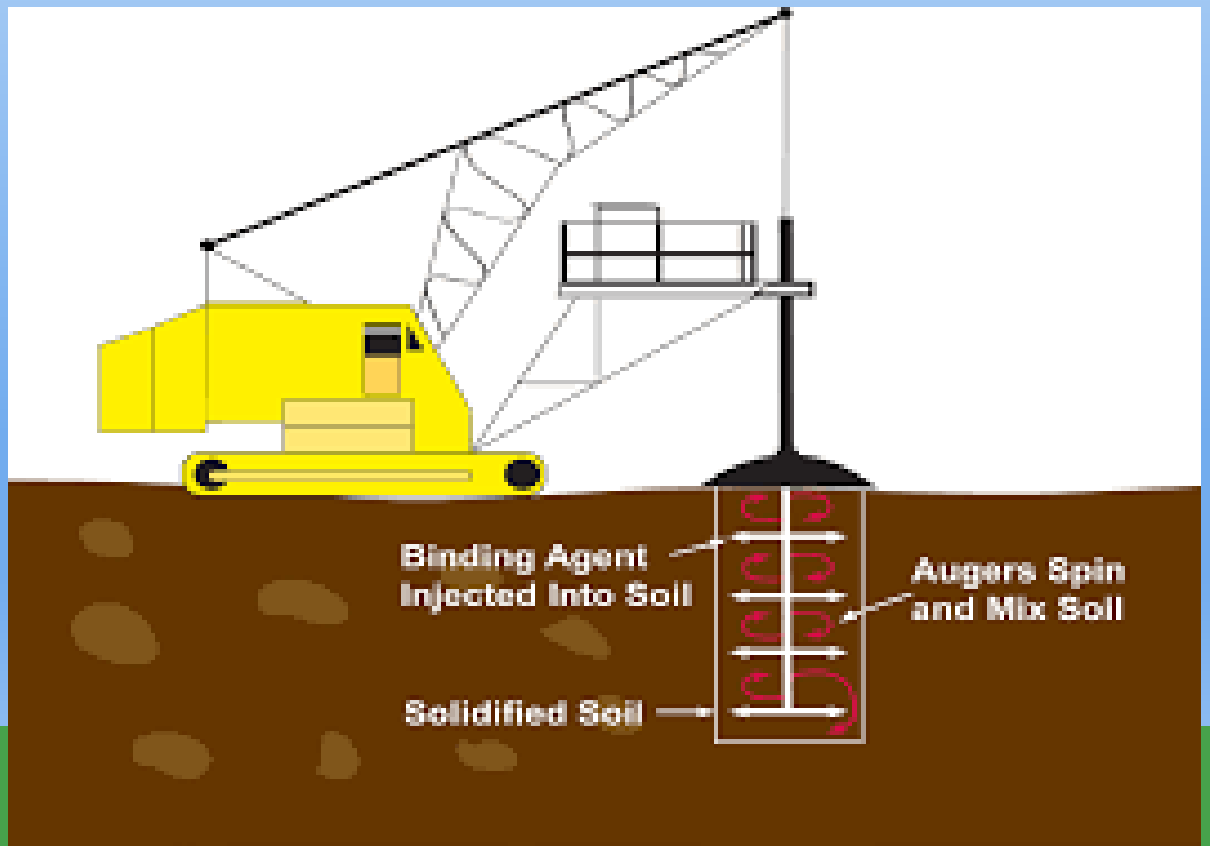
General example of a multi-layer armored and amended cap

Key Terminology: Dredged Material Management

- Tentative plan is as follows:
  - Dredged material will be loaded into scows
  - The material will be transported to a commercially available upland processing facility.
  - Water that settles out from the sediment will be treated on the barge using a treatment system.
  - Dewatered dredged material would be offloaded at the regional sediment processing facility for additional management and stabilization, as needed.
  - Sediment will be sent for final offsite disposition.

Key Terminology: In-Situ Stabilization

- In-situ stabilization (ISS) is a method that can be used to prevent or slow the release of contaminants from sediment
- The process involves mixing or injecting solidification agents or chemical reagents (e.g., Portland cement) to solidify, stabilize, and immobilize contaminants in sediment.



Key Terminology: Bulkheads/Sealed Bulkheads

- Bulkheads
  - Man-made structures used to reduce shoreline erosion or stabilize shorelines. Commonly made of steel sheet piles, wood, concrete, or similar materials
- Sealed bulkheads
  - A type of bulkhead used to prevent contamination from entering the creek from upland properties. Typically uses interlocking joints of sheet pile wall

Alternatives Evaluated

Alternative	Alternative Summary
Alternative EB-A	No Action
Alternative EB-B	**Dredge to Allow Placement of Cap at or Below 0 Foot MLLW:** Dredge sediments down to a specified elevation to facilitate placement of an armored/amended cap entirely at (or below) 0 foot MLLW, which would decrease water depths.
Alternative EB-C	**Dredge to Allow Placement of Cap to Maintain Existing Water Depth:** Dredge sediment to a minimum depth to accommodate placement of an armored/amended cap to maintain the existing water depth.
Alternative EB-D	**Dredge to Allow Placement of Cap to Maintain Existing Water Depth with Localized Deeper Dredging:** Dredge sediment to a minimum depth to accommodate placement of an armored/amended cap to maintain the existing water depth. In select areas, sediment would be dredged deeper considering the depth to uncontaminated materials, COC concentrations in sediment, potential for upward NAPL migration from the deeper soft and/or native sediment.
Alternative EB-E	**Dredge All Within Navigation Channel, Cap Outside:** Dredge the federally authorized navigation channel to a depth necessary to accommodate a cap below the current authorized depth plus a buffer or to native material, whichever is shallower.
Alternative EB-F	**Dredge All:** Dredge all sediments to uncontaminated materials (e.g., uncontaminated native material) and backfill if necessary.

Alternative EB-B

- Dredging where necessary to allow for placement of an armored and amended cap
  - Cap would be placed entirely at or below the mean low water line
  - Thickness of cap would range from 3 to 4.5 feet
- On average, would raise the elevation of the sediment bed
- EB-B would remove ~32,300 cubic yards of sediment over 3.5 acres
- Estimated Total Cost: $171.1 million
- Scow trips: More than 60
- Construction timeframe: 2 years

Alternative EB-C

- Dredging to an average depth of 3 feet across the entire footprint of the East Branch to allow for placement of an armored and/or amended cap
  - Existing water depth would be maintained
  - Thickness of cap would range from 3 to 4.5 feet
- EB-C would remove more than 90,000 cubic yards of sediment over approximately 11.2 acres
- Total Cost: $263.1 million
- Scow trips: More than 100
- Construction timeframe: 2.5 years

Alternative EB-D

- Dredging to an average depth of 3 feet across the entire footprint of the East Branch to allow for placement of an armored and amended cap, with localized deeper dredging where needed based on the remaining depth to uncontaminated material, contaminant concentrations in remaining sediment, potential for exposure to principal threat waste and the potential for upward migration of NAPL.
  - Existing water depth would be maintained
  - Thickness of armored and amended cap would range from 2.5 to 4.5 feet
  - Additional backfill would be needed to maintain water depths
- EB-D would remove more than 100,000 cubic yards of sediment over approximately 11.2 acres
- Total Cost: $268.8 million
- Scow trips: More than 110
- Construction timeframe: 2.5 years

Alternative EB-E

- Dredge the federally authorized navigation channel to a depth necessary to accommodate a cap below the current authorized depth plus a buffer or to native material, whichever is shallower.
  - Areas dredged to native material would be backfilled as necessary
  - Dredging and/or capping outside the navigation channel, including the Western Beef Slip or in areas with high flux of COCs from groundwater
  - Thickness of armored and amended cap to be determined
  - Would result in deeper water depths on average
- Included as an alternative since the navigation channel has not been deauthorized
- EB-E would remove ~233,800 cubic yards of sediment over 10.6 acres
- Total Cost: $483.5 million
- Scow trips: More than 175
- Construction timeframe: 4 years

Alternative EB-F

- Dredge down to uncontaminated material across entire footprint of the East Branch and backfill as needed
  - Armored and/or amended capping would be placed in areas with high flux of COCs from groundwater
  - Would result in deeper water depths on average
- EB-F would remove ~254,700 cubic yards of sediment over 11.2 acres
- Total Cost: $592.1 million
- Scow trips: More than 190
- Construction timeframe: 5 years

Post-Implementation Evaluation Program

- Two goals
  - Determine if in-creek remedy is functioning as designed
  - Determine if Remedial Action Objectives are being met
- Provides process for evaluating these questions and, where necessary, taking additional remedial action
- Structured so that potential impacts to the protectiveness of the remedy are addressed as soon as possible

➢ This is a critical aspect of whatever alternative is selected

Evaluation Monitoring Approach

- Set long-term goal for cleanup to risk-based cleanup standards
  - These are expected to be met immediately following cleanup
- Determine Interim Evaluation Measures based on empirical data from surrounding upland inputs
- Develop a long-term monitoring program to:
  - Monitor the performance of the in-creek portion of remedy
  - Evaluate the progress towards meeting the Remedial Action Objectives in the long-term
  - Include sampling of at least sediment, surface water, and external sources of contamination, plus regular bank inspections, for both erosion and seeps, with sampling as needed/appropriate.
- Take additional source control actions, if needed and on an ongoing basis
  - Either through State and/or Federal enforcement authority, to be decided on a case-by-case basis

OVERVIEW OF DATA

SOME FIGURES FROM THE DRAFT FOCUSED FEASIBILITY STUDY

Sediment Thickness Above Native Layer

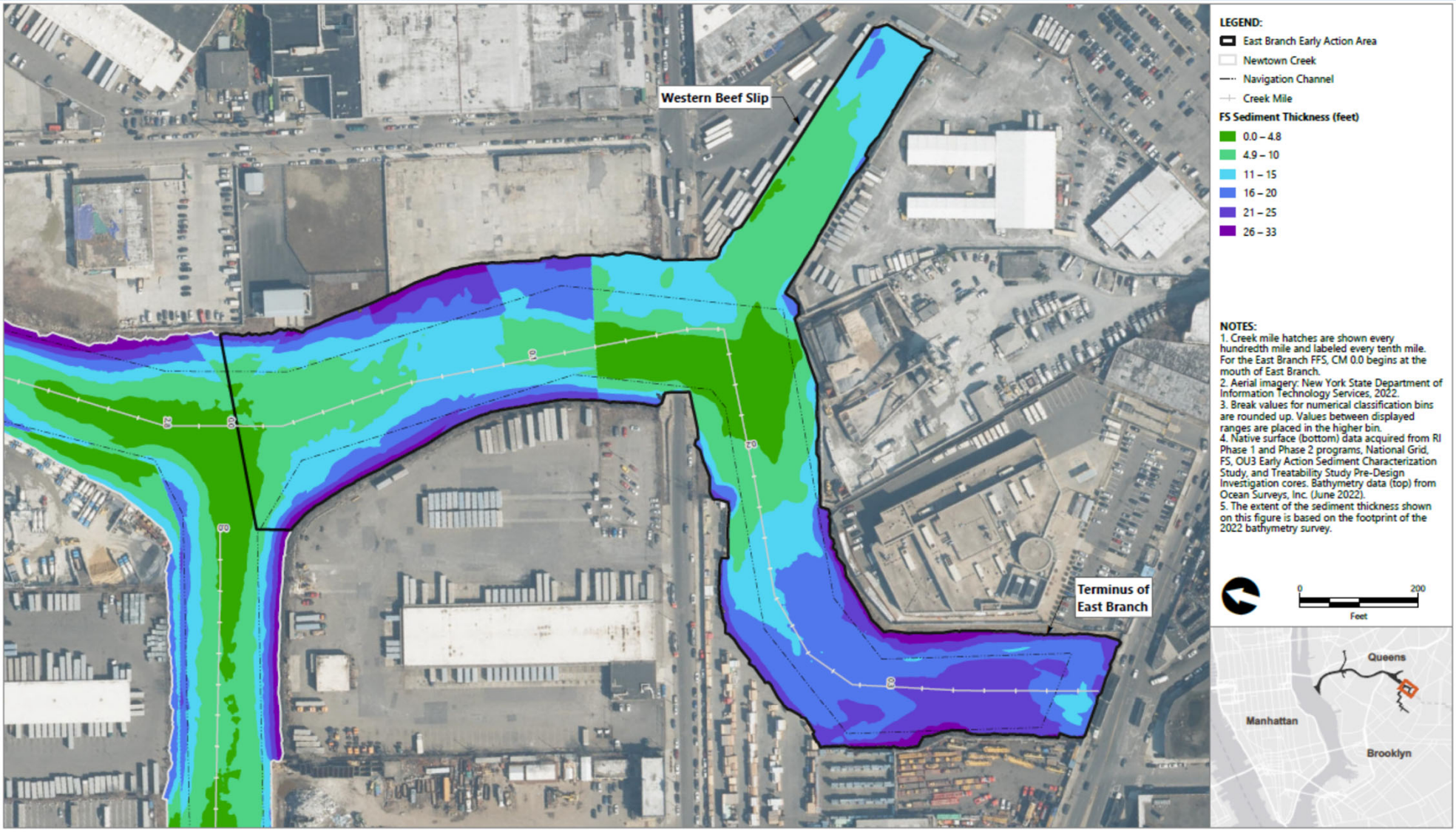


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Figure A2-4
Sediment Thickness
Conceptual Site Model
Newtown Creek RI/FS

Water Depth Zones

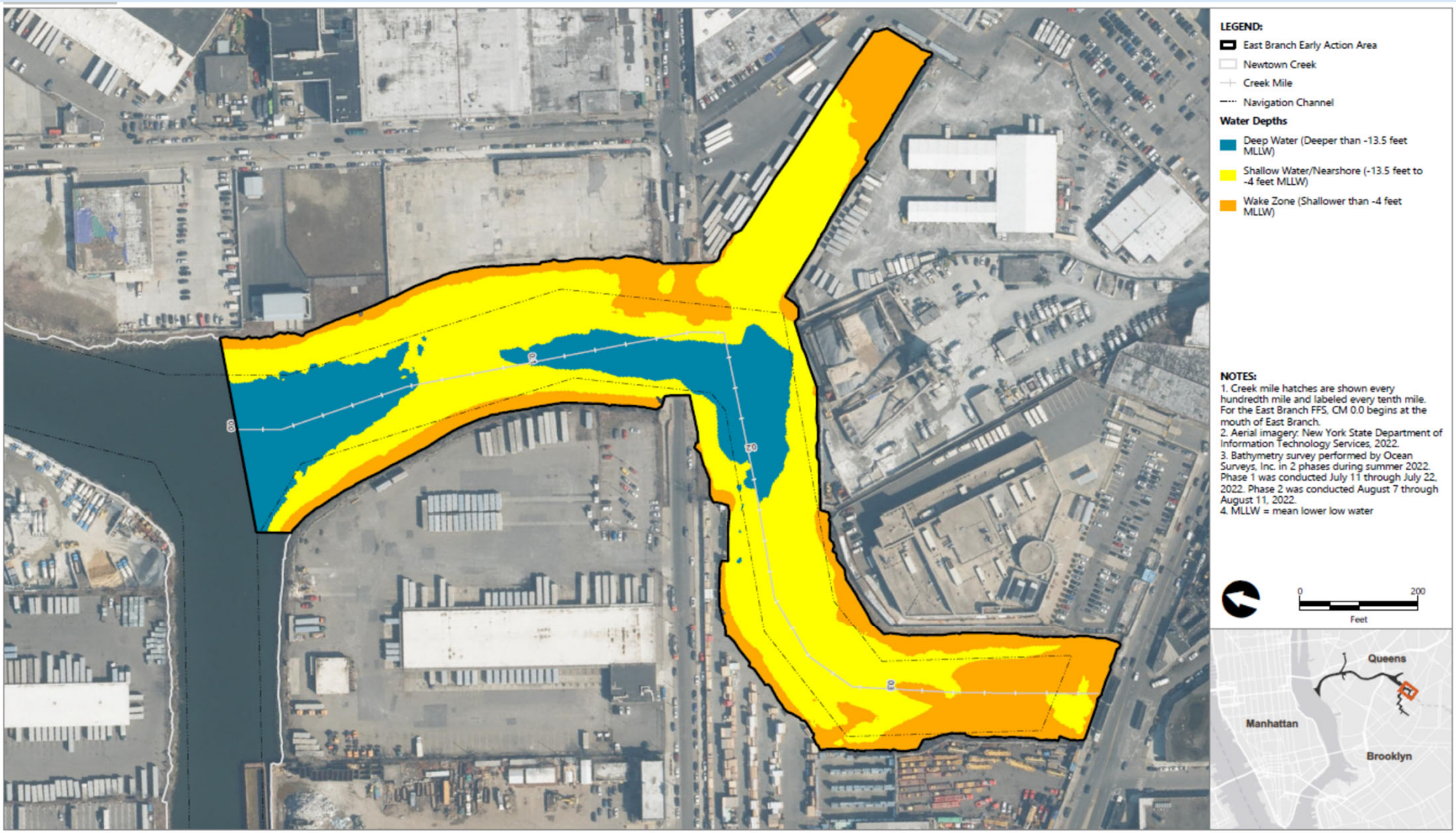

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Figure 5-8
Water Depth Zones for Capping Evaluations
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

TPAH(34) Risk Based PRG Exceedances Surface Sediment

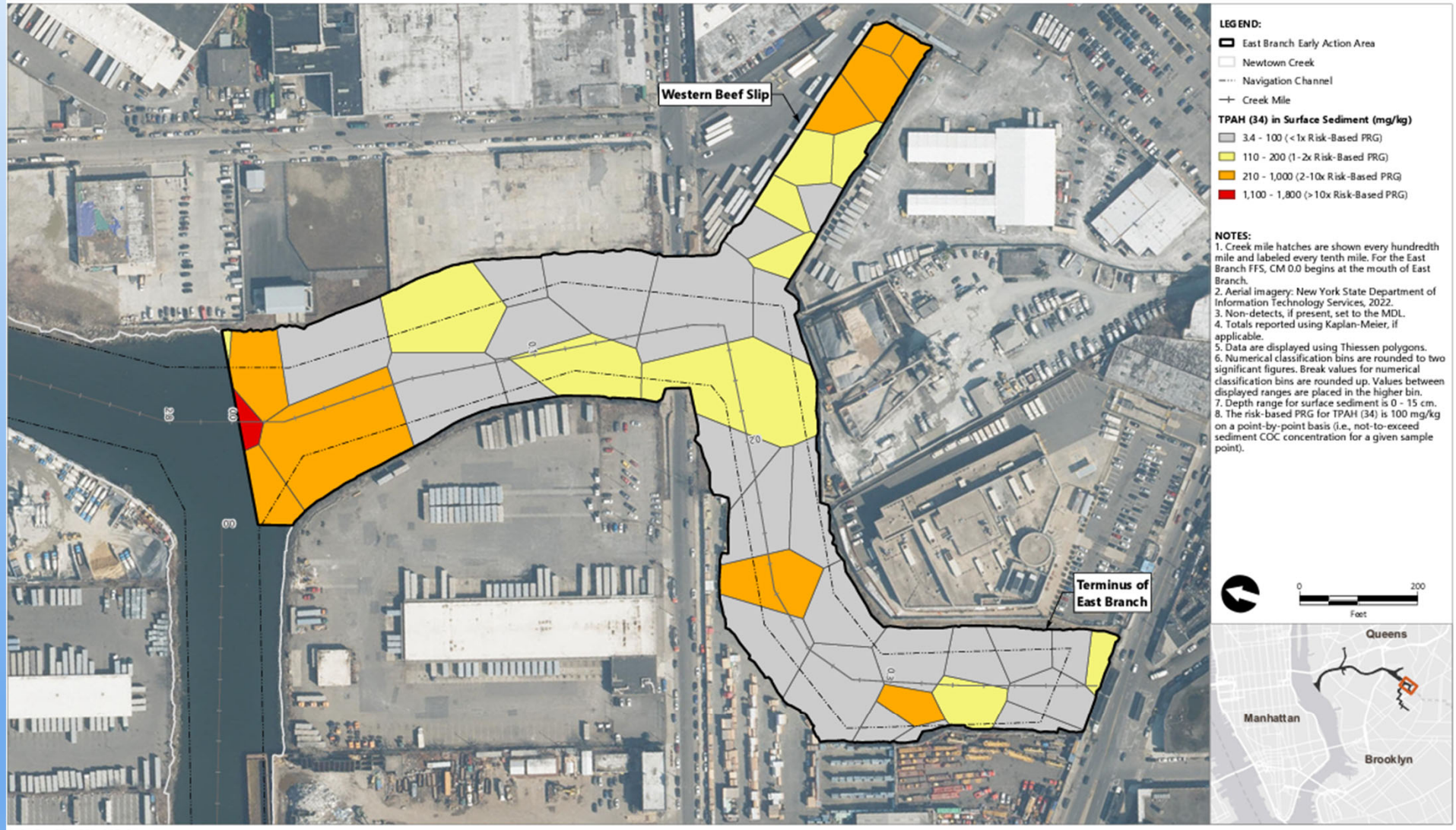

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Figure 3-1
TPAH (34) Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Total PCB Risk Based PRG Exceedances Surface Sediment

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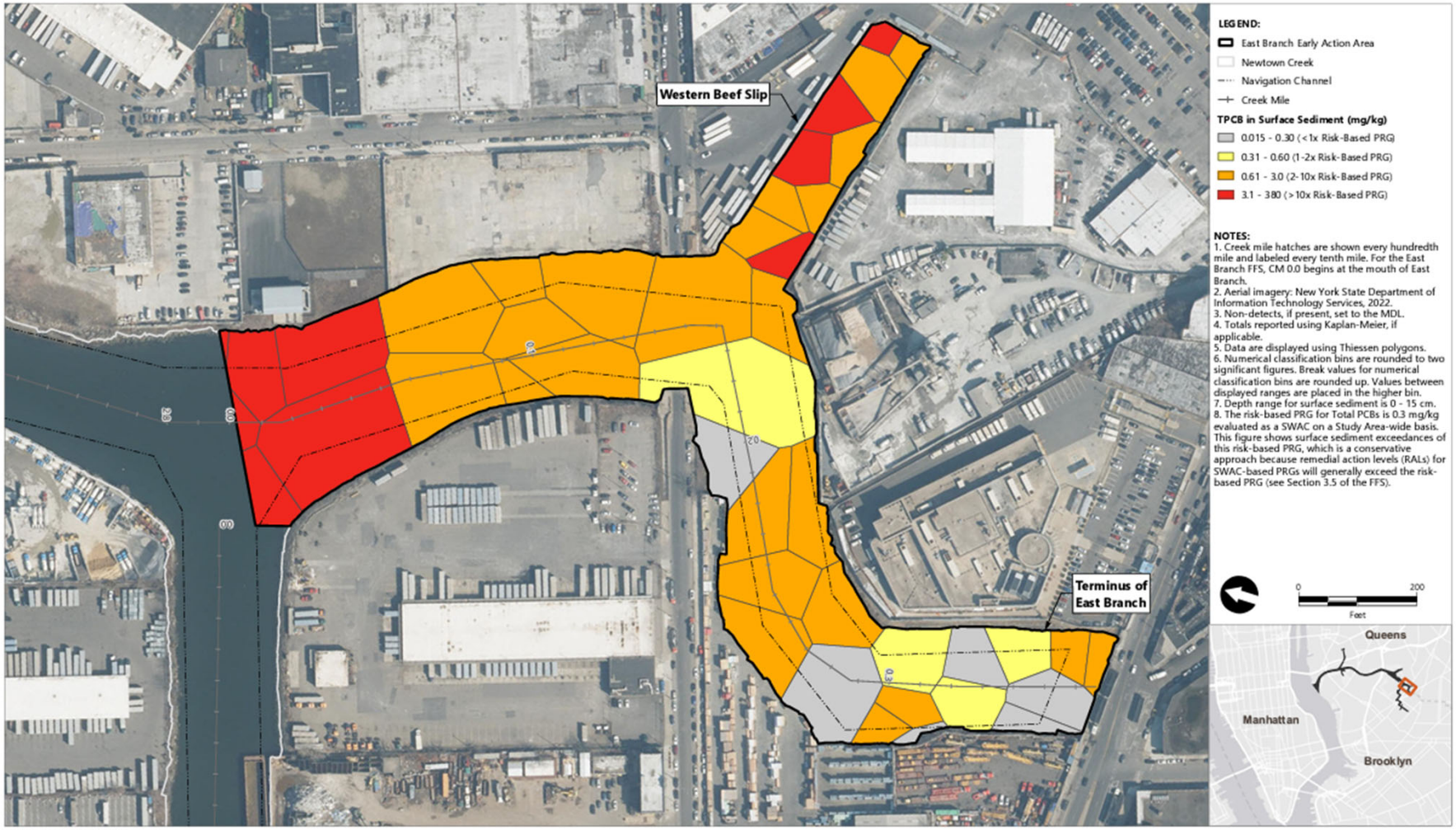

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Figure 3-3
TPCB Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Copper Risk-Based PRG Exceedances Surface Sediment

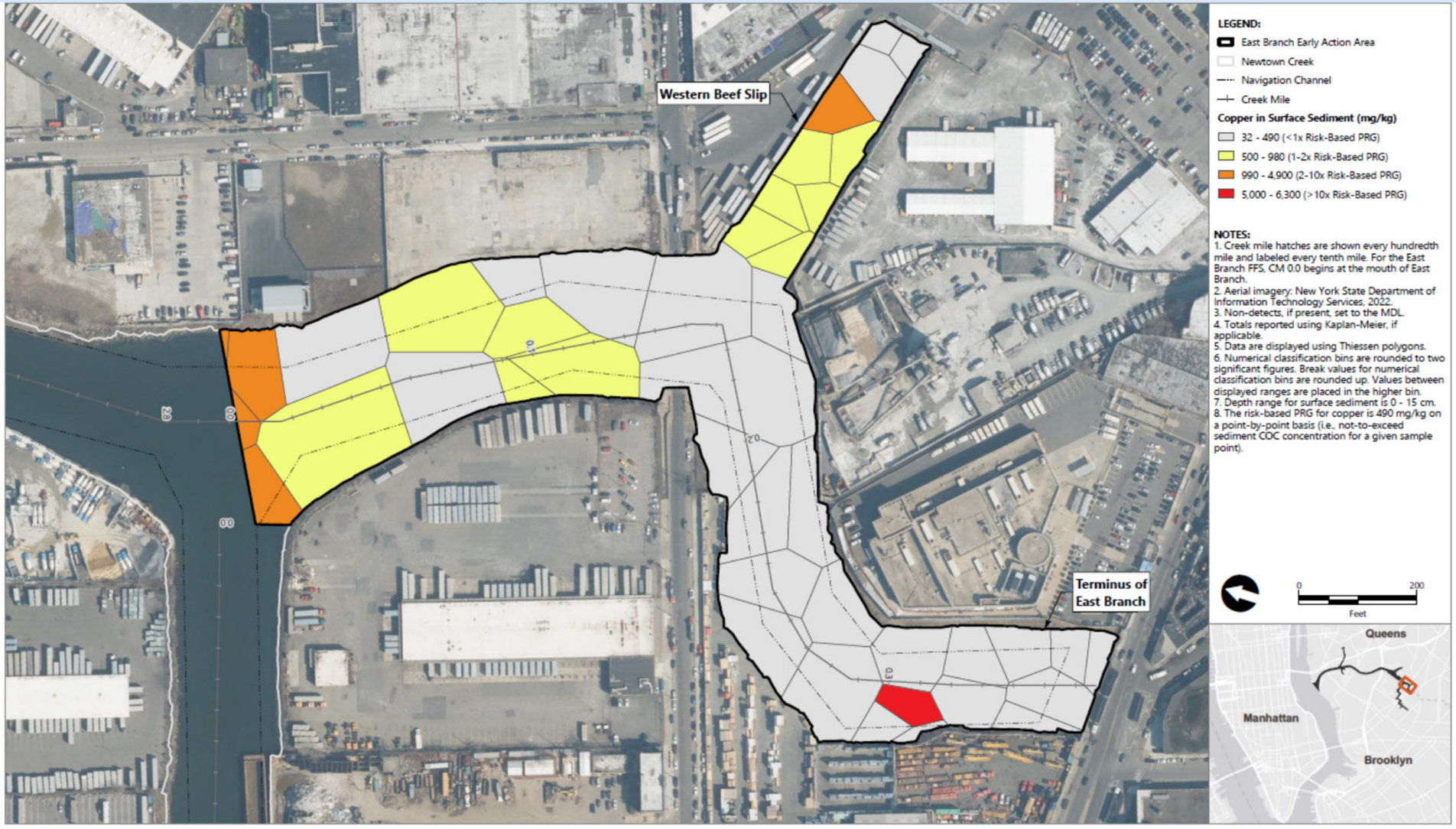

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Figure 3-5
Copper Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

C19-C36 Risk Based PRG Exceedances Surface Sediment

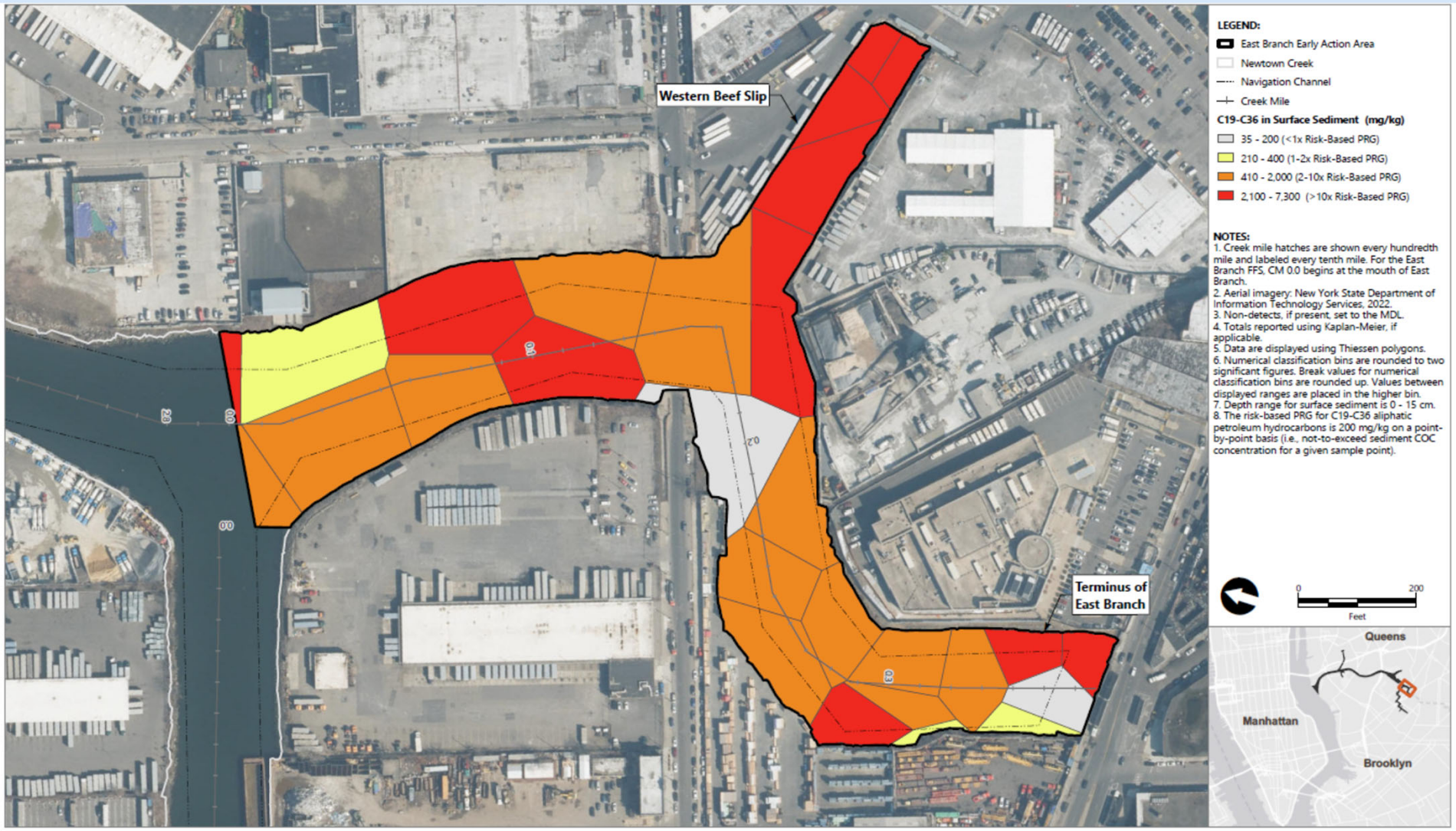

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Figure 3-2
C19-C36 Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Dioxin/Furan TEQ Risk Based PRG Exceedances Surface Sediment

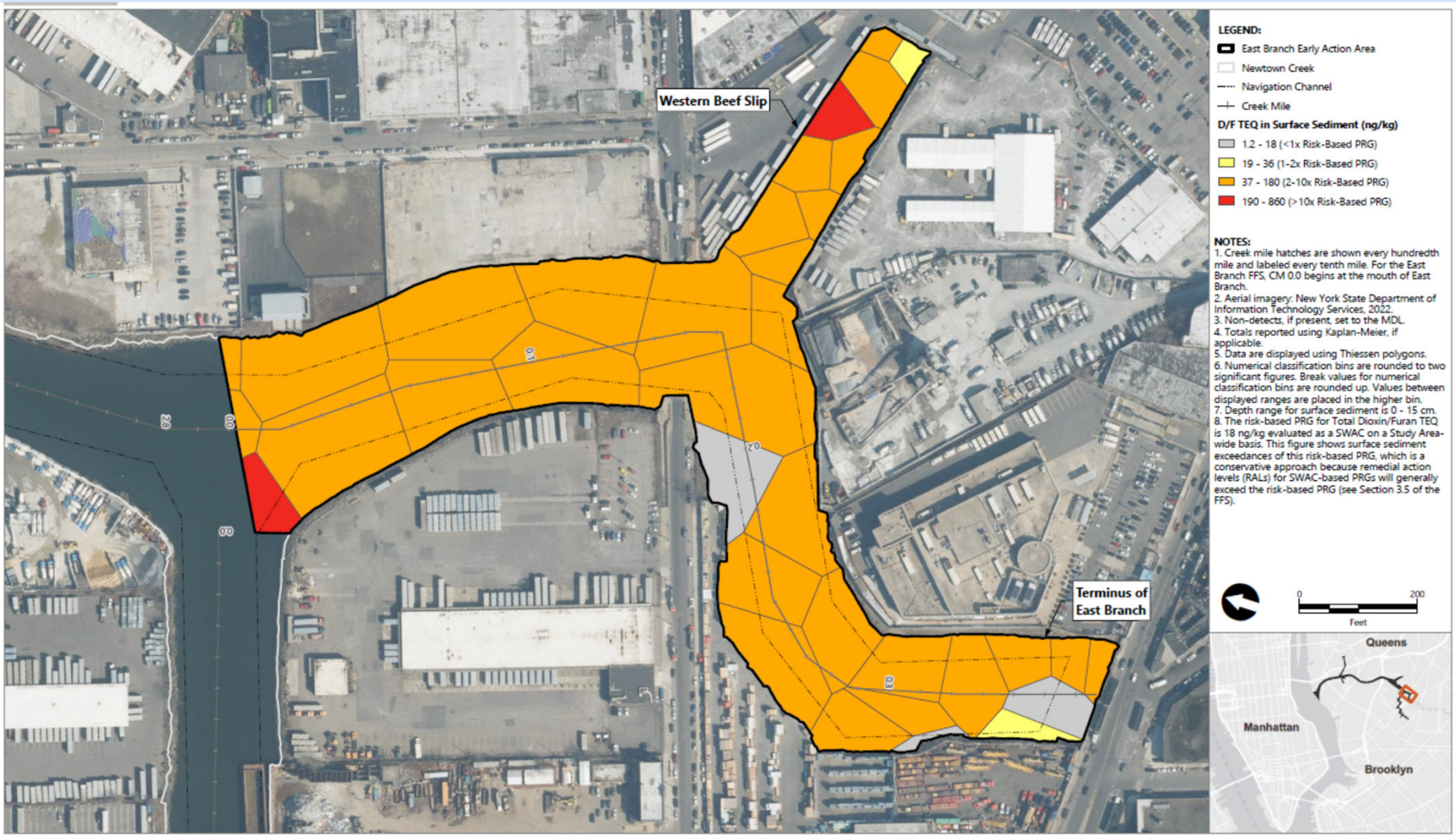

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Figure 3-4
D/F TEQ Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

All Contaminant of Concern Risk-Based PRG Exceedances – Surface Sediment

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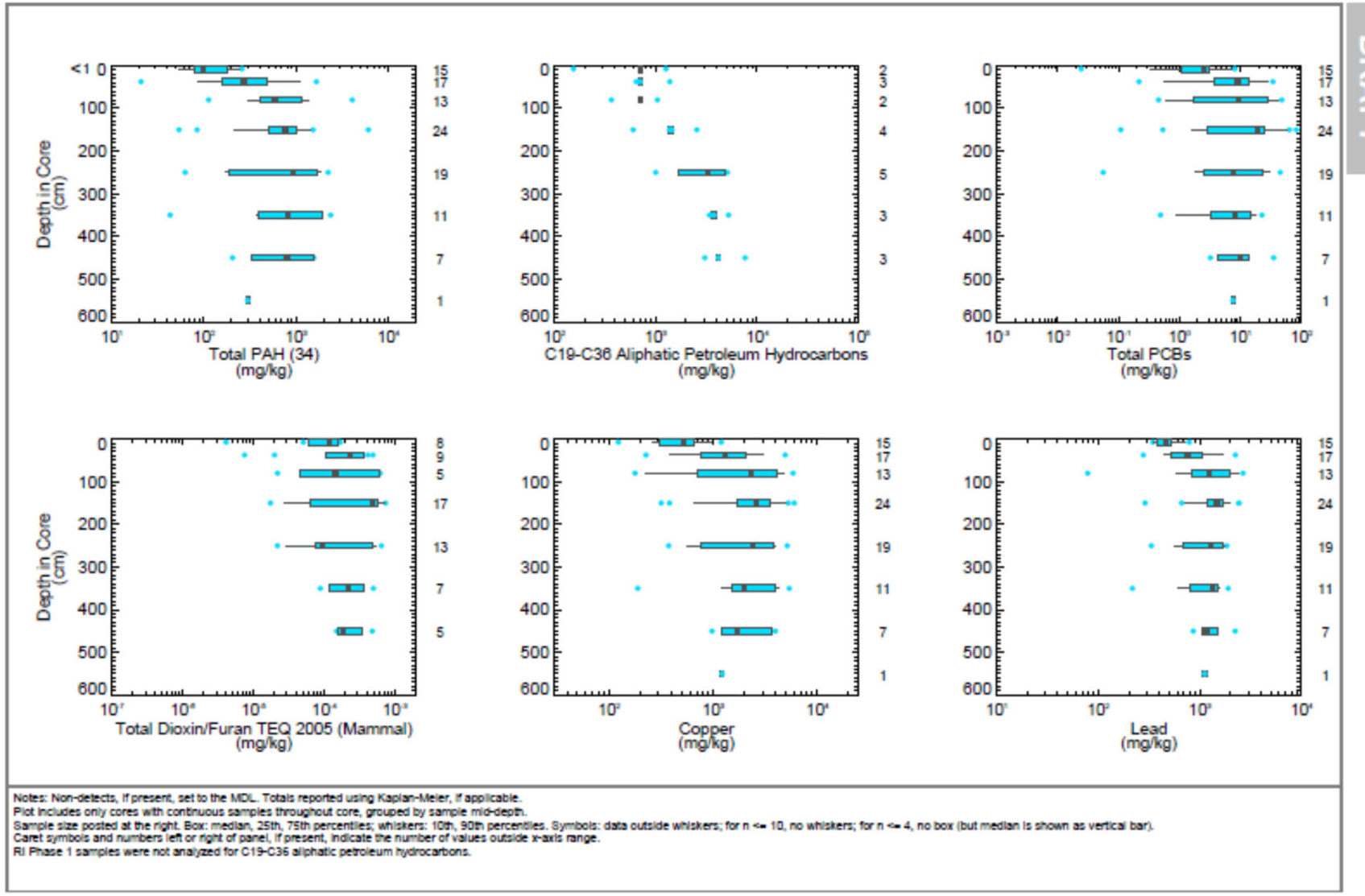
Figure 3-7
Maximum Risk-Based PRG Exceedances in Surface Sediment for All COCs
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Surface and Subsurface Sediment Concentrations



Notes: Non-detects, if present, set to the MDL. Totals reported using Kaplan-Meier, if applicable.
Plot includes only cores with continuous samples throughout core, grouped by sample mid-depth.
Sample size posted at the right. Box: median, 25th, 75th percentiles; whiskers: 10th, 90th percentiles. Symbols: data outside whiskers; for n <= 10, no whiskers; for n <= 4, no box (but median is shown as vertical bar).
Caret symbols and numbers left or right of panel, if present, indicate the number of values outside x-axis range.
RI Phase 1 samples were not analyzed for C19-C36 aliphatic petroleum hydrocarbons.

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Figure A2-8

Surface Sediment and Subsurface Sediment Concentrations in East Branch - Box Plots by Depth

Conceptual Site Model
Newtown Creek RI/FS

TPAH(34) Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment

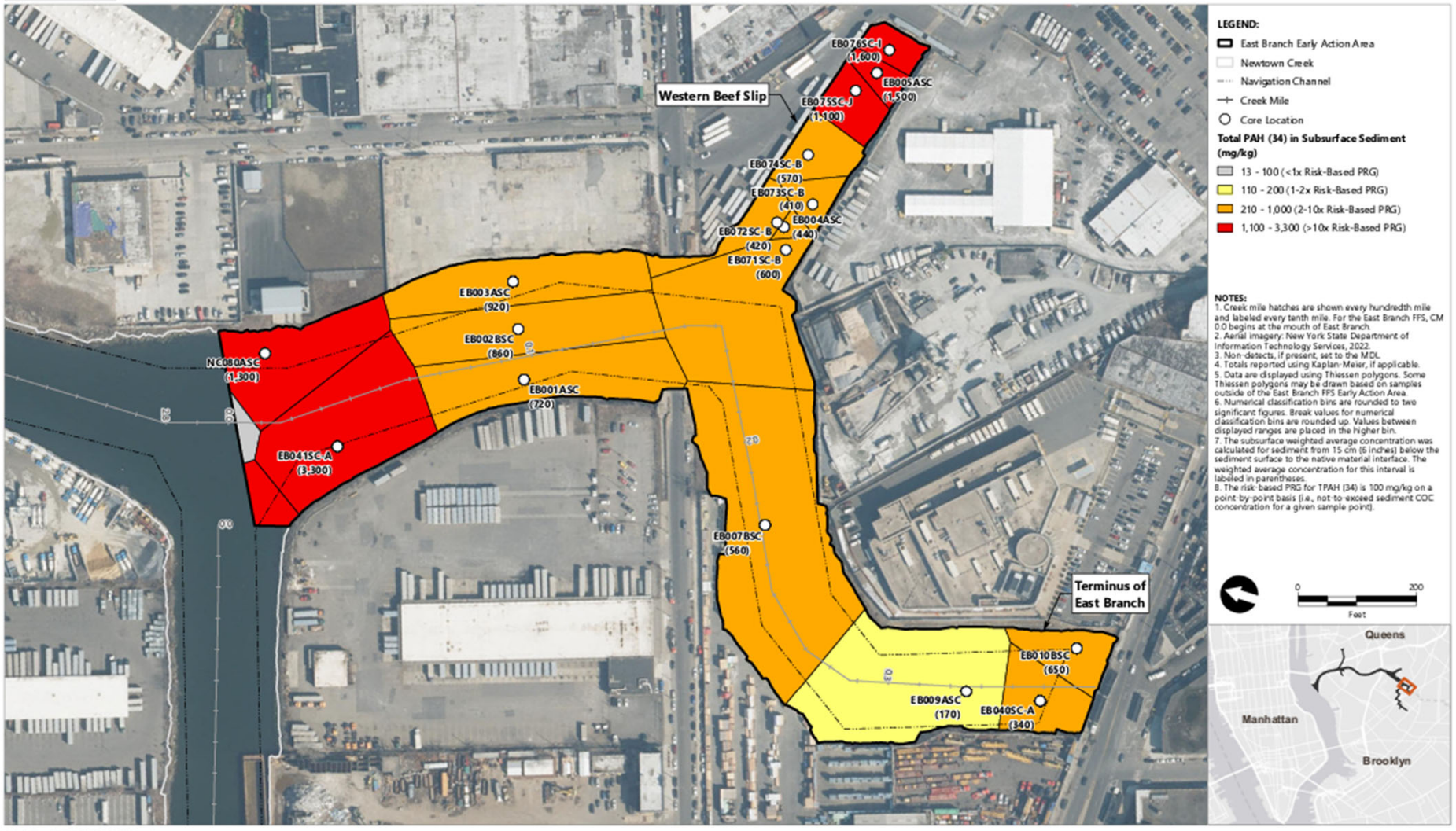

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Figure A2-9a
Total PAH (34) Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Total PCBs Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment

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Figure A2-9c
Total PCBs Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Copper Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment

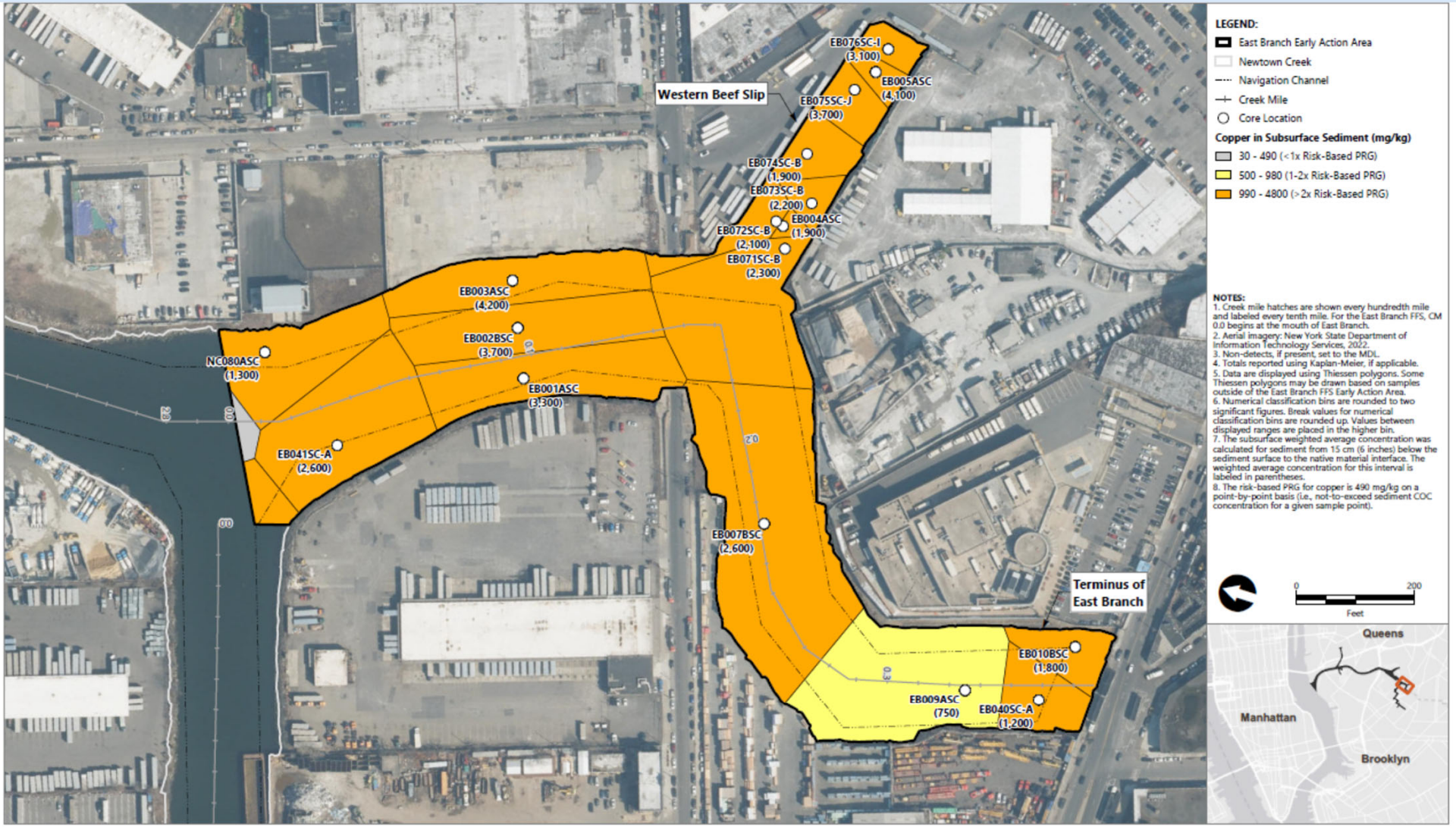

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Figure A2-9e
Copper Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

C19-C36 Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment

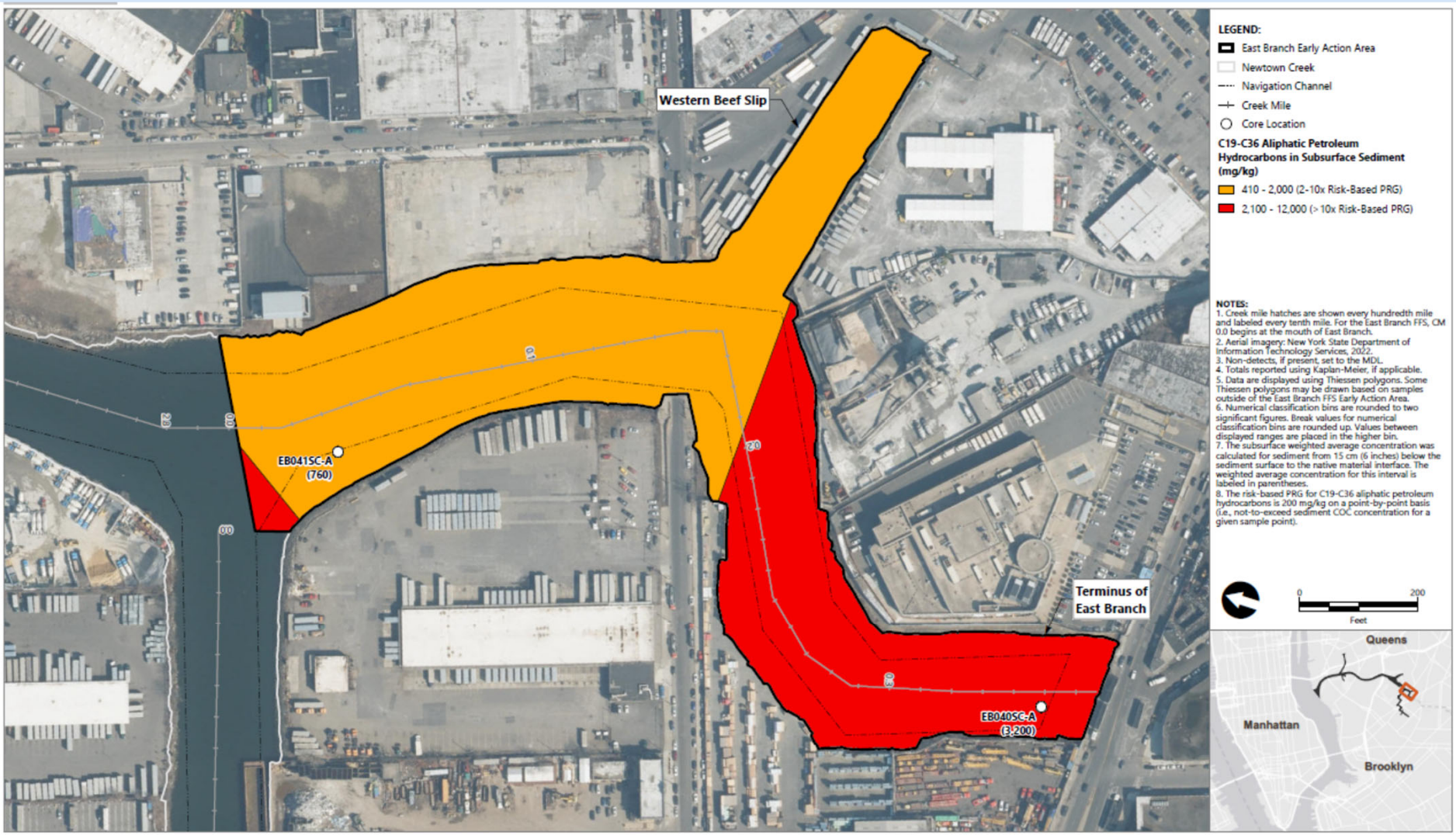

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Figure A2-9b
C19-C36 Aliphatic Petroleum Hydrocarbon Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Dioxin/Furan TEQ Risk Based PRG Exceedances Depth Weighted Average Subsurface Sediment

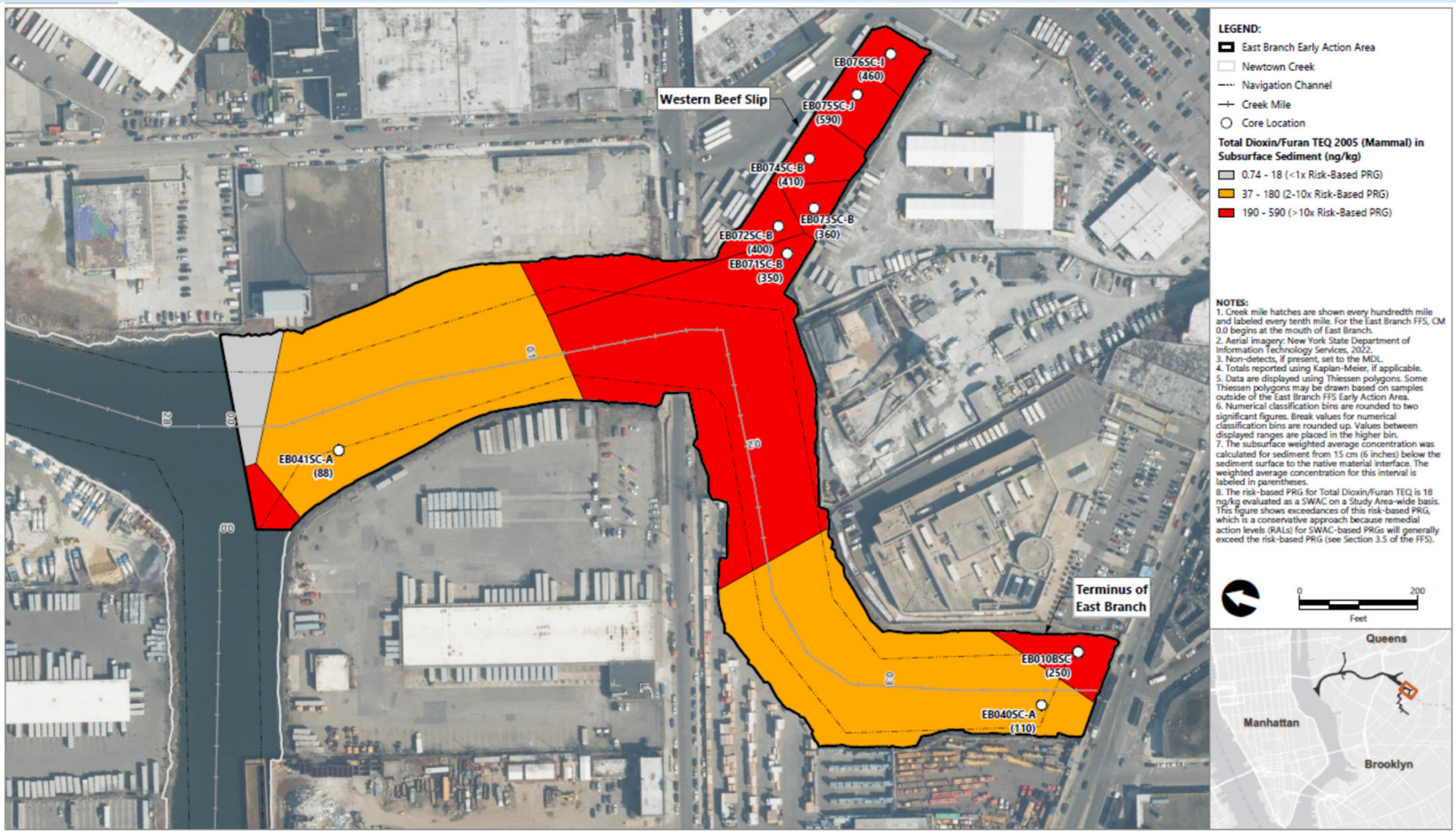

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Figure A2-9d
Total Dioxin/Furan TEQ 2005 (Mammal) Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Most Notable Observations of NAPL Surface Sediment

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Figure A2-10a
Most Notable NAPL Observations in Surface Sediment
Conceptual Site Model
Newtown Creek RI/FS

Most Notable Observations of NAPL Subsurface Sediment

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Figure A2-10b
Most Notable NAPL Observations in Subsurface Sediment
Conceptual Site Model
Newtown Creek RI/FS

Ebullition Associated Sheens

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Figure A2-16
Maximum Spatial Extent of Gas Ebullition Associated Dynamic Sheens
Conceptual Site Model
Newtown Creek RI/FS

Questions?